

ProSoundWeb EXPERT SERIES



MICROPHONE APPROACHES FOR ACOUSTIC PERFORMANCES

Chapter 1 of 6: Microphone Expert Series

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AUDIX



A BEAUTIFUL SONIC TREAT: MICROPHONE APPROACHES FOR ACOUSTIC PERFORMANCES

Capturing and amplifying those natural tones without hype or feedback.

By Bruce Bartlett

Take a breath of fresh air on a country morning. That's the sensation you get from a well-amplified acoustic ensemble.

Guitar, upright bass, mandolin, dulcimer, banjo – all produce a sweet, airy sound that can be captured with the right approach. Acoustic music heard over a sound reinforcement system is all about beauty and naturalness, not hype.

Listen to a number of well-recorded CDs of old-time country, bluegrass and acoustic jazz. In most cases you'll hear no effects except some corrective EQ and maybe just a little reverb.

Let's look at some ways to capture that delicate sound and prevent feedback.

Picking It Up

An acoustic instrument can be picked up in four ways: with a microphone on a stand; with a contact mic; with a pickup fed into a preamp or DI box; and with a distant large-diaphragm condenser microphone (LDC).

A good mic choice for acoustic instruments are small-diaphragm cardioid condenser models. The cardioid pattern reduces feedback, while the condenser transducer captures a detailed, accurate sound, in which you can hear each string within a strummed chord.

Some musicians might prefer a contact mic, which is a miniature clip-on condenser type like a lavalier (Figure 1). The advantages are consistent sound from gig to gig, an uncluttered stage, and freedom of movement. The musician is not tied to a single position near a stand-mounted mic.

Other musicians might prefer a piezo or magnetic pickup. Sensitive only to string vibrations, it has more gain before feedback than a mic, and total isolation. However, this produces an “electric” rather than “acoustic” sound, missing the resonance of the instrument’s body and air chamber.

Some EQ can help – try a narrow cut at 1.2 to 1.5 kHz, along with some high-frequency roll-off. Pickups also prevent phase cancellations between two mics deployed for a singing guitarist.

More Methods

Hybrid systems combine a pickup with a contact mic, providing a blend of high volume from the pickup and “air” from the mic. Usually, the performer decides on the blend and polarity of the two sources.

Here’s a trick to prevent feedback with this configuration: Send just the pickup signal to the stage monitors, and send just the mic signal to the house loudspeakers.



Figure 1

Figure 1: A contact mic on a fiddle.

In the mixer channel for the pickup, turn down the fader and turn up the monitor send. In the mixer channel for the mic, turn up the fader and turn down the monitor send. The monitors don't feed back and the audience hears the true timbre of the instrument.

Because a pickup is high impedance, it needs to be loaded by a high-Z input, ideally about 1 megohms. Many active direct boxes can provide that input impedance, but most passive (transformer-coupled) DIs do not. They load down the pickup and result in a dull or thin sound. For this reason, many performers feed their pickup into a preamp with a high-Z input and low-Z output.

The single-mic technique can also be effective. One or two LDCs are placed on stage at chin height, with each picking up two to three musicians who balance themselves acoustically by moving toward or away from the mic. This method looks "old-timey" while the musicians' choreography (weaving in and out) adds visual interest.

Of course, you lose control of the mix. But many musicians prefer to work that way, rather than relying on a sound mixer who may know only how to mix rock 'n' roll. (Acoustic music can be a whole different animal.)

It's good practice to use a high-pass (low-cut) filter on each mic channel to reduce low-frequency rumble and feedback. As the musician is playing, start with a very low filter frequency, raise it until the sound thins out a little, then back off.

Specifics & Experiments

Here are some suggested techniques for miking various instruments with a stand-mounted mic. As always, there's not a specific right way to handle this job – feel free to experiment and just do whatever works. That said...

Acoustic guitar: Place a mic about 3 or 4 inches away, just to the right of the sound hole as viewed from the audience (Figure 2). A mic directly in front of the sound hole makes a boomy effect because the sound hole resonates around 80 to 100 Hz.

If the amplified sound has too much bass or is too "thumpy," roll off some lows. If the sound is too harsh, cut around 3 kHz.

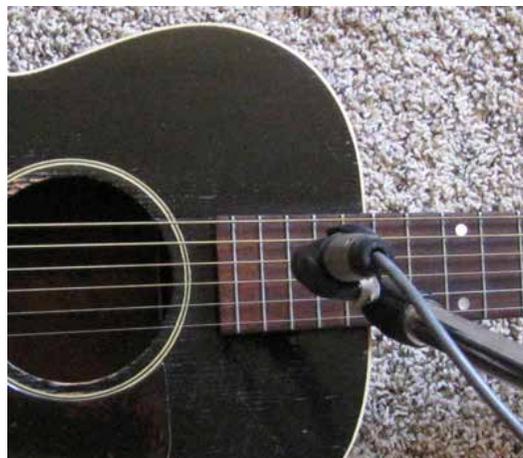


Figure 2

Figure 2: A guitar miking technique.

Fiddle: A mic about 8 inches over the bridge works well. Aim it toward the f-holes for a warmer sound, or toward the neck for a thinner sound. A singing fiddler can be mic'd with a single microphone aiming at the player's chin.

Banjo: Aim at a spot halfway between the bridge and the lower edge, about 3 inches away. If the sound is too hollow, the player can stuff a rag inside the banjo. You might also cut a little around 500 Hz.

Mandolin: Many mandos have a thin, harsh sound. You can warm it up by close-mic'ing the lower f-hole. Adjust EQ to taste.

Upright bass: An EQ'd pickup can be the best choice to prevent leakage and feedback. When mic'ing, avoid placing it directly over the f-hole because the sound there is muddy and hollow. A mic located a few inches under the bridge, aimed at the body, can capture a deep, tight sound.

You might mix in another mic close to the plucking fingers for definition, and roll off the lows in the pluck mic (Figure 3).

Hammered dulcimer: Place a mic about 8 inches over the front edge aiming at the center of the soundboard.

Lap dulcimer: Aim a mic down at a soundhole a few inches away.

Dobro: This instrument is basically a guitar held on the lap and played slide-style with a bottleneck. You can mic the soundhole a few inches away and roll off the lows if the sound is too bassy. Roll off some highs if the sound is too cluttered and bright.

Grand piano: Place one mic over the treble strings, 8 inches up and 8 inches horizontally from the hammers. Place another mic over the bass strings, 8 inches up and about 2 feet from the hammers (toward the tail of the piano). Of course, there are dozens of other grand piano miking methods, but this one has always worked very well for me. If the sound is tubby, cut a little around 300 Hz.

Upright piano: Aim two mics at the soundboard about 8 inches away, dividing the piano in thirds.

Small drum kit: Try an LDC overhead at forehead height or a little higher, plus a mic in the kick. Typical kick EQ is a cut around 400 Hz to remove the "papery" sound, and a boost around 4 kHz to clarify the attack. You might stuff a towel or blanket inside the kick to tighten the beat.

Flute: Aim a mic halfway between the mouthpiece and the tone holes. Use a foam pop filter to prevent breath sounds.



Figure 3

Figure 3: A bass miking technique.

Clarinet: Place a mic about 8 to 12 inches from the side.

Sax: Try to aim the mic so it picks up the tone holes and the bell. Aiming it too much at the bell only can produce a harsh, uneven tone. There are a variety of clip-on mics that work well for this application (Figure 4).

Amplifying acoustic music presents a different set of approaches and circumstances than the typical amplified rock show. But if you can capture the delicate sound of acoustic instruments, your audience is in for a beautiful sonic treat.



Figure 4

Figure 4: Clip-on mic on a sax.

AES and SynAudCon member Bruce Bartlett is a recording engineer, audio journalist, and microphone engineer. His latest books are “Practical Recording Techniques 7th Edition” and “Recording Music On Location 2nd Edition.”

About Audix Corporation

Audix is a U.S. manufacturer of high-quality dynamic and condenser microphones, as well as wireless microphone systems for the live sound, recording, and installation markets. From concept to completion, Audix’s on-site research and development team combined with an in-house manufacturing facility, enable them to proudly provide products from their headquarters in Wilsonville, Oregon.

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