

THE CM GUIDE TO RECORDING VOCALS

By Ted Perlman

I. INTRO:

It's often said that the human voice is the most perfect of all instruments. It doesn't require strings, reeds, a keyboard, skins, or a computer. It just requires someone who has been blessed with the ability to make sounds with their voice that strike our ears in such a beautiful way that we begin to smile and feel better. That's what great "singing" is. Unless you're creating instrumental music, the vocals are one of the most important elements of any recording. However, this is a topic in which most computer musicians are severely lacking in experience. No matter how many dance tracks you program or remix in your home studio, until you become adept at working with singers and getting their vocal performances recorded into your computer properly, you will only be a "half-producer".

Don't worry - we're going to get you up to speed right now. When you get done studying his tutorial, you may not be a Rick Rubin or George Martin, but you'll be able to get decent sounding vocal tracks. After that, it's up to you to keep working at it until you have many hours of experience. Only then will you be considered a "computer recording vocal expert".

In reality however, you - our dear readers - have a distinct advantage over the engineers and producers of yore - you have a modern computer DAW! Inside that incredible machine can be software emulations of classic vocal plugins that were only available in the most expensive studios. Inside your DAW you have the capability of recording endless vocal takes without worrying about how many tracks you have left. You have the power and ability to "comp" (combine) them together for a perfect vocal track without having to bounce or get out the razor blade for splicing pieces of tape together. *(A technique used back in the ancient days of analog tape...many, many years ago before any of the editors or writers of this magazine were even born)*

We're going to show you how to get the vocals into the computer, how to record multiple tracks, how to use those tracks, how to edit those tracks, how to process those tracks, and finally how to mix those tracks so your vocals shine like "new money". Regardless of which software you are using, we will show you how to easily get great results often using plugins and effects that are very affordable. *(We'll even use some of the plugins that are included for free on the CM CD).*

II. WHAT YOU NEED AND WHY:

Let's start with what the basic essentials necessary for recording a VOCAL track:

a. Microphone(s): This is probably the most important item necessary for a great vocal recording. Even if you have a great singer, using a cheap-sounding mic will take that beautiful voice and make it sound lousy. However, there are many brilliant inexpensive mics available now. Most of them are made in China, but designed in each company's home country. These mics are often 1/10th the cost of the expensive mics they are emulating, but they sound and perform (in many cases) "almost" as well as the originals. Inexpensive mics from companies such as ADK, Studio Projects, M-Audio, Oktava, and CAD have been used to record vocals on many hit recordings. Obviously, if you can afford a Neumann U87, an AKG C12, or a Telefunken ELAM 251 (3 examples of classic but very expensive mics) then go for it, because you not only get the great sound of the original model, but you also get the "name recognition" factor - something that will impress not only the singer but also the client. A great mic will let everybody know that YOU know what you are doing, and they will trust you a little bit more in regard to the rest of the project. It's always best to have a few different mics on hand, because each vocalist will sound different on various mics. The more varied your mic collection, the more chance that there is that at least one of them will sound great on any singer.

b. Preamps: (see boxout #2 below)

c. Compressor (outboard): Don't believe it when you read things like "if you record at 24bits or higher you don't need a compressor". It's not true - you should ALWAYS use a good quality compressor after the preamp and before the signal arrives into the computer. A ratio of 3:1 will stop most unexpected jumps in level and still not be noticeable enough to change the overall quality of the vocal.

d. Sound Card Interface: If you are going to monitor through the sound card and not through a mix desk, then which sound card you choose becomes more critical. Certain soundcards are available that have a fantastic feature called "zero latency monitoring", which means you'll hear the signal immediately. This is very crucial for the singer, who will have a very hard time singing if they are hearing their vocal delayed in the headphones. We suggest asking some of your friends who have professional experience which sound card they are getting the best results from for vocals. Nowadays, even if you're using ProTools you have the option of choosing a sound card other than those from Digidesign. Most M-Audio cards now work with the special version called "M-Powered ProTools", which is basically the same as ProTools LE.

e. Effects (Reverb, Delay, etc): There's not a singer around who doesn't want to hear at least a little bit of reverb on their vocals in the headphone mix. It helps the singer feel like they are in a performance space instead of reflection-less studio. You can use the built-in effects from your software (be careful of latency), or use an outboard hardware reverb unit, which when used with a mix desk will give a great reverb sound for the singer without any latency or drain on your computer's CPU.

f. Software: All of the major recording softwares available today offer excellent features for vocals. No matter whether you are using a PC or a Mac, there is a program that will suit your budget. And just because a program isn't expensive doesn't mean it is lacking in any features. "Traktion" is an excellent recording software that includes many plugin effects designed specifically for vocals, and that sells for about one third the price of the major programs. Pick your software based on who else you are working with, because it will be easier to exchange songs for vocal overdubbing if you and your partner are both using the same program. The final decision comes down to who you are collaborating with. If you plan on making music your profession, it's probably best to use software that is cross platform. It will be easier for you in the long run.

g. Accessories: One of the most important accessory for vocal recoding is a "pop filter". They are the round appendages surrounding what looks like a ladies nylon stocking that you see in between the singer's mouth and the microphone. They stop (or lessen) the popping sound made by the letter "p" that can ruin a great take. They also lessen sibilance, which is the harsh "s" sound that occurs when some singers over pronounce words containing "s" syllables. Professional vocalists usually know how to move their mouths in relation to the mic so that they don't need a pop filter, but it's better to have it available just in case. You never know when you are going to get that one magical performance. Another major accessory is a well made mic stand. We mention it because you'd be surprised how many studios get the cheapest one in the store. You should get the absolute best quality mic stand you can afford. It's a great investment, and believe it or not it will help your vocal recordings by not adding any squeaks or boms. Plus, you won't ever have to watch the singer bending down to finish the song because the stand is slowly falling.

h. Headphones & Headphone Amp, Remote Boxes, etc.: Whatever you do, DO NOT get cheap headphones for the singer. You want to get the BEST headphones that you can afford. Brand name phones such as AKG, Fostex, and Sony have been around in pro studios for many years. Those phones cost between \$100.00 - \$200.00 a pair. You'll need at least a few pairs or more if you're going to be recording more than one singer at a time. If you have a larger budget, try the Ultrasonics 750's. They are a revolutionary new headphone design that employs a new technique that stops "ear fatigue", a common side effect of working long hours using phones. It's also a good idea to get a powered headphone box (like the Behringer "PowerPlay") so the singers can adjust their own volume levels as they are singing. Depending on your particular studio layout and how many people are going to be recording, you might also need some remote headphone boxes.

i. Computer: Another subject that has no "right or wrong" choice. Suffice to say, you should get the fastest computer you can afford. Latency is the enemy when recording vocals, and speed is your friend. Whether PC or Mac, look for machines that will run your preferred software. Logic and Digital Performer are Mac-only, Sonar is PC-only, Cubase, Nuendo, and ProTools are cross platform (both PC & Mac).

WHAT YOU NEED...BOXOUT #1:

“Tuning Plugins” - For vocals these are extremely necessary tools for editing and mixing. The “big Daddy” is Celemony’s “Melodyne”. You can not only adjust the tuning of certain notes but you can also write in totally different notes for a harmony track or two. Previously, Melodyne worked via only Rewire or its own proprietary “Melodyne Bridge”, but they’ve recently released VST versions of both the Bridge and the Plugin. The oldest and most commonly used tuning plugin is Antares’ “AutoTune”, which started out as a ProTools only TDM plug, but is now available in most formats - DirX, RTAS, Mac VST, and the soon to be released Windows VST version. It’s best to use these software tools AFTER the vocal is recorded in the editing and mixing stages. You can tune individual notes when you hear something truly out of tune, or you can use them as inserts during the mix process to gently bring errant notes back into key. It all depends on the vocalist and style of music. For example, in a Pop style you might want every note to be ‘dead on’, but for Blues having the notes slightly off in certain riffs gives the vocal its “magic”.

WHAT YOU NEED...BOXOUT #2:

“Mic Preamp” - A subject that can cause more arguments than politics or religion. Everybody has their own personal favorite. The preamp takes the signal from the mic and amplifies the signal level to one that is necessary to get a good recorded signal level in your software. The mic preamps in the little Mackie mix boards are excellent, even though they are not the “stand-alone” type favored by most engineers. There are great sounding and inexpensive mic preamps from companies like PreSonus, M-Audio, Joe Meek, and others. Our best advice is to take your favorite mic to the music shop, and listen to how it sounds with various preamps. The best sounding one that you can afford is your preamp. If you are going to be recording more than one singer at a time, then you’ll need more than one preamp. There are some models that have eight preamps in a one rack space unit, and some that have two independent channels that can also be configured for stereo operation. They can also have various connection options. If you want to go directly to your computer from the preamp, then look for one with a digital output; if you’re using a mix desk, then you need the model with analog outputs.

III. RECORDING - THE FUNDAMENTALS

A. Recording A Vocal:

Step #1: The first step is to enable a track in your software to record the vocal. It's always best to have a template set up with at least 8-10 tracks for the lead vocal, another two or three for doubles, and another two for adlibs. Having the tracks preset as far as input and output enables you to quickly move to another track for another take.

Step #2: Next, we need to decide on a microphone that suits the vocalist. If you only have one mic available, then obviously you'll use that. But if you have a few, you'll find over time that certain mics work better for males and certain ones for females.

Step #3: After you pick the mic, then place the pop filter in front of it. You should advise the vocalist to start out singing about 3-4 inches away from the pop filter. They can move closer or further back depending on the sound you're looking for. Closer has more bass, further away has less but also less presence.

Step #4: You then have to decide which preamp you are going to use. This will depend heavily on which mic, since certain mics sound different with each preamp. A good starting point is to use a condenser mic with a tube preamp, or a tube mic with a solid state (non-tube) preamp. You might have to engage the pad on the preamp depending on how loud the singer is.

Step #5: After the preamp, it's best to insert a hardware compressor. Set this at about a 3:1 ratio. It won't be heard as much as it will keep the vocal transients from jumping out and causing distortion. A compressor will also even out the performance just in case your singer doesn't have very good mic technique, and keeps moving back and forth from the mic.

Step #6: At this point you will want to give the singer a little bit of reverb in their phones. If the signal coming back into the phones is too dry, it will be hard for the singer to give a soulful and natural performance. (Unless they like it dry). You can either add the reverb from your software or from an external hardware unit.

Step #7: You then have to decide how the recorded signal will be returned to your monitors and to the headphone mix. It's important to be able to have control over this level, because singers sometimes want the playback level lower than the monitored signal. You also need a panning option in case the singer wants the original vocal on the left or right when singing a double track.

Step #8: Make sure you have a reverb or effect send enabled for the playback vocal tracks. It's best to have all the lead vocals bussed to a subgroup. That way you can apply a reverb send from there instead of adding it for each channel.

Use the same reverb/fx that you are using for monitoring so that the recording and playback signals sound as close as possible.

Step #9: Make sure you label each track so you know what was different about each one. Nothing fancy - take #1, take #2, chorus double, etc. should be sufficient. Just as long as the tracks don't read audio 1, audio 2, etc. That will surely cause confusion both when overdubbing and mixing. You might also make notes on the lyrics regarding each performance.

B. Overdubbing Vocals:

1. Doubling and Tripling Manually:

After you have recorded and edited/comped together your main vocal, you may find that certain sections are not powerful enough – they are not giving you the desired “fire” or depth necessary for the song. You can make a double of the vocal using the technique discussed elsewhere in this article, or you can have the singer sing again and double or triple their vocals. If the singer is experienced doing this, it is a fabulous effect. Whether or not to do it this way or the software way depends totally on what type of doubled voice you desire.

- a. Turn the music track down in the headphones so that the singer can hear their previous vocal clearly.
- b. Pan the original vocal slightly off center so that the singer can clearly distinguish the new voice from the old. Pan the new vocal slightly in the opposite direction.
- c. Play one line at a time for the singer. Let them listen to exactly how they phrased and sang previously. Don't try to do more than one or two lines at a time, or else the new vocal will not match the old one closely enough.
- d. Make sure that the singer performs the double in a slightly lighter voice than the original. It will blend better if the double is not sung as hard.
- e. Record each line, and then play it back to check that it matches. Sometimes it's a more natural sound if the double is not 100% exactly the same as the original. If you want the double to match 100%, use the software doubling technique instead.
- f. If a tripled voice is necessary, follow the above procedure, but have the singer perform the triple to the original vocal, NOT to the double. Otherwise things will get a bit too loose and sloppy sounding.

2. Adlibs:

Adlibs are the vocal riffs or phrases that occur only at random places throughout the song. They are typically in between the song lines, although they even occur at the same time as certain lines. It all depends on each producer's taste and style. A common technique for recording adlibs is to have the singer sing the entire song, and then go back and record the adlibs on a separate “adlib track”. This method gives the producer the most options for placing the adlibs where

they fit the best, which are not always the same song positions as where the singer sang them. This also lets you take the adlibs and do many creative things with them – double them, run them through different effects than the vocal (distortion, vocoders, modulations fx, reverse them, chop the words and syllables up, etc. Some singers prefer to perform their adlibs at the same time they are singing the song, but extracting the adlibs from a song performance is much harder to do without having the vocal sound clipped or chopped up.

3. Reference Vocals:

A reference vocal is one that is not intended to be the final performance on the recording. It is exactly that – a reference or guide only. A typical use of this would be where the producer wanted to show the singer the type of performance, style, and phrasing that was called for. The producer would record a reference vocal and send it to the singer to learn before they got together in the studio for the recording session. Another use would be as a guide for the background vocalists to perform their parts to. Normally, the reference vocal would be replaced after the backgrounds were finished. HOWEVER, there have been many, many instances where the reference vocal ended up being the final vocal. Singing is a creative process, and a mysterious one at that. Oftentimes, the very first take has a certain magic and spontaneity that doesn't happen on subsequent takes. In instances like this, it's always best to use the performance that has the best feeling, even if it is not perfect. Editing and fixing a soulful vocal track will ALWAYS result in a better final recording. This is also another reason to ALWAYS write down what mic and preamp were used. If you end up going back and punching in on the reference vocal, you don't want the new audio to sound different.

RECORDING - THE FUNDAMENTALS ...BOXOUT:

Mic Technique for Singers: This is a technique that will help you get a great recorded vocal. If the singer has been recording professionally they should know this, although not always. It's simple. When singing softly, move closer to the mic - when singing loudly, move back. The trick is making the transitions from close to far away sound seamless and not obvious. Pro engineers/producers usually let a singer sing the song down one time and see if they have good mic technique before discussing this. If the vocalist is balancing themselves okay, then they already know about this. But if they are standing in one position and screaming into the mic with their lips planted on the pop filter, you will have to use your best psychology techniques and bring this up. But do it gently. Try to place the pressure on yourself - "it will be better for me if you balance yourself a little bit, instead of me trying to ride the input levels". If they still are not adjusting their position, you might have to be a bit firmer. However, if they are very young teenagers, you will simply have to ride the input manually so as to not overload the channels. The goal here is to get a great performance from a singer who is comfortable. If they can't understand "good mic technique", forget about it and move on. You're not going to educate them about this in one session.

IV. EDITING - GETTING CREATIVE

WALKTHROUGH #1: MAKING A DOUBLE TRACK FROM ONE VOCAL:

Step #1: If your singer can double themselves (sing the same thing again), it makes a killer sound for sections of the song where you want the vocal to sound 'bigger'. However, if they can't do it you can make a double quickly and easily. First, duplicate or copy the first vocal onto another track.

Step #2: Now move this new track forwards about 25 ticks. (if you're working at 960pps). You'll have to vary this according to the tempo of the song. If it's a slow tempo, 25 ticks may be too much - if it's a fast tempo, you might need to move the vocal as many as 40-50 ticks. It's all dependant on what type of sound you're after.

Step #3: Then detune the new track about -3 cents using the fine tuning adjustment of your software. Do not use destructive editing for this, because you don't want to commit to this detuning until you get to the mixing stage. You'll have to use your judgment about how loud to mix the double in with the original. Play with the levels until the double sounds natural, not electronic.

You can also use this technique to create a triple, but move the triple even further away than the double, and tune it sharp instead of flat. Pan the double slightly to the right and the triple slightly to the left.

WALKTHROUGH #2: MAKING A COMP FROM MANY VOCAL TAKES

Step #1: Label about five or six tracks as "take #1", "take #2", etc. Record the first vocal onto track #1. Even if you have to stop and punch in, keep all the takes on that track. When you have a complete take, mute that track on the track itself. Give the singer a minute or two to rest between takes.

Step #2: Record the second track, mute that, record the third, mute that, etc. Keep doing that until you have recorded about five or six takes. After that the performances will start to deteriorate, so it's pointless to keep adding on tracks. Mute all of the various takes.

Step #3: Make sure you have sectioned off and labeled the verses, chorus, bridge, solo, vamp, etc. Make a slice on all the takes where there is space at the beginning and end of each of those sections. The slices will be different for each track depending on what the singer was doing on each of those tracks.

Step #4: Mark the beginning and end of each section as a looped part. Then play each section, and unmute and listen to each take one at a time. Make a note of which take is the best for each section. You may have to make slices in between lines or words - whatever yields the best performance. Use your cross fade tool when you splice between sentences to alleviate any clicks or pops.

Step #5: Take all of the preferred takes (the unmuted tracks) and copy them to another track. Call this "Vocal Comp". Mute and disable all of the various takes until you are sure you are happy with this vocal comp. You might have to overdub certain lines if there wasn't a great choice between the original tracks.

Step #6: Solo this comped vocal. Listen carefully to make sure there are no clicks or words that are getting cut off. This is where the cross fade feature of your software really becomes useful. Crossfading can smooth out the transitions between vocal lines that are edited together. Read carefully the manual for your particular software regarding cross fading. There are many variations, and each one will be useful in different situations. You can also lengthen or narrow the cross fades depending on how it sounds. Remember to ALWAYS listen with your ears, NOT your eyes. Even if an edit looks funny or wrong it may sound great. The sound should always be the determining factor. Adjust the levels of the various sections of the comped vocal so that they maintain a balanced level. Maintain a musical consciousness when editing, not a technical one!

V. MIXING

NINE STEP WALK THROUGH:

Step #1: Start by setting up a few lead vocal subgroups. This is where all the lead vocal tracks should be assigned to output from. The main vocal can come out of subgroup #1 (label it as such), the doubled vocals can come out of subgroup #2, and any special FX vocals can come out of #3, etc.

Step #2: Insert some effects sends on each of these subgroups. Start with a long reverb, a delay, a chorus, and a second reverb of a shorter length. You'll have to set these individual effects up in the effects section of your software. (It's a good practice to have these set up in advance as part of your template.) But do not set the send level of these effects just yet. You'll do that in a later step.

Step #3: Insert a compressor on each vocal track. Start with a gentle setting of about 3:1, with a medium attack and a slow release. Depending on the style of music, you might want to compress the vocal to extreme limits. Compare your sound to other recordings that are in a similar vein.

Step #4: Add a parametric equalizer to each of the vocal tracks after the compressor. Start by boosting at around 10-12 kHz, 100 Hz, and 250 Hz. The low frequencies will add richness to the vocal; the upper frequencies will add presence and air. The lower mids will add fullness. However, if your vocal is already very full sounding, you might want to cut at these same frequencies. Adjust until the vocal sits nicely with the rest of the track without having to be turned up too loud.

Step #5: At this point you'll want to insert an Auto Tuning plugin, either on the vocal comp track or on the subgroup for the main lead vocals. This will be set to a general setting just to catch any slightly out of tune notes that you haven't individually fixed in the editing process.

Step #6: On the vocal subgroup you are keeping for special effects, you might want to assign a distortion plugin, or an extreme flange, or extreme eq like a telephone voice, etc. Take some pieces of your main vocal, copy them to a separate track, and assign that track to this subgroup. Insert some sends going to delay and reverb. Move those various special fx pieces away from the lead

vocal so that they answer various words. Pan those tracks to the right or left and turn them down in volume relative to the main vocal.

Step #7: Turn on the automation for the individual vocal tracks. Write the levels in so that the vocal is loud where it needs to be and not so loud in other places. Depending on the performance, you may need to boost various individual syllables and words.

Step #8: After you have the vocals at your desired levels throughout the song, it's now time to start adjusting the various effects sends for your tracks - to the reverb, chorus, delay, etc. Begin with less effects, and increase the amounts to your taste. You might also want to automate the effects sends so that, for example, there is more reverb on the chorus' than the verses.

Step #9: If you find that the vocal is not sitting nicely in your mix, start turning off the background vocals, solos, and any extraneous parts until you have a very basic and simple mix. Adjust the vocal relative to this mix, and then slowly bring the other parts in. In the "old days" engineers would often start with this process, but nowadays the mix is often very close by the time you arrive at the final mix stage. The wonder and advantage of computers!

VOCAL RECORDING TIPS:

01. ALWAYS take notes about the session! Write down what equipment you used to record, including signal path through outboard gear. Take down the names of ALL singers. Note the tempo, key, date of session, name of song, client's name, producer, arranger, etc.. Write down EVERYTHING! You won't ever regret this! Keep these notes with the song data AND print a hard copy and file it.

02. Avoid cutting off breaths. These noises really make the vocal sound natural. Taking them out will result in a very artificial sounding mix. Obviously, if the singer is mumbling or spitting in between lines you'll want to remove these.

03. Make sure that the singer has herbal teas and honey available. And a microwave oven to warm the water. Teas and honey are very important so that a singer's throat doesn't get dried out when recording. A little liqueur is also a good thing to have on hand. Not to get drunk with, but to soothe any sore or dry throats. Sometimes you can't come back on a different day.

04. Have fresh water available as well, at room temperature and cold.

05. Always have notepads and pencils for both the singer, the engineer, and the producer/client.

06. A lyric sheet must be present for everybody, whether you are recording rap, dance, pop, country, rock, jazz. This is a necessity, from the initial vocal recording to the vocal comping to the final mix.

07. Make various mixes with different vocal levels. Mark them “lead vocal loud”, “lead vocal lower”, etc. Oftentimes what vocal level sounds good after hours of mixing will not sound good the next day.
08. If you’re having trouble getting the presence you want on the vocal, try an enhancing plugin like the Aphex, etc. Although not as commonly used as in years past, they are sometimes exactly what is necessary to make a vocal stand out.
09. If you want a really cool effect, send the vocal out to a guitar amp, mic that and record it to another track. Instant Peter Gabriel-type coolness.
10. Use a vocoder on certain spoken sections. Yes, we know it’s been done to death but it works.
11. Here’s another FX that never seems to go out of style - the Cher fx from “Believe”. This is where you turn the sensitivity on the AutoTune plugin all the way up, and set the speed to very, very fast. Every note gets a quick leap to the correct pitch. Then send that to a Vocoder. It’s an FX still hears on a few releases every month - it’s up to you to find a new innovative way and place to use it.
12. Ah yes, let’s not forget the all time favorite vocal fx - distortion. Whether it’s Justin’s “SexyBack” sound, the White Stripes vocals, or something even darker and more sinister like Rage Against The Machine, it’s always an effect that gets people’s attention. It’s especially cool when you use it on certain sections only, not all the way through the song. Although “SexyBack” did sell a zillion copies didn’t it, with the FX on Justin’s vocal from beginning to end.

Oh well, just remember - there are NO rules! Record your vocals, have fun, and have lots of hits!