

Vocal Cords: Removing Sibilance and Plosives

By [Cliff Goldmacher](#)

Removing sibilance (harsh “s” sounds) and plosives (boomy “puh” and “buh” sounds) from a vocal recording all begins with the microphone setup and the singer. The pop guard (or pop filter) is your first line of defense. Unlike the fitted foam covers often seen on dynamic mics—which can muffle or overly diffuse the sound of the vocal—pop filters are generally made up of a fine mesh stretched over a ring-like loop. This filter is then placed about six inches in front of the mic. Given that the cause of harsh sibilance and plosives is the way the air from the vocalist passes over the diaphragm of the microphone, these filters serve two purposes. First, they keep a little distance between the vocalist’s mouth and the mic, which lessens the effect of any “esses” or “puhs.” But, most importantly, filters actually serve to “break up” the energy and force of the breath coming from the singer. In most cases, this is enough to do the trick.

Another safety measure used to avoid sibilance and plosives has to do with the position of the microphone in relation to the singer’s mouth. Assuming you’re using a mic that’s hanging upside down, you can angle it slightly back and away from the singer’s mouth so that the vocalist is singing a little under and/or below the mic. Also, consider asking the performer to sing slightly to the right or left of the mic to avoid the problem of direct blasts of air hitting the diaphragm. Be careful not to make the singer too conscious of his or her mouth position, as this might come at the expense of a free and unfettered vocal performance. Ultimately, you want vocalists to focus on singing, rather than worrying about where to put their mouths.

But even the most careful recording techniques won’t be able to completely diminish artifacts from a vocalist whose voice is naturally sibilant. Likewise, some words naturally produce plosives, and, in some cases, no amount of mic/mouth positioning is going to totally neuter those little low-end concussions. In these instances, the wonders of hard-disk recording and signal processing offer simple and effective ways of removing unwanted noises.

De-Essing

A de-esser is essentially a frequency-specific compressor that can be set to minimize “s” sounds while otherwise leaving the vocal track unaffected. There are a few general settings on the de-esser to consider, and the main one is frequency range. In my experience, most harsh sibilance sits somewhere between 6K and 8K. The best way to pinpoint where the main part of the sibilance resides is to loop a particularly obvious sibilant passage, and then watch how many dBs of gain reduction your de-esser is applying to handle the problem spot. The greater the gain reduction, the closer you are to the “center” of the sibilance. Once you’ve found the problematic area of the frequency spectrum, your next job is to adjust the de-esser threshold so that you’re pulling out enough of the “s” to remove the harshness, but not so much that you’re dulling the vocal, or giving the singer a lisp.

Fader Automation

If you’re looking for a more detailed, incident-specific approach, you can automate fader moves for the sibilant spots. The key to this approach is to recognize what the sibilance looks like. As a rule of thumb, sibilance looks like a fuzzy football (Figure 1). Once you’ve found the proper spot, automate a volume dip of around 5dB or so. The result should sound natural, yet remove the harshness (Figure 2). Remember to make sure the overall vocal level is where you want it in the mix before you start automating the vocal fader, because once you begin the automation, your overall vocal level becomes essentially set where it is.

Waving Away Plosives

When it comes to killing plosives, my tried-and-true method entails editing the actual waveform. Just like finding sibilance, you need to know what a plosive looks like on the screen. The best way I know to describe it would be to say it looks like a combination of steep peaks and valleys right at the beginning of the word in question (Figure 3). The key here is to separate the audio region right at the beginning of the plosive, and create a fade that comes up steeply from there through the beginning of the word. You’ll probably need to experiment a few times to know how steep or gradual a fade to make, but, generally, it should cover the peaks and valleys of the plosive, and go a small way into the rest of the word (Figure 4).

Clean It Up!

To recap, the best way to handle sibilance and plosives is to avoid them to begin with. This starts with your mic setup and singer’s vocal approach. If, despite your best efforts, you end up with some “esses” and “puhs” that need removal, use the above methods to take away any distracting artifacts in your vocal. A final word of warning—it’s easy to overdo it when removing sibilance and plosives, so make absolutely certain the vocal sounds natural. You want the words to be crystal clear when you’re done mixing and editing.

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