

The background of the cover is a photograph of a recording studio. In the center, a desk holds a computer monitor displaying a software interface, a keyboard, and a mouse. To the left of the desk is a large, black, floor-standing speaker with a yellow tweeter. To the right is another similar speaker. The walls are covered in wood paneling and red acoustic foam. The overall lighting is warm and focused on the desk area.

MASSIVE  **MASTERING**

MASTERING: Getting the Most out of Your Mix

**Sensible Suggestions and
Common Mixing Mistakes
to Avoid in the Studio**

John Scrip

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MASSIVE MASTERING

MASTERING: Getting the Most out of Your Mix

By John Scrip

PREFACE:

This booklet is a montage of thoughts and ideas taken from the everyday experience of a mastering engineer. The audio recording industry has drastically changed over the past generation. There are *thousands* of home, basement and project studios that offer "all-in-one" services to their clients. While this may not be all bad, it is not "usually" the way to go.

This booklet attempts to explain some of the reasons why a dedicated mastering service is still usually the artist's best bet. Furthermore, it touches on several misconceptions about recording and mixing, and how to work through them.

As many novice bands and engineers have never had a recording properly mastered, this guide includes several ideas in a "DO" and "DON'T" format that can take the "potential" of their recording much further than trying to "do it all at once."

Do I have a stake in this? Sure I do. I'd love to convince everyone to send me their mixes. However, no matter where you choose to have your project mastered, these are some guidelines that I wish ALL of my clients followed.

Mastering is an art form that is quickly being swallowed and overshadowed by the "hot new program" or the new "amazing-izer" box. Any experienced engineer can tell you first-hand that mastering is MUCH more than the "latest thing" on the market, and that there is no substitute for experience and a solid mix as a foundation.

Much of the information in this booklet is taken from my RecTech articles (also by Davidson Publ., Inc.), my website, and my "rants" on some of the software and audio-related forums on the internet. I hope it comes in handy. Good luck in the studio!

- John Scrip

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Previously released as:

“MASSIVE MASTERING - Guide to MIXING for MASTERING”

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Mastering Changes:

MASTERING IN THE PROJECT STUDIO AGE:

With the current market of home, basement and "low rent" recording studios, professional mastering services have



never been more important. Recent technological advancements in recording have proven that most home & small project studios can put out solid work. A qualified mastering engineer can

then help to enhance and elevate the project to compete with the big boys.

Although most of the same guidelines apply to the analog realm, this booklet assumes that your recording will be mixed to a standard digital format (DAT, CD-R, etc.) at a pro, home or project studio. It also assumes that your final master will be a "Premaster" or "Production Master" CD, known as a PMCD for short (*"PMCD" is a term originally introduced by Sonic Solutions®*).

And yes, the "proper" name for this is "premastering" as the actual "master" disc is made at the replication plant. However, we'll just use the term "mastering" for our purposes.

If you're not completely familiar with the concept of digital audio mastering, the following pages should give you a good idea of some of the "do's" and "don'ts" during your studio session. Keeping these guidelines in mind can save you huge amounts of time and money in the studio AND give you a

better sounding production master to boot!

These are only guidelines - As you are probably well aware of, there are few hard rules when it comes to recording. Use your best judgment. That being said, knowledge IS power. So, read on...

What is Mastering?

A QUICK PRIMER:

Your mastering session is the final step - The ultimate hours of the assembly of your project. Edits made - Levels set - EQ tweaked - Stereo field adjusted - Fades established. Most importantly, by an unbiased set of ears and using equipment specialized for the task. Mastering is the last chance to get your project sounding as good as possible before manufacturing. It is in some sense "critically" one of the most important, and probably least understood link in the audio chain. Many mastering houses (MASSIVE Mastering included) use techniques that are just not feasible to duplicate during a mixing session. It's a LOT more than strapping a compressor and an EQ to a mix and calling it "mastered" at the output. But it's not a substitute for a good mix...

"Mastering isn't the 'car' - It's the paint. It's the chrome on the wheels. It's the detailing and the wax job. Your recording is the vehicle and mastering is the custom showroom finish that sets it apart from the others." - JS

Mastering a CD to RedBook standards is something that should be left to those with the proper experience and tools: It's not "rocket surgery" but many consumer CD recording programs may NOT produce a RedBook standard CD. And many bands have found out the hard way. Don't be one of


them! Get it done right! Pre-track pause times, BLER rates, all must be accounted for to meet RedBook specifications. Getting a non-compliant disc sent back from the plant eats a lot of time for an enthusiastic artist. With the proliferation of budget-friendly short-run CD duplicators that may NOT check for compliance, it's even more important to know that the production master you send in is up to specs.




Why Master Anyway?

MISTAKE NUMBER ONE - TRYING TO MASTER DURING YOUR MIXING SESSION:

This is one of the most common mistakes in the industry. Especially the "new generation" of home & hobbyist engineers. If you're just looking to put out a quick demo to get some gigs or to pass to your buddies, then by all means, go for it. If you're trying to put out a "pro" quality recording, do what the pro's do. Send it to a qualified mastering house. Here's just a few reasons why...

-  Most importantly, no studio is perfect. No engineer is perfect. Studios do what they do because they're good at it. Mastering engineers do what they do because they're good at it. Would you call a radio repairman to fix your TV set? Sure, he can "probably" fix it, but if you can call in a specialist, you've got the right person for the job.

-  Let's say that you're at a studio that has "dull" sounding monitors. When you record, the engineer is probably going to add some highs to everything to compensate. During mixdown, more highs will be added. Do you want to master in the same place and have even MORE highs added? Same with low end. It builds up fast. Pick a

frequency and compensate for it three times what you need. I think you get the picture...

- 👤 Look at ANY major release: Recorded At, Mixed At, Mastered At... The professionals know that certain people and places are better at certain things. They also know



that there are serious benefits to having a second and third set of ears on a project. It's very easy to get "too close" to a project. In most cases, you either settle in and

"everything sounds wonderful," or you get all crazy and NOTHING sounds right. Having someone that is "distant" from a project can be a huge help. Especially if he specializes in the "big picture" AND the tiny details without being so attached to the recording as a whole. This fresh perspective can be one of the most important advantages to having your project professionally mastered.

- 👤 If a project is "mastered" during mixdown, you're pretty much stuck with it. If it was compressed across the main bus to make it sound louder, it's impossible to undo. If it was run through one of several popular "mastering" processors or harmonic enhancers, that may severely limit any further processing. If you take it home and find that it sounds distorted or boomy or dull, it's normally too late to fix it.
- 👤 Think of it this way: Your mastering engineer has specialized tools, equipment and techniques for the job.

The monitors in most mastering studios don't sound like the monitors in most recording studios. If *everyone* had studio monitors in their homes and cars, it might be a different story.

Many don't think about these simple basics — A recording engineer specializes in getting the best sound of instruments and vocals recorded to tape (or disk, etc.).


A mixing engineer specializes in taking several, to several dozen tracks and combining them the best way he knows to holistically serve the mix.

A mastering engineer specializes in taking a set of finished mixes and tweaking them to holistically serve the project as a whole — Compiling the mixes together into a final production master while keeping a cohesive "feel" from track to track.

The Mixing Session:

THINGS TO CONCENTRATE ON - AND WHAT NOT TO CONCENTRATE ON DURING THE MIX:



 **DO** take advantage of mute groups and noise gates at the beginning and the end of a song. Effects processors, even good ones, can add noise that you might not want at the head of your song. Effects and other tracks

not in use on the very first note of a song should not be in the mix. If your drummer starts the song out with a hi-hat

or stick clicks, you don't want the reverb of those clicks to mask the first note either. Unless you want those clicks as part of the finished product, mute the effects just up to the first note. However, don't waste time trying to cue the DAT or CD recorder to start after the clicks - We'll just edit the clicks out later. At the end of the tune, whether it fades or has a "cold" stop, make sure that extra noise is kept down. On most "cold" stops, you can normally just hit "stop" on the deck (or, preferably, use a mute group on the console) and let the reverb you're using in the mix take over for the end. On a DAW, it's pretty similar. Edit the ends of all the active tracks to just stop cold, and let the reverb tail construct the end. On the other hand, if the song fades out, fade it "a little late" during mixing. The mastering engineer can redo the fade over the original fade to bring out any effect or board noise that occurs during the mix. NOISE IS YOUR ENEMY. A noisy mic preamp, hiss on a guitar track, a "whine" or RF (radio interference) from a bad connection - All of this will probably be EASIER to hear after mastering. Take good care to keep your tracks quiet! Some say "don't sweat the small stuff" - That's akin to "we'll fix it in the mix." Do yourself a favor and sweat the small stuff. HOWEVER:



DON'T waste hours of time in the studio trying to get a mix to sound "huge". Here's a little secret... Many recordings, especially those made on a limited budget, get that "huge" sound during the mastering session. I'm not saying to settle for less... Don't walk away with a mix that you're not happy with. Instead, start by trying to make your mix sound well balanced and well rounded. Nothing should "jump out" of it. The instruments should all sound "related" to each other. They should NOT step on each other. There shouldn't be irritating frequencies that spike up. A mix that sounds "a bit small" is a lot better than one

that sounds irritating. It will probably also have more potential during mastering.


- ③ **DO** compare your mix to some of your favorites. Keep in mind that the overall volume comes LATER, during mastering. Just listen to the overall tone and feel of the mix.
- ③ **DO** be realistic: If you're mixing your Metal band and you pop in "Enter Sandman" and your mix sounds "way better" and more huge, SOMETHING IS PROBABLY VERY WRONG. I can't tell you how many times I was asked to go back into the studio with bands to remix. In the studio, they tried to make their mixes sound "big time" and ended up overdoing just about everything. When they'd ask me to go back with them, we concentrated on trying to make everything sound (for lack of a better term) non-irritating. Just "good" - Playing it safe. You'd be surprised what you can do with a "good" but perhaps "unexciting" sounding mix during a mastering session.

[Note: As of this revision, you can find examples of this at www.massivemastering.com - Look for the "Audio Samples" page. You'll find several examples of "problem" mixes and "dull" demos that have been transformed into reasonable and useable tracks.]

- ③ **DON'T** overdo the effects - For the most part, a mastering engineer will make compression and volume adjustments on your recording. Reverb, which is generally in the background, may seem to come up in level. Unless you're using it as a "feature" effect, leave it



at a reasonable level. During mixdown, MUTE THAT VERB frequently to make sure it's not being used as a "crutch" - The mix may well sound "dry" when it's muted, but shouldn't be "soaked" when it's not. A general "rule of thumb" is that once you actually notice it, you may have used too much. Of course, this is a matter of taste. If you're looking for a giant reverb wash, obviously, go with your gut. If you're just trying to add a little "space" and "air" to your mix, it's best to be a bit conservative. You can always ask the mastering engineer if he can tweak the overall verb. It's not incredibly unusual for a mastering engineer to lay a small amount of reverb on a series of mixes to bring them together a bit.

 **DO** Take advantage of STEREO. That being said, be cautious of phase cancellation. Hit that "MONO" button frequently and see if your mix collapses. Also, if the stereo field seems wider than the placement of the monitors in the control room, chances are good that your panning and EQ need some tweaking. Stereo "doubled" guitar tracks are famous for this. They can sound huge and feel like they're coming from everywhere until you hit the "mono" button when they disappear completely. A lot of college and "fringe" radio stations are in mono. Don't forget about them.

Stereo imaging and density is a MASSIVE Mastering specialty, and an art that is rarely practiced in "all-in-one" mastering. It can give a "normal" mix a solid anchor with mono compatibility, while expanding the "air" image in the highs for a rich, wide, yet realistic and dimensional soundstage. It is also a chief source of "LOUD" on a CD. There is no "magic box" or "mastering" program that does this on its own - This is truly all about technique.

🎧 **DON'T** waste huge amounts of time trying to mix every song at the same volume. This is one of the first things that your mastering engineer will handle. You can spend hours bouncing back and forth trying to make sure that every mix rides at the same level. Those hours are costing you money, and causing ear fatigue. Find a reasonable level and mix the tune. **HOWEVER:**

🎧 **DO** try to mix to a "good" level to your two-track. Whether it's a DAT, MiniDisc, or CD-R you want a good signal to noise ratio. You do NOT want to "smash" it. Mixing so the bulk of the mix rides at -18 or -16 dBfs is just fine. Leave some room for peaks (**-6 dBfs PEAKS** or even lower are ideal for a 24-bit mix), and leave some room for the mastering engineer to work.

🎧 **DON'T, DON'T, DON'T** mix with some goofy "mastering" processor across the stereo bus. As mentioned, once it's there, it's there forever. Same with compression. A little bit (1 or 2 dB) of buss compression can really help bring a mix together. With some mixes, it's almost a necessity. Once you get past that little bit, you're likely overcompensating for a weakness in the mix. Look for individual tracks that could use compression or try putting one across the drum or vocal buss. Again, be careful. It's very easy to overdo it, and impossible to correct it later.



That being said, if you "must" hear it through all the bells and whistles, hook them up. Write down the settings that you used. Do a mix. Then, do a mix WITHOUT them. Send BOTH (properly labeled) mixes to the mastering

house so he knows what you're looking for. He may well have a better way of getting it the way you want it.

- 🎧 **DO** keep backups of EVERYTHING. Don't EVER send out your only copy! Keep notes with your DAT tapes and CD-R's - Number and catalog everything that you're going to send out. Clearly mark any previous or obsolete mixes as DNU (Do Not Use) so you don't have any "whoops!" mistakes in the end.

🎧 In Conclusion:

CLOSING NOTES AND OTHER SOURCES:

Let's review...

- 🎧 Noise is bad. Do everything in your power to get rid of or otherwise minimize it.
- 🎧 Concentrate on solid mixes, not "huge" mixes. If you need to fight to make it sound "huge," it probably won't happen.
- 🎧 Use reverb and echo effects carefully, as their signatures will undoubtedly become more apparent during the mastering session.
- 🎧 Get a good mix level, but don't fuss over having all of your mixes *match* in level.
- 🎧 Stereo is good. Exaggerated stereo images are not. Consult your "mono" button frequently.
- 🎧 Once you process a mix with compressors, limiters or other "mastering" processors, it's on there forever. If in doubt, mix with AND without.
- 🎧 Make backups! Take notes on EVERYTHING!
- 🎧 Send all your mastering business to MASSIVE Mastering. :-)

DON'T STOP HERE:



This is by far NOT the definitive answer to everyone's mastering questions. However, hopefully it got you closer to understanding how to best go through your recording and mixing. Mastering can be as subtle as tweaking the levels, EQ or stereo image, or as radical as changing the tonal quality and density entirely. It can make a good recording sound great. It can make a great recording sound wonderful. It isn't quite "magic," but in the music industry, it might be as close as you can get!

ADDITIONAL INFORMATION:

Audio samples and single-paragraph studies of various projects can be found at www.massivemastering.com in the "Audio Samples" section.

"Making a Great Master: Essential information for musicians, engineers and producers" is available from Disc Makers as a PDF file. It contains useful information on the physical production of your final mix. Formats, sample rates, calibration tones, etc. are covered in great detail. Highly recommended reading for almost anyone in the industry!

RELATED WEBSITES:

-  Massive Mastering
<http://www.massivemastering.com>
-  Disc Makers
<http://www.discmakers.com>
-  National Academy of Recording Arts & Sciences
<http://www.grammy.org>
-  Audio Engineering Society
<http://www.aes.org>

ABOUT THE AUTHOR:

John Scrip has been engineering audio since the mid 1980's, working live and in the studio with artists that run the gamut "from garage bands to Grammy® winners." After designing and overseeing construction of the acclaimed JEM Music Complex, he stayed on as Chief Engineer and started specializing in mastering. After JEM transferred ownership in the late 1990's, John decided to further his practice in mastering and start a dedicated, but "budget friendly" service to serve the emerging boom in home and project studios. MASSIVE Mastering helped pioneer the emergence of "mail-order mastering" and slowly grew to employ a world-class analog and digital signal chain while "trimming the fat" in client-side amenities to keep the business overhead low. MASSIVE Mastering now has a clientele of artists from several countries throughout North & South America, Europe and Asia.

A voting N.A.R.A.S. (Grammy® organization) member, John's album credits include a widely varying collection including blues, rock and metal bands such as Manowar, the Radiators, Subsonic and Metal Militia; the flamenco & world music recordings of Amsterdam's Jacco Muller and Artur Trajko; "pop gospel" sounds of the Sun State Quartet, Vignola and the First Four; adult contemporary recordings from Grammy® nominee and Gold Record winner Dave Rudolf and dozens more covering several styles.

When not tucked away in his mastering room, John can be found behind the console of a municipally-owned Chicago area performing arts center as an audio engineer and sound designer for various performers "from garage bands to Grammy winners" and for Broadway style musicals and plays.

As the "RecTech," John has helped bands and novice engineers through a series of articles intended to cut through some of the more confusing aspects of recording, mixing, mastering, production and gigging. The RecTech articles appeared regularly in print and on several websites. John also moderates the Mastering forum at StudioForums.com and is a Contributing Editor at StudioReviews.com.

John is a pioneer in "Mastering by Mail" which provides his clients a professional, dedicated mastering service that bridges the gap between studios charging hundreds of dollars per hour and project & home studio mastering setups. "Old School" techniques, combined with modern technology and low overhead provides artists with high quality audio mastering without the "high quality" price tag. His clients, based in points across the USA, Canada, Asia, South America and several European countries, run the gamut of musical styles.

— DPI



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