Choosing a VO Mic

Why it's *not* the most important decision you'll make when setting up your first home studio

by George Whittam

The most often asked questions on voice-over technology are microphone related, and for good reason**.** The microphone is the most important piece of equipment in your studio, besides your own vocal chords.

As a home studio consultant who works with voiceover actors exclusively, I get questions such as:

- What microphone should I buy?
- How much should I spend?
- Do I need to upgrade my microphone to compete?
- Should I have different mics for narration, promos, and commercials?

But questions I almost never get are ones most should *really* be asking:
Am I using my microphone correctly and does my room sound good?
Chances are the problems you face with your recorded sound have far less to do with the model of microphone or preamp you use than you might think. Other factors can have as much or more of an effect on your sound. **The biggest factors are mic placement and acoustics**. In this article we'll explore some different placement techniques and acoustics treatment solutions to get the sound you hear in your mind; that perfect studio quality recording you seek.

First let's get this out of the way... Yes, **some microphones are not suited for professional voice recording**. Generally, condenser microphones are best suited for the nuances of recording voiceover, as they are extremely sensitive and can pick up soft voices easily with low noise. If the noise floor is too high (that hiss you get in your recordings), the sound is dull and lacks clarity (often a problem with dynamic mics), or the fidelity is poor, perhaps it's time to investigate a better microphone. If all of those criteria seem to be met, the next thing people tend to look at is the mic preamp to make improvements. Some preamps also have processing built-in, but going right for the de-esser, EQ, or compressor tends to be a common mistake, just acting as a band-aid. I'll be straight with you: The pre-amp built right into your Mackie mixer or Mbox is usually *not* what's getting in your way.

Placement

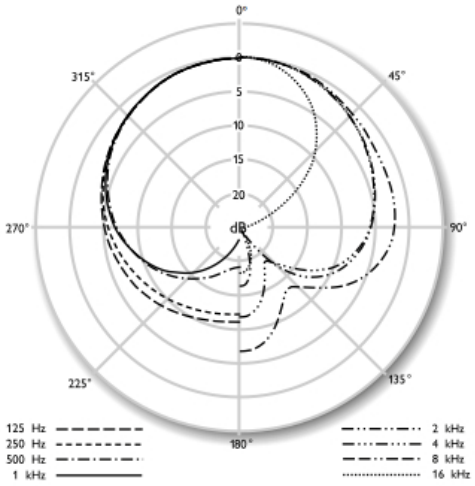
Did you know **you can make a $100 dynamic vocal mic, like the ever popular Shure SM58, sound better than a $3000 Neumann U87**, the most revered

mic of the voice-over world? Several years ago a blog post popped up discussing the findings of a studio that conducted a blind A/B test of the two mics. They created recordings of the same voice reading the same copy on the two mics, kept the models of the mics a secret as to not bias the test, and let listeners evaluate the recordings with one basic factor in mind: Which recording sample sounds more expensive?

In this particular case, **listeners voted overwhelmingly for the SM58.** The $100 utility mic beat out the $3000 German technological wonder! Without getting too geeky, I'll explain how the test was setup to manipulate the listeners to choose the cheaper mic. No, it wasn't effects, EQ, mic preamp, or other electronic means to modify the sound. It was simply the placement of the microphone.

An interesting property of cardioid pickup pattern microphones, the design most popularly used to record voice, is **proximity effect**. Once the microphone gets within a certain distance from the sound source, in this case your mouth, low frequency (bass) sensitivity starts to increase. Get right up on the mic and it makes your voice sound deeper, boomier, and sometimes muddled and less clear. Expert voice artists know how to use proximity effect to their advantage, and they also know when it just gets in the way. Want to sound dark, ominous, and mysterious? Bring your mouth up close to the pop screen, but speak more softly and keep hard consonants like P's and T's under control as to avoid **plosives** (the geek word for the popping the mic). Want to sound clear, clean, and natural? Back that mic away until the proximity effect no longer becomes noticeable. Back too far away and the mic starts to pick up too many **early reflections,** the sound of your voice bouncing off nearby hard surfaces. This tends to color the sound in a negative way, creating that "boxy" sound people associate with recording inside a small booth or closet without enough acoustic treatment. The effect is the result of **comb filtering,** which creates unintended and severe EQ dips and bumps at certain frequencies. More about this later when I cover acoustics...

As mentioned earlier, **plosives are a big problem when speaking too closely to the microphone**. They are caused by puffs of air slamming into the ultra-sensitive diaphragm inside the microphone grill. The **diaphragm** is designed to sense changes in air pressure created by the sound waves your vocal chords, tongue, and mouth produce, which is why it must be so sensitive. While pop filters can do a very effective job reducing or eliminating plosives, I often find moving the mic a few inches can make all the difference. **As long as the diaphragm is out of your air stream, you can't pop it.** Try placing your mic either off to the side 3"-4", but rotating the grill so that it still points toward your mouth. You'll be amazed how the sound is still very clean and natural, even though it's not directly in front of you. Even better, if your mic is suspended from above, raise it 4"-8" above your mouth and tilt the grill downward toward your chin. This allows it to not only avoid plosives completely without the need of a pop filter, but also pickup some of the sound that emanates from your resonating chest cavity. I find it works great with almost any sensitive condenser mic, especially with shotguns.



Another issue you can fix with a mic position adjustment are prominent "S's" or esses. Rather than futz around with a de-esser or EQ effect in your software or mic preamp, a mild essing problem can be handled by rotating the mic's diaphragm slightly off axis. What I mean by this is in the case of a side address (speak into the side) studio condenser microphone, such as a Neumann U87 or Harlan Hogan VO:1-a, simply rotate the mic inside the shock mount so the diaphragm is no longer pointed directly at your mouth but toward your cheek or ear. You will notice that the highest frequencies (treble) start to become reduced, and your esses less pronounced. This works because cardioid mics don't have the same frequency response **off-axis,** with the higher frequency sensitivity the first to decrease. Notice in the **polar pattern** diagram of the U87 that as the sound source moves around the mic, certain frequencies loose sensitivity faster than others, as indicated by the dashed lines. Keep turning the mic until you get the desired effect. Too much and you'll begin to sound muffled, so keep it reasonable. If your essing is severe, you might try a de-esser effect, or even a microphone with less of a treble frequency "bump", as many condenser microphones are designed with to make them sound "brighter" or more present.

Acoustics: Resonance

Every room has frequencies at which it resonates. Ever blow across the lip of a wine bottle and listen to it ring? For that size container, that's its resonant frequency. A typical closet or booth will have several of these resonant frequencies that will color the sound of your voice. The audible spectrum is the range of audio which science considers audible by humans, which covers a range from 20Hz to 20kHz**. The human voice is most prominent from 100Hz to 10000Hz.**

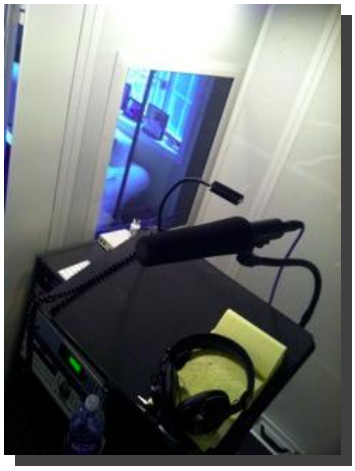
The larger the room, the lower its resonant frequency, just like a larger bottle has a lower pitch, and a bass violin needs to be larger than a violin to create a powerful bass note. A small space, such a linen closet, small walk-in closet, or an isolation booth from WhisperRoom, will resonate very heavily in the low to mid-range frequencies of your voice. This is partly what creates that "boxy sound", but there's more to the story (we'll cover that later). You'll have bumps in the frequency response from 200-400Hz to deal with, which can't be correctly effectively with EQ alone.

To remedy the problem you'll need to add a lot of thick, dense acoustical absorption in that already cramped space to compensate. These are called "bass traps" because they are designed to soak up low frequency sound. **Once treated properly, a small booth can sound pretty good, but never as natural as a larger space**. A walk-in closet with a lot of clothing does a nice job of this because the clothes are very thick and dense.

Bass trapping isn't often a major problem in a typical bedroom studio, especially if that bedroom has a bed! The mattress of a bed acts as a giant bass trap. But what if you don't want a bed in there? The next natural bass trap is the closet. If your closet has open louvered doors and is full of clothes, there's your bass trap. If you still have troubles, you'll need to install acoustical absorption to handle the resonance. Corner bass traps are the most popular because you get the most bang for your buck. ATSAcoustics.com makes a very affordable and effective bass trap (no, I don't get kick-backs from ATS, they're just my favorite tool for the job).

Acoustics: Reflections

Echo is the most commonly understood type of acoustical reflection. The sound of your voice bounces off something else, and returns back to you. Echo starts to turn into reverb when it becomes more complex and diffuse. While it may be appropriate to sound like you are in a bathroom when recording a commercial VO for bath soap, the production choices are not your decisions to make. Reverb, echo, and room ambience can't be removed from the recording later. There is no effect or filter for that, no "undo".



The worst case is a room with no carpet, no drapery, and spartan furniture.
Lots of objects in a room break up the reflections, keeping them from returning to your microphone too quickly and directly. Soft upholstered furniture, heavy drapes, plush carpet, and loaded bookshelves all really improve the sound of the room. Any hard surface within a few feet of the mic must be covered with absorption. Placing your mic near a corner heavily dampened with acoustical panels may be all you need to create a very nice, open sound without being overly reverberant.

Small booths should be free of any hard surfaces, if at all possible. A booth with a window poses a potential issue unless the mic is placed just right. Ceiling and walls should be mostly absorbing to keep what are called "early reflections" from reaching the mic. **These early reflections are what mostly contribute to the aforementioned "boxy sound".** Even a computer monitor or copy stand placed close the mic can be a

problem, unless angled to deflect the sound of your voice away from the mic. Think of it like a game of pool and you're lining up the cue for a bank shot, except in this case you are looking to *avoid the bank shot.*

Does all of this information have your head spinning?

To summarize:

1. Start with an affordable condenser microphone that doesn't bust your budget. I recommend a USB mic for your first setup, such as the Shure PG42USB (as seen here).
2. Create a space in which to use the mic with as much absorbing material you can find.
3. Experiment with placement to reduce proximity effect, plosives, and sibilance.
4. Once you've got a sound you are feeling is on the right track, pass it on to someone you trust for an objective listen and notes.

Not sure if the mic you've got is good enough or if your room sounds great? **Drop me an audio sample in my dropbox at vostudiotech.com/dropbox** and I'll be happy to take a listen to your audio. If there are no major problems with the recording, I'll send it back to you processed the way I think your finish audio file should sound, *free of charge*. If many problems exist, I'll let you know so you can pursue solutions.