

POPULAR MIC TECHNIQUES FOR STUDIO RECORDING

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Nothing has more effect on the sound of your recordings than microphone technique. For example, which mic you choose -- and where you place it -- affect the recorded tone quality. That is, mic technique affects how much bass, midrange, and treble you hear in the monitored sound of a musical instrument.

Mic choice and placement also affect how distant the instrument sounds in the recording, and how much background noise you pick up.

This guide suggests some popular ways to place mics to record musical instruments. These are just starting points to get you in the ballpark. They work well in many cases, but if you don't like the results, feel free to change the microphone or its placement.

Other engineers have different opinions on mic techniques -- there are no rules. If a mic and its placement sound good to you, that's reason enough to use them.

What if you place a mic as described below, but you still hear too much room reverb or leakage? Place the mic closer than recommended below, and roll off the bass if necessary at your mixer to obtain a natural timbre.

Many of the techniques suggested here apply when the instrument or voice is recorded alone, as for an overdub.

This guide mentions several types of microphones:

FLAT CONDENSER MIC: A condenser mic with a basically flat frequency response. The mic has either an omni-directional pickup pattern or uni-directional pattern (such as cardioid). If you don't own a flat condenser mic, use whatever you have.

FLAT DYNAMIC MIC: A dynamic mic with a basically flat response, either a supercardioid moving-coil mic or a bidirectional ribbon mic.

CARDIOID DYNAMIC MIC WITH A PRESENCE PEAK: A dynamic mic with a cardioid pickup pattern, and a rise in its response around 5 kHz, which adds definition or "presence."

MINI MIC: A miniature condenser mic with an omni pickup pattern. There are uni-directional mini mics, but this guide refers just to omnis.

BOUNDARY MIC: A mini condenser mic -- omni or uni-directional -- that is mounted flush with, or very near, a flat plate. Such a mic is intended to be used on a surface.

With this background, let's look at some typical studio miking methods for vocals and instruments.

VOCAL

~ Place a flat condenser mic 8 inches away at eye height to avoid breath pops.

~ Or place the mic at mouth height and mount a hoop-type pop filter a few inches out front.

SINGING GUITARIST

~ Mike the singer up close using a cardioid dynamic or condenser mic with either a flat mic or a mic with a presence peak. Add a foam pop filter. Turn down the extra bass with your mixer's EQ. Put a similar mic near the guitar, aiming at the fingerboard about 3 inches away, about 3 inches to the right of the sound hole. Turn down the extra bass with your mixer's EQ.

~ Best-sounding method: Record the guitar first, then overdub the vocal with a flat condenser mic.

~ Record the vocal and guitar with a single flat condenser mic (or stereo mic or stereo pair) midway between the mouth and guitar. Adjust mic height to control the balance between guitar and voice.

~ Use a mini mic or pickup on the guitar and a cardioid mic on the vocal.

~ If the voice sounds filtered due to delayed leakage into the guitar mic, delay the vocal track about 1 msec.

ACOUSTIC GUITAR

~ Attach a mini omni mic to the guitar soundboard, halfway between the bridge and the sound hole, 1/2" from the low E string, not under the strings.

~ Place a flat condenser mic 6 to 12 inches from where the fingerboard joins the body. For stereo, add another mic the same distance from the bridge. For more isolation, mike 3 inches from the end of the fingerboard.

SAX

~ Place a flat condenser or flat dynamic mic 18 inches away, a few inches above the bell, toward the player's right side.

~ Clip a mini mic to the top of the bell, and place the mic to pick up both the bell and the tone holes.

ELECTRIC GUITAR OR ELECTRIC BASS (RECORDED DIRECT)

~ For a clean sound, plug the guitar into a direct box. Plug the direct-box output into a mixer mic input. For a distorted sound, plug into a guitar signal processor. Plug the processor output into a mixer line input. Or record direct, and use a guitar-amp modeling plug-in.

ELECTRIC GUITAR AMP

~ Place a cardioid dynamic mic with a presence peak, or a ribbon mic, 1 inch from a speaker cone, slightly off-center. For the brightest tone, place the mic near the center of the speaker cone. For a mellower tone, place the mic near the edge of the speaker cone.

SYNTHESIZER OR DRUM MACHINE

~ Using guitar cords, connect the synth left/right outputs to two line inputs on your mixer.

~ Plug a guitar cord into each output. Connect each guitar cord to a direct box. Connect each direct-box output to a mic input on your mixer. On the direct box, flip the ground-lift switch to the position where you hear the least hum in the monitored signal.

LESLIE ORGAN SPEAKER

~ Place a cardioid dynamic mic with a presence peak a few inches from the top louvers. Use two mics angled apart for stereo. Add another mic on the lower bass speaker. Turn up the organ fairly loud to override the rotating-horn noise.

~ Place a mini mic a few inches from the top louvers. Use two mics spaced apart about 1 foot for stereo. Add another mic on the lower bass speaker. Turn up the organ fairly loud to override the rotating-horn noise.

DRUM SET (TOMS AND SNARE)

~ Place a cardioid dynamic mic with a presence peak about 1 inch above the head, 1 to 2 inches in from the rim for toms or even with the rim for snare, angled down about 45 degrees. Clip-on drum mics are another alternative. Tune the heads with equal tension all around. If the drum rings too much (unlikely), tape some gauze or a folded handkerchief to the head, or use damping rings.

DRUM SET (CYMBALS)

~ Using one or two boom stands, place flat condenser mics 2 to 3 feet over the cymbals. The mics can be spaced 2 to 3 feet apart, mounted XY style for mono-compatible recording, or angled 90 degrees and spaced 11 inches apart. Or use a stereo mic.

DRUM SET (HI-HAT)

~ Take a flat condenser mic with low-frequency rolloff, and place it 8 inches above the outside edge of the hi-hat aiming down. Usually the snare mic and overhead mics pick up enough hi-hat.

DRUM SET (KICK DRUM)

~ Remove the front head or go inside the hole cut in the front head. Inside, on the bottom of the shell, place a pillow or blanket pressing against the beater head. This dampens the vibration and tightens the beat.

Place a cardioid dynamic mic with a presence peak and a deep low-frequency response inside a few inches from the beater. For extra attack or click, use a wooden beater and/or boost EQ around 3 kHz to 6 kHz. Cut a few dB around 400 Hz to remove the papery sound.

DRUM SET (SIMPLE MIKING)

~ For jazz or blues, sometimes you can mike the drum set with one or two flat condensers (or a stereo mic) overhead, and another mic in (or in front of) the kick. You may need to mix in another mic near the snare drum.

~ Clip a mini mic to the snare-drum rim over the drummer's right knee. Position the mic in the center of the set, about 4 inches above the snare drum. With a little bass and treble boost, the sound can be surprisingly good. Put another mic in the kick.

METAL PERCUSSION

~ Place a flat condenser mic or mini mic about 1 foot away.

BONGOES OR CONGAS

~ Place a cardioid dynamic mic with a presence peak midway between the drums a few inches away. Or mic both drums up close.

AMBIENCE

~ Tape one or two boundary mics (such as PZM's) or mini mics on a distant wall or on the control-room window. Do not cover the front of the mini mic with tape -- it will muffle the sound.

AUDIENCE

~ Place two cardioid condenser mics on either side of the stage, on mic stands, aiming at the back row of the audience.

~ Hang the mics high over the front row of the audience.

~ Tape two mini mics onto the ceiling over the audience about 3 feet apart, or tape a mini mic on the left wall and right wall.

GRAND PIANO

~ Raise the lid. Tape a mini mic or boundary mic to the underside of the lid in the middle. For stereo, use two mics: one over the bass strings and one over the treble strings. If you need more isolation, close the lid and tweak EQ to remove the tubby coloration (usually you need to cut around 250 Hz). You might boost at 10 kHz for clarity.

~ Raise or remove the lid. Place a flat condenser mic 8 inches over the treble strings, about 8 inches horizontally from the hammers. Place another flat condenser mic 8 inches over the bass strings, about 2 feet horizontally from the hammers. Aim both mics straight down. You might boost a few dB at 10 kHz for clarity.

~ For a classical-music solo, place a stereo mic or a stereo pair of mics about 7 to 9 feet away and 7 to 9 feet high. If you need to hear more room reverb, mix in a distant mic pair in the audience area, or add high-quality digital reverb.

UPRIGHT PIANO

~ Remove the panel in front of the player to expose the strings. Place two mics (usually flat condensers) about 1 foot from the bass and treble strings.

~ Face the soundboard toward the room (not next to a wall). Mike the soundboard a few inches from the bass and treble strings with two mics (ideally, flat condenser mics, but dynamic mics with a presence peak often work well).

~ Face the soundboard toward the room (not next to a wall). Mike the soundboard next to the bass and treble strings with two mini mics.

XYLOPHONE OR MARIMBA

~ Place two flat condensers or two mini mics 18 inches above the instrument and 2 feet apart.

BANJO

~ For isolation, tape a mini mic to the drum head about 2 inches in from the rim. Also try one over a resonator hole. To get maximum isolation and gain-before-feedback, tape a mini mic inside onto the dowel rod, and turn down the excess bass in your mixer's EQ.

~ To get the most natural sound with a mini mic, use a mic clip to position the mic about 1 to 2 inches from the drum head, midway between the bridge and rim.

~ Place a flat condenser or dynamic mic 6 to 12 inches from the drum head.

VIOLIN

~ Place a flat condenser or ribbon mic 2 feet over the top. If the music is bluegrass, country, or old-time, place the mic 1 foot over the top. Aim toward the f-holes for a warm sound, or toward the neck for a thinner sound.

~ For a fiddle player who sings, try a flat condenser or ribbon mic 1 foot over the fiddle, aiming at the player's chin.

~ For a bright sound, mount a mini mic between the bridge and tailpiece, under the strings. For a warmer sound, mount a mini mic near an f-hole.

~ For a classical-music violin solo, place a stereo mic or stereo pair of mics about 12 to 20 feet away.

MANDOLIN, BOUZOUKI, RESONATOR GUITAR, LAP DULCIMER

~ Place a flat condenser mic about 6 to 8 inches away from an f-hole or sound hole.

~ Mount a mini mic near an f-hole.

HAMMERED DULCIMER

~ Place a flat condenser mic about 12 inches above the top edge aiming at the soundboard.

~ Tape a mini mic onto the top surface.

ACOUSTIC BASS

~ Place a flat condenser a few inches in front of and above the bridge.

~ Tape a mini mic to the bridge.

~ Place a flat condenser a few inches in front of and below the bridge. Mix it with another flat condenser aiming at the plucking fingers.

~ For isolation and mobility, wrap a cardioid dynamic mic in foam (except for the front grille) and stuff it behind the tailpiece, aiming up. Apply EQ as needed.

BRASS

~ Place a flat condenser, flat dynamic or ribbon mic about 1 to 3 feet out front. Mike on-axis to the bell for a bright, edgy tone; mike off-axis to the bell for a mellower tone.

~ Tape a boundary mic to the wall or to the control-room window.

WOODWINDS

~ Place a flat condenser about 12 inches from the tone holes.

~ Rubber-band a mic clip onto the instrument in the center. Position a mini mic a few inches from the center of the sound column.

FLUTE

~ Place a flat condenser halfway between the mouthpiece and the tone holes, about 6 to 12 inches away.

~ Tape the cable of a mini mic halfway between the mouthpiece and the tone holes. Extend the mini mic about 1 inch above the flute.

HARMONICA

~ Place a flat condenser mic or mini mic 8 inches away.

~ For a dirty, bluesy sound, mike up close with a handheld cardioid dynamic mic. Or plug a handheld mic into a guitar amp, and mike the amp.

HARP

~ Aim a flat condenser mic at the soundboard about 18 inches away.

~ Tape a mini mic to the sound board. Experiment with placement near a sound hole to get more bass.

BAGPIPE:

~ Mike the chanter about 8 to 12 inches from the fingers with a flat condenser mic or mini mic. Mike the drone pipes overhead with a flat condenser mic or mini mic.

ACCORDION, CONCERTINA

~ For recording, place a flat condenser mic (or two for stereo) about 12-18 inches out front.

~ For PA, tape a mini mic onto the tone holes on each side (two mics total). Or tape the cable of each mini mic to the top so that each mic hangs down over the tone holes.

~ For PA, rubber-band a mini mic onto each wrist.

OPERA, MUSICALS

~ Use two or three unidirectional boundary mics on the stage floor, in a line about one foot from the edge of the stage. Also try omni boundary mics such as PZMs.

There you have some suggestions for placing and choosing mics for recording. After trying them out, invent your own techniques. You can use almost any mic or placement on any instrument if it sounds good to you.