

# Mixdowns

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Before I get into the actual tutorial aspects of this guide, I need to briefly insert the usual disclaimers. Every time I write a guide, or a How To related to the music making process, I inevitably get emails from people disputing my ideas or the methods I propose. It's important to understand that I'm in no way saying that the ideas in this guide are the only way to approach a mixdown, nor are they necessarily the 'right' way to do things. I can only share with people my own experiences and the way I learned to do things. Certainly people should always keep an open mind and try any and all alternatives on their quest to create their own sound.

So then, what is a mixdown? In the simplest sense, it's combining all of the separate elements you created while writing your track. But I think it's more than that too. To me, it's about making the sum of all parts greater as a whole, about creating something really inspiring based on various unique combinations of parts capable in a mixdown. Anyone who's ever tried to redo a mix from scratch on one of their songs knows that you can get a vastly different sounding song each time, using the exact same parts. It's how they all interact together that really gives the song it's feel and emphasis.



How do we start then? Most likely, you already have. It's not uncommon for people to actually be crafting a rough mix of the song as they write. If one part is too loud and starting to get on your nerves or distract you as you work on others, you turn it down. If you can no longer hear the bassline for instance, you turned it up. A lot of people will not even approach the mixdown as a separate process, they shape it while they write, and when that phase is done, the song is

done and they send it out for mastering. Certainly nothing wrong with this, many a good tune has been written this way.

But I'm going to write this article assuming you want to learn how to mix a song from scratch. You listen to your song and while you can hear all the elements, it doesn't have the impact you want. Or maybe, it just sounds kind of dull and flat compared to other songs you admire, there's no depth and detail. Sometimes we can fix this just by tweaking a few parts of the rough mixdown you created while writing, other times we need to start totally over with a fresh canvas if you will. Hopefully the ideas below will help you with either method.

## Preparation

Where you start can depend completely on what kind of song it is. I personally don't approach a mix this way, the process is largely the same for me regardless of what kind of song it is. But it can be important to start by recognizing what parts of the track are the focus, what is most important. In a pop tune this is largely the vocal, in a dance tune it's the kick and bassline, in an ambient song it could be the textures or pads. So take a second to think about, and to recognize what the focal point is in your song. I don't think you need to necessarily always pay more attention to this while mixing, but certainly you want to always make sure something else isn't over-shadowing it.

To begin with, I tend to follow the school of thought that you should not touch the master fader in your DAW (Digital Audio Workstation, i.e. sequencing/composing software) or your hardware mixer. I leave this set at 0dB, and adjust the individual track faders if the song starts to clip the master output. This is just my preference, but I think it forces you to work in a more consistent fashion, and after time, you can easily learn to avoid this happening as you mix or write.

I also believe in leaving approximately 6dB of headroom in my songs once everything is finally done in the mixdown. This means that once you're done with the mix, the loudest parts of the song will not be above -6dBFS on the master meter. Since we should always be rendering or exporting our mixdown as a 24bit file, this has no negative impact on the amount of detail we can capture in the song, and leaves plenty of room for the mastering engineer to do their work. Even if you're going to master your own song, I recommend this practice, if for no other reason than it ensures you are not unintentionally clipping your song anywhere. If it sounds quieter than you're used to, turn up your monitors or master volume knob on your soundcard some to compensate. For more details, see my mastering guide here:

**<http://innerportalstudio.com/articles/Mastering.pdf>**

Leaving 6dB of headroom is something you need to think about often while doing the mixdown, so keep an eye on your master level meter, and turn things down if you start seeing the signal go over this value (assuming you're following my recommendation that is!).

On that note, I personally think it's important to keep your monitors fairly quiet while doing a mixdown, for a couple of reasons. First of all, when things are louder, they always sound more exciting. This is a fundamental aspect of the way our ears work, the way we hear different frequencies in relation to others is dependent on the volume we hear them at. (Google Fletcher-Munson curves if you want more info on this phenomenon.) The simple result of this is that while things might sound great at louder volumes, they tend to sound very flat and dull at quieter volumes. However I've found that the reverse is NOT true. If you can make a song sound great at lower volumes, it will only sound that much better when turned up.

Secondly your ears begin to actually get tired when forced to listen to loud music for extended periods of time, something referred to as ear fatigue. After awhile you begin to lose the ability to make accurate decisions based on what you're hearing. Trying harder or forcing yourself to focus more will not help, your ears just will not convey the proper information to your brain anymore. The only way to fix this, is to take a long break from mixing (we're talking hours here, not minutes), and likely you don't want to stop just when things are going well. So keep the volume down for most of your mixing, and only turn it up once in awhile if you need to listen louder as a reference. You should be able to easily talk to another person without raising your voice if you have the volume set right. I'd bet money that in the end you get a better overall result, even if the process might not be as fun as you're used to.

## Core Elements

Since most people reading this will largely be in the dance and electronic music crowd, I'll start my imaginary mixdown for this tutorial with the elements I'd say are 'usually' the most important; the kick, snare, bassline, and lead synth/vocal. Likely the first three are where most people start in any type of tune with a strong rhythm, so the same process might apply to other genres and forms of music as well.

The purpose of starting with these parts is two-fold. First, they are likely the core of the song, and what will impact people the most. They are the main elements that the song is built around, so we should focus on the important parts first. Second, there's a practical engineering aspect to this as well, in that these will probably be the loudest parts of the song. So by starting with these, we can make sure that our overall levels are set properly, and that we're not clipping and possibly ruining all of our hard work. I cover the details of proper level setting in my Leveling guide if you want more:

**<http://innerportalstudio.com/articles/DigitalLevels.pdf>**

Back to the core elements. Let's start by muting or pulling down the channel faders for every single part in the song. If you have any return channels you're using, you can leave those unmuted and at 0dB for now. Unmute the kick, snare and bassline, and raise those until you see the master meter hitting about -10 to -8dB's when they sound roughly balanced the way you want. Setting these parts to that level will usually leave us enough room to add the rest of the parts later on, and still achieve that final set point of -6dB on our master fader. These are the strongest parts of most tunes, or perhaps I should say they usually carry the most energy.

The hardest part of getting a good mixdown for most people is the low end, getting the kick and the bassline to not compete with each other, and to not drown out any other instruments. This is something best addressed while writing the track actually. If you know the bassline is really deep and has lots of subs, then likely you'll want to use a kick sound with more beater noise and less low end to keep from competing with the bassline. Likewise if the bassline is more distorted or uses a lot of lowpass filter tweaking to give it more bite (and thus is placed higher in the frequency range), you can get away with deeper kicks, 808 style and all that. But

this isn't a hard and fast rule, there's other things we can do to get these two elements working together.

The first thing you should try is just using the volume faders of each to see how well you can blend the two via the simplest means. Sometimes this is all you need to do to get a really great sounding low end in your song. If your kick is still getting lost when the bassline is playing, you might try layering another kick drum sample over the original, this one with a brighter beater sound (that clicky aspect caused by the drum beater hitting the skin). Many times this can go a long way towards making your bass drum stand out more, and is something to think about when you're first writing your drums.

Side-chaining is another viable method, though one that's best used sparingly IMO. With side-chaining, you're triggering a compressor on the bassline line track to basically turn down the volume of the bassline briefly when the kick drum hits. It doesn't work with all basslines and kick drums, so I don't recommend it for all but a few cases. The specifics of side chaining depend largely on what plug ins and DAW you're using, so check the manuals of those for more info on how to do this.

Another option is to use EQ to help the two sit well together. I tend to cut frequencies below 30Hz in both my bass drum and bassline, this improves how much headroom I have in most cases, and helps clean up both sounds and make them less muddy sounding on loud club systems. This is really useful when you're using synthesized kicks and basses, which can have a lot of information down in the lower frequencies that no one will ever hear. Don't do this if you don't need to though, use a spectrum analyzer to actually see if there's something down there to cut in the first place. And you don't need to cut a lot many times, only 5-6dB can make all the difference, don't try and remove these freqs entirely.

What if the opposite is true though, and your bassline or kick lacks a lot of punch and low end? Well, layering a sine wave under the bassline can help this, even if used quietly it can add a lot of low end to the sound. The key is to not overpower the original bassline sound where all the texture and interest is, so keep the level low on this. Ditto on the kick drum, try layering a deeper kick underneath it to add more weight to it. Already we can see that some mixdown problems are really issues with the sounds we choose, and not best addressed in the mixdown!

You can use EQ to cut and boost certain frequencies in each part as well, to help give them their own sonic territory in the frequency spectrum. Maybe you cut a few dB at 80Hz on the bassline, while cutting some at 120Hz on the kick (for example). Follow your ears, there's no right answer, and for each song you'll often need to try a lot of things before you find the one that works the best. On that note, don't get too hung up focusing on any one part while doing a mixdown, it's a sure fire way to get distracted and lose sight of the overall picture. And besides, you could spend days getting these two elements right, and then when you add the rest of the parts of the song back in, realize you can't hear all that work anyway. Work fast, and keep the overall song in perspective while you do. You can always come back to these parts later on if they're not working well with the rest of the song.

Finally I tend to make my basslines and kicks in mono, especially if it's a tune for the dance floor. This way the core foundation for the song sounds the same out of both speakers, and gives the stereo imaging of the song a real center which you can play off of later on, when you add other parts. You don't always have to use a mono bassline, but I've rarely found a good use for stereo kicks.

The snare is the next sound I would approach, and often I'll be working on it the same time as the bass and kick. For rock and breaks music, typically the snare will be mixed a little louder than other forms of music using a 4/4 kick drum. It's more of a focal point, and helps tie together the various rhythm elements to a predictable pattern. If you're using samples of snare drums, then sometimes there's very little you actually need to do to a snare in the mix. I find that over-processing a snare often just takes away from the character that led me to choose that snare in the first place.



There are times that some EQ can solve some issues or improve things though. A dull snare can often be fixed by boosting some around 2kHz, though you have to be careful as this is the main frequency your lead is likely to sit at as well. Boosting around 8kHz and above can add a bit more "air" and openness to the sound. I'd use a low Q value and only a couple dB's of boost on this to keep it as smooth as possible. If the snare sounds flat, like a you're hitting a wet newspaper (i.e. no punch), then a gentle boost around 400Hz can often solve this. It brings out more of the drum sound of the snare, and less of the rattle. Again, don't take the frequency and gain recommendation here as gospel, play around and see what sounds best for each situation.

Sometimes I'll put snares in mono, not always though. If it was something I used a drum synth to make, then likely it was created in mono anyway and it makes no sense to put it in stereo. If it was a stereo sample, then likely I'll keep it that way. It doesn't hurt to try both options and see what you like best. Double check once more that you're master level is not above -6dB while you're at it.

## The Lead

When I refer to the 'lead' in a song, it could be the vocal, or perhaps you have a synth that has the main focus in different parts of the song. But it could be just as likely that your song doesn't have a defined lead instrument as well, so don't feel the need to create one if there doesn't need to be one. Because there are literally millions of ways of creating a lead sound, and coming up with new ones is the goal of most producers, I won't go too much into specifics here.

Ideally you want to make sure that the lead is always able to be clearly heard, that it doesn't get buried by other elements of the mixdown. Usually this means that it's slightly louder in comparison (use your ears, not level meters here), but it could just be in it's own frequency range too. If we're talking about vocals, then it's important that people can understand every

word. This can be tricky figuring out on your own if you wrote the lyrics or know what they are ahead of time, so maybe get someone else to take a listen when you're done and get a second opinion.

A lot of time I think it's the lead that seems to end up with the most effects in people's songs, at least that's how it seems to me. As with everything, make sure that you have a real need for each effect, overdoing it can often have the opposite effect of burying the lead or making it tiring to listen to. Sometimes a completely dry lead can have the most impact of all too! Remember less is more, especially with something like reverb or delay. Both of these can make a sound seem further away in the mix, like it's being played in the distance. This is one more thing that can make a lead sound dull or unimportant, so use these two effects minimally.

Typically a lead is panned dead center, it's the most important, so you want it coming from both speakers equally. That's not a hard and fast rule though, so experiment if you feel the need. Panning leads back and forth in the speakers can be an ear catching effect if done sparingly, too much and it's annoying and can be distracting from other song elements.

By now you should have the main elements of the song working together, the core drums and bass providing a solid foundation, and the lead providing the focal point. Now it's time to add everything else that completes your tune, just remember you don't want to bury these main sounds!

## **Percussion**

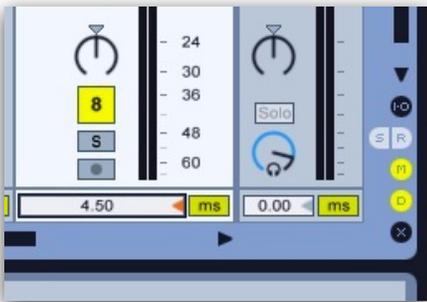
The role of the ancillary drum sounds is to support the main groove, so don't make these parts too loud in the mix. Especially hi hats, which I think most beginners tend to make too loud. Sometimes it can be helpful to roll off (gently cut) frequencies below 1kHz when dealing with cymbals, it can make them less intrusive and they sit better with the other drum sounds without getting in the way of any hand or ethnic percussion you might be using. Use your ears, it shouldn't drastically alter the character of the cymbals when you do this, if it does, then think twice about it. Only a few dB's of cut can be enough to make a large difference, so as with all things in mixing, follow the less is more principle. Boosting cymbals and hi hats should be done sparingly as well, it's very easy to make them harsh sounding this way.

Toms and hand percussion, like tablas and bongos, often work best when panned a little bit to each side. Try and split up the instruments so you have an equal number on each side of the stereo field to keep the mix sounding balanced, and not like one side of your drums is louder than the other. With low toms you might need to cut some of the lower frequencies out to keep from clashing with bass drum. With higher toms the opposite is true, except that we're trying to keep from clashing with the snare. I recommend very low Q values for this kind of work, it keeps things sounding more natural, gentle shaping is what we're usually after.

## Pads, Chords, and Background Vocals

The main function of these elements is usually to support the harmonic or tonal aspects of the song. The key word being support, so you need to make sure that they do their job in the song, but don't overpower the main elements. These are usually the parts I get a bit more heavy handed with when it comes to EQ during the mix. Well, actually I tend to just create them with very narrow frequency ranges in the first place, but you can do the same thing after the fact with EQ.

In general I find that they need very little low end to do the job, and that way they don't clash or bury the main components of the lower end of things, namely the bassline and kick. So you might roll off everything below 600Hz, as well as maybe some top end too, unless it's a very 'airy' pad sound. Usually panning is the best way to make these fit in the song, though things like reverb and stereo delay can also be used to make them sit further back in the mix too. Panning delays are fun here, but as always don't overdo it to the point that it detracts from the main song elements.



Another trick is to double these tracks, or create a copy of the track in your DAW. Then delay one track by 4-5ms, and pan it all the way left, and the other one all the way right. This spreads them out to the far sides of the mix, and gives a neat detuning sort of effect. You can also do this with synth pads, but detune the left side by positive 3-7 cents, and the right side by negative 3-7 cents.

Once again, double check to make sure that you're not hitting that master meter above -6dBFS. If you are, the easiest way to fix this is to temporarily group all the tracks (if your DAW supports this) and lower the level of all the tracks at once. If your DAW doesn't support track grouping, then you'll need to go and lower the faders of each track by the same amount. The easiest way is to do this numerically. Look at the dB value readout for each fader position, and type in a new number that's say 3dB less than this. The actual value will depend on your song and how high the master level meter was showing of course. Just be sure you subtract the same amount from each track.

## Sound Effects and Ear Candy

Sometimes it's the little things that can make a song really fun to listen to, and that's what I'm referring to when I say ear candy. Those weird sound effects, fills, and transitional elements that add interest and variety to the song. Really not too much specific to do with these sounds, just remember to not have them so loud that they take away from the rest of the song.

This is especially important for sound effects you might use coming out of a drop or breakdown. When the song kicks back in, you want the song elements to have all that impact and focus, not the sound effect before them. So if the effects are too loud when the drums and bass come back, they might sound wimpy all of a sudden in comparison. EQ can really help with this, if you remove a lot of the lower frequencies, the effects can have a bit more volume, and the main elements of the song will still hit hard when they come back in.

In general I'd say that it's the sound effects and other small elements that can make a song hard to mixdown. If they clash with other areas of the songs in terms of frequencies, things can just sound messy and cluttered. So use EQ or synthesis to really shape each sound to have its own space in the mix.

## Putting It All Together

Hopefully by now your mixdown is 95% of the way there, and everything has its own place. All your tracks should be unmuted and playing back together. I recommend taking a ten minute break and going outside for a bit. I find that being out in the 'open' sort of re-calibrates my ears if you will, and gives my listening a break from the 'sound of my room'. Vague concepts, I know, but your ears likely need a break and this is a good time to take it. Ideally you'd take an even longer break, overnight perhaps, but I know that won't happen so at least take ten minutes.

When you come back to listen to the mix, you'll probably notice one or two parts that sound too loud or quiet so adjust those as needed, so go ahead and do any little volume corrections you think the tune needs. Listen and make sure you can hear all the tracks in your song at the right times. If not, think about if you really need them or not after all. Parts that don't really add much to the song just add to the clutter, so don't be afraid to remove them. It's not easy I know, especially if you've spent a lot of time on them. But you have to keep the SONG in your mind as the important part, not the individual parts. If nothing else, render out unneeded parts and save them for use in another song, that makes it easier to delete tracks in my experience.

Listen to the song all the way through a few times. Get up and move around your room as you listen, or maybe listen from the hallway or another room nearby. Can you still hear the main parts of the song? Is there any part that sounds too loud everywhere but your studio? Try playing the mixdown back at different volumes, from really quiet to really loud (neighbors depending). Try listening on different headphones too. Likely a lot of people will be listening on iPod ear buds these days, so those are good to have to check things on too. Listen to it in your car, or if you're really lucky, at a club on a big sound system.

The goal of all this is to adjust the mixdown to obtain the best possible compromise for making your song sound good on as many sources as possible. With practice you will eventually know how what you hear on your studio monitors will translate elsewhere, and you can skip some of these steps. But for now, it's a good idea to listen in as many places as possible. I firmly believe that you should NEVER find yourself saying "well, it sounds ok, but I can fix that in

mastering". No no no, now is the time to get your song sounding exactly the way you want, just a little quieter at this point compared to other songs (see my mastering link above for more on this).

Don't be discouraged if it still doesn't sound exactly the way you want, you're learning, and experience only comes by repeatedly doing the same thing over and over. Sometimes it takes more than one mixdown attempt to get it right. By going through and playing with EQ and spectrum analyzers while doing the first mix, you learn more about each part and how it fits with others in the song. Don't be afraid to remove all EQ, reset all levels to 0 and start over. Yes, it sucks sometimes, but most of the time doing this a second time works much better. I bet you end up needing to use a lot less EQ on the 2nd try, which can be a case of once again less being more.

## Compression

Some of you will likely have noticed that I haven't mentioned compression yet when talking about mixdowns. That's because I personally feel that it's over-used these days, and that it's best to try and get the mix right without it first. Sometimes however, it can help situations, so if all else fails, don't be afraid to try it. You can find a guide I wrote on compression here:

<http://innerportalstudio.com/articles/Dynamics.pdf>

However there's a few quick tips I can pass on, such as the so called "New York Trick" for adding compression to drums. Basically you create a send or buss track in your DAW, and place your compressor on that with a very fast and hard setting. You're going to really squash things on this channel, but that's ok. You send a copy of all of the drum sounds to this compression channel, and really compress the life out of them, it's one time to go overboard with compression.

The compressor helps merge all the separate drum sounds into one huge drum sound, and you blend this compressed version of the drums in with the completely uncompressed version. You're basically doubling the drums, one uncompressed version that retains all it's transients, and quieter version of them all heavily squashed together underneath. It's a good way to give the drum more punch, without destroying all the transients. But again, sometimes it can ruin the drums too, so don't think this is something that always sounds better.



A quick and easy way to set up a compressor for other instruments is to set the attack to it's max amount, and the decay to the fastest setting. Set the ratio to 3 or 5, and lower the

threshold until you're seeing about 3dB on the gain reduction meter on the plug in. Set the make up gain to auto if the compressor has this, or raise it to the same amount you see on the gain reduction meter if it doesn't.

Now you can play with the attack and release settings to get the sound you're after. Lowering the attack setting will sort of dull the sound a bit, which might be good for say tweaky synth parts or basslines. Raising the release will give things like drums and percussion more 'oomph', just be careful not to go too high or you'll get the compressor pumping, which may not be a sound you're after.

Regardless, compression is one of those things that's entirely dependent on the sound you're feeding it, so it's pointless to discuss it in too much detail. It's best to teach yourself what all the controls do, and then spend time experimenting with each one on different source material.

## Wrapping Up

Sometimes our ears just don't work right on some days, and nothing you do is going to help it. Or maybe they're just fatigued from being forced to listen critically in ways you've never done before. Don't stress over it, just save the project file and come back to it another day, or even a week later if you have the patience. The more you do this, the better you get, there's no shortcut to learning the art and skills of mixing, except to do it as much as you can! Look at it as practice, instead of a wasted day if that helps.

Just don't give up! When you're done with the mixdown, ideally the mastering engineer (or you) will have to do nothing but convert it from 24bit to 16bit, add dither, and raise the level a bit. That should be the goal of all producers, to produce a mixdown that doesn't need any other processing done to it!

On a more personal note, if this guide (or any of my other guides) has helped you in your music making, please consider a small \$1 donation via pay pal to the email address below. Even a dollar here and there really helps me and my family out more than you can realize. Thanks, and I hope you find this guide useful.

Peace and beats,

**Erik M.**

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*I'm the owner of Inner Portal Studio a Seattle-based facility with over 15 years experience providing quality mastering and mixdowns of electronic music for producers around the world. I have been writing, releasing, performing and DJing electronic music of all genres for over 20 years. You can find my blog, original music and DJ mixes, as well numerous audio production related tutorials available for free at <http://tarekith.com>.*

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