

Microphone Technique

We all hear about “Microphone Technique”, but what is it, and why do we need it? Microphone Technique, specifically Vocal Microphone Technique, refers to how you hold (and possibly move) the microphone when singing. There are a number of reasons why you should hold the microphone correctly.

Firstly and most significantly, **correct placement of the microphone will yield the best possible reproduction of your voice** through the sound system. Microphone technique is key to a singer’s performance. And whether you want to admit it or not, all of you want to sound good, right?. Secondly, the sound operator will be able to get greater volume and therefore control of the sound from the entire group, as the sound will be less prone to “feed-back” – which is that annoying squeal which can occur with P.A. systems.

Best Placement:

The end without the cable points towards your mouth, pointing straight in and pretty close. OK, so that’s an over simplification

Quite simply put, the best possible placement for a modern vocal microphone is between 5 and 10 centimetres from your mouth, with the microphone angled slightly from horizontal so it points up towards your mouth. In other words, if the mic is more than the width of your hand away from your mouth, it’s too far away!



Correctly Holding a mic - Lowest Angle



Correctly Holding a mic - Highest Angle

Why position the mic that way?

There are a number of answers to this question.

1. Microphones are deaf. They are not sensitive devices. Imagine speaking to someone who is hard of hearing – what do you do? You raise your voice (ie vocal projection) and you speak more closely to their ear so they can hear you better. This is what you need to do with a microphone. Also when you move the mic away from your lips, the sound operator must turn up the volume on your mic so you can be heard, and as a result, more outside sound (other than your voice) enters the mic.. When the sound from the speakers enters the mic, it is fed back into the amplifier and in a split second it builds into the ear-splitting screech we know as feedback.

2. Proximity effect. The human voice is prone to proximity effect. What happens to your voice when you are calling out to someone at a great distance? Not only do you lose volume in your voice, but the tonal quality changes also. If you’re yelling across a field, the person at the other side hears your voice more like what you’d hear at the end of a telephone line – all the bass sound is gone, so is the sibilance of the trebles, and you’re left with this mid-range, nasal sound. To combat this, you’ll need to keep the mic fairly close to your mouth. Note however that if you have it too close, the diaphragm inside the microphone will be affected by your breath and you’ll have a “popping” sound on “P” and “T” sounds – and this is undesirable. But remember that the microphone is deaf, which makes it more prone to proximity effect. There is a mathematic explanation for this: **The law of inverse squares**; if you hold your mic 1cm from your lips it receives a given amount of sound energy from your voice. Move it twice as far – 2cm – does it receive half as much energy? No; only one fourth as much! That extra centimetre takes away three quarters of the efficiency of your sound system!

3. Microphone Polar Pattern or Sound Impact angle. We want the greatest amount of sound to be collected by the microphone. The diaphragm of the mic is (obviously) in the top of the mic and is at right-angles to the body of the mic. It has a “Polar Pattern” which means it picks up the most sound in a straight line in front of it. Sound comes out of your mouth in much the same way as something being spat out of your mouth. It comes up your throat from your vocal cords, hits the roof of your mouth which arches the sound at a slightly downward angle which continues once the sound passes your lips and heads towards the floor once it’s out of your mouth. We want as much of this sound to get into the top of this deaf microphone as we can, so you’ve got to place the mic at such an angle as to catch the sound (ie the same angle as the mic’s polar pattern). If you place the mic vertically under your chin, you will only catch a part of this sound, as it’s impacting the diaphragm at the wrong angle and won’t be captured as effectively.

Physical Holding of the Mic itself

Grasp the microphone firmly, but be aware that where you physically place your hand on the mic can affect how the mic picks up the sound, and so carefully positioning your hand is important.

- Hold the microphone so that there is a space between the top of your hand/ fingers and the back of the microphone's head. Your hand can create sonic reflections into the head of the mic which can alter the tonal quality of the sound picked up by the mic.
- Likewise, don't cup your hands around the mic's head as this will affect the tonal quality of the sound produced by the mic.
- On a Radio Microphone, do not hold it right down at the bottom end, as the bottom 1/4 of the mic's body is where the transmitting antenna is located – and covering this will affect the radio signal and introduce interference.
- In between songs, hold the microphone vertically at about chest level so it won't create a feedback problem. (some sound techs will refuse to unmute singers that don't do this. this rule is for during practice as well)
- For the best sound quality from the microphone, hold it with only your finger-tips. This is not recommended as it increases the likelihood of dropping the mic, but it removes the sound reflectivity of your hand from behind the head of the microphone which results in a better quality of sound.

Microphone Movement.

You can't, and shouldn't keep the mic in one position throughout the entire performance. You will need to move it around. But bear in mind the angle of the sound being projected from your mouth and keep the mic in line with it.

Movements which are acceptable include:

- Pulling away from the microphone on high, loud notes.
- In their weaker ranges, holding the microphone right next to your bottom lips.
- Pulling away when you want to fade or decrescendo.
- Putting the microphone closer to your mouth when you wish to get louder or crescendo.
- Getting even closer when your voice needs more presence or when you want to incorporate a breathy sound. Note that you will have to adjust your consonant sounds if doing this to avoid the popping caused by "P" and "T" sounds.

These movements require practice, but will add more impact to your performance. They should also be tested in the sound check before the performance commences.

Once in a while, you may even want to switch microphone hands, but only after a complete line.

A Few Don'ts.

- You are discouraged from covering or cupping your hands over the head of the microphone. This creates a muffled sound and increases the chance of severe feedback.
- Don't go screaming into the microphone at close range – this can cause distortion in the sound system, as it has been set-up for your normal vocal level.
- Don't go swinging the microphone by its cord – performers who do this as part of their show have reinforced cables.
- Hold the mic steady in the desired position. You are not going to achieve a consistent vocal if you are waving the mic around causing volume levels to drop in and out, and it only takes a fraction of movement away from the microphone for sound levels to vary.
- Don't drop the mic. Definitely the worst thing a singer (or anyone) can do to a mic is drop it! The problem is not physical damage to the mic. Any decent pro quality mic should be able to handle a decent drop every now and then, and although damage is a possibility – especially with older microphones, the biggest problem is the massive spike produced by the mic when it hits the deck. This spike is quite capable of overloading mixers and/or amplifiers, and possibly damaging loudspeaker drivers.
- Don't under any circumstances point the mic at your nose, or allow it to drift above your mouth – this will not only bring a nasal quality to the sound, but will increase the risk of feedback.
- Don't point the mic at a speaker, or drop it to your side and inadvertently point it at the fold back speakers – this could cause feedback.

Practical Example.

Microphone spheres or Proximity Boundaries

Imagine that your microphone is surrounded by three “spheres” or “regions of pick-up” – The first one quite small and close to the head of the mic, the second bigger, but still comparatively small, and finally a larger one again, all centred around the head of the mic. Now imagine the boundaries between each of these spheres. There is a noticeable change in the audio received by the mic as your mouth transverses the boundaries of these spheres.



Largest “Sphere” around a Vocal Microphone.

As the spheres are quite small, it is essential to keep your mouth within the boundaries of these spheres if the sound is to be consistent. If you move in and out of these spheres without control or without artistic reason, the sound will not be even. Certain spheres of the microphone are best suited to certain sounds. This is dictated by the proximity effect of your own voice and how it interacts with the microphone.

Sphere 1 - Bass boost

The sphere closest to the microphone, sphere 1, gives a bass boost. Low frequencies are amplified giving the voice body and nearness - even to a frail voice that would scarcely be audible acoustically.

If you add a lot of air to your voice in this sphere the high overtones blend with the bass boost and produce a rich, broad sound.

This sphere begins against the microphone head and ends roughly 3 to 5 cm away from the mic head.

Sphere 2 - Actual microphone sphere

Sphere 2 is where the majority of the work with a microphone is done. In this sphere all sound is amplified all the time but the power is governed by how far from the microphone the mouth is. If you sing powerfully you must pull back a little from the microphone to avoid a distorted sound. If you sing less powerfully you must be closer.

This sphere begins after sphere 1 and ends roughly 10 to 12 cm away from the mic head.

Sphere 3 - Acoustic sound

Hold the microphone far away so that you hear your voice as acoustic rather than amplified. Now slowly bring the microphone closer and notice where you begin to hear more amplified sound than acoustic sound. This is where you are leaving sphere 3 and entering sphere 2. Singing in sphere 3 does give you some amplified sound, ranging from a little to none at all. When there is no amplified sound left the microphone is so far away that the sound can only be heard acoustically. It is useful to be familiar with sphere 3 if you want to bring an acoustic element into a song.

This sphere begins after sphere 2 and ends roughly 25 to 40 cm away from the mic head.

It is not complicated to develop good microphone technique; it just requires plenty of practice in adjusting the microphone to the volume and desired sound.

Fold back Requirements.

Singers:

When working with amplified sound, the voice you are hearing through your own ears is never what the audience is hearing through the PA system. So you generally have a distorted perception to begin with.

This is the reason for Fold back speakers. They are to give you a perception of what the audience is hearing.

Note however that your fold back will not be everything which the audience is hearing.

Things you should identify in your fold back mix

1. Yourself. You should be able to hear yourself clearly in the mix. This may be difficult if your fold back is shared with others (eg multiple singers), but mixing your own sound you hear in your head with the sound you can hear from the fold back should help you distinguish your own voice amongst the sound.
2. The Primary Instrument. This may change throughout the course of the service. Sometimes it will be the guitar, sometimes the keyboard or piano. Whatever the case, it should be whichever instrument allows you to "pitch" your voice correctly. If you can't hear it, you'll have problems singing on-key.
3. The Song Leader. You will need to hear the song leader to receive vocal queues.
4. Other singers you're harmonizing against.

That's all you should hear in your fold back. If you hear anything else, it will become difficult to identify yourself in the mix. Speak with the sound operator and have the fold back mix tuned to suit.

Musicians:

Your fold back mix is primarily for communication, both verbal and instrumental.

Things you should identify in your fold back mix

1. The Song Leader – this is to hear the vocal queues in the song.
2. The Music Director – if the M.D. has a microphone, you should be able to hear them clearly above the mix whenever any calls are made.
3. Yourself. If you have an amplified instrument, you should be hearing the bulk of your instrument from the fold back, NOT your own amplifier. Your amplifier is there to supply a signal to the sound operator, not to create a louder sound than the entire P.A. system! However, you can use your amplifier to reinforce the sound provided by the fold back, thus providing you with a louder sound around where you standing.
4. Other instruments which you require. This must be discussed with the sound operator. You shouldn't get an entire mix of all instruments, but only those instruments you need to hear, for example, the bass guitarist may need lead guitar and vice-versa.