

# ProSoundWeb EXPERT SERIES



## THE MYRIAD MIC APPROACHES FOR CAPTURING THE SOUND OF GRAND PIANO

*Chapter 4 of 6: Microphone Techniques  
Expert Series*

Sponsored by

**AUDIX**



## THE MYRIAD MIC APPROACHES FOR CAPTURING THE SOUND OF GRAND PIANO

**By Mark Frink**

Ask 100 sound engineers how to mike a piano and you'll get 99 ideas. The piano is the Mother of Musical Creation, the heart of most musical genres and every singer's lover, yet in live sound it's often replaced by digital synthesizers and samplers due to the inconvenience of a half-ton instrument that needs 230 strings tuned with a propensity to feed back and resonate with adjacent sound sources.

However, a piano's organic sound remains music's most popular keyboard, "hands down." My love affair with grand pianos was cemented two decades ago mixing Ralph Sharon's Steinway with its lid removed on Tony Bennett's Unplugged tour, where our unplugged look used a pair of small Countryman

Isomax microphones near the action, spaced low and high, while also relying on the spare vocal mic placed at the sound hole and a C-ducer contact mic underneath to beef up the monitors.

## Going Solo

Small diaphragm condensers (SDCs) or “pencil condensers” are obvious choices for open lid solo piano performances, whether used as coincident or spaced pairs due to their wide bandwidth, high headroom and flat response.

Common favorites include the Audix SCX-One, Neumann KM184, Shure KSM137, Sennheiser e614, though there are many to choose from. Large diaphragm condensers (LDCs) are even more popular, especially those with adjustable polar patterns that lend themselves to a wider range of options.

There are many ways to record or reinforce solo grand piano with the lid open. The Coincident Pair (XY) technique places matched mic capsules together but at an angle to each other, near the curved side of the piano. Spaced Pair is another popular method that booms one mic over the high strings with a second over the center of the mid and low strings.

Alternately a Spaced Pair can be positioned over the high and low strings near the keys to better represent the image heard by the player when panned. Three-mic variations combine high and low mics near the action, with a third mic where the low strings cross or further down the piano at its “toe.” Blumlein Pair is an old-school method employing two figure-of-8 (bidirectional) mics, with their capsules crossed at 90 degrees and placed near the piano’s curved edge, so one aims at the low strings and the other the high strings.

Mid-Side (MS) is a two-mic, three-channel technique, with a center-panned mic added to a figure-of-8 mic with its null aimed at the center and patched to two more channels panned hard left-and-right with one channel’s polarity reversed. These last two are often accomplished with either ribbon mics that are naturally bidirectional or pattern-adjustable LDCs, often C414s.

On k. d. lang’s symphony pops tour, we experimented with the lid opening and settled on a custom height determined by listening in the audience with the lid slowly raised and lowered while the band played, deciding on a height unavailable from the piano’s standard tall or short stick by employing a special 2-foot piece of wood we carried with us.

John Lewis of the Modern Jazz Quartet promoted another method for many years, using a Sennheiser MD 421 on a boom stand positioned almost touching the fully open piano lid, two-thirds of the way up, catching both the piano off-axis below plus the lid reflections in phase. Also, close-miking the soundboard from below the piano can be surprisingly effective after its sweet spot is located.

## Grand & Band

Recording engineers also know there are many ways to mic a piano, as long as it's in an isolation booth or room. All of these open-lid techniques provide little isolation from adjacent instruments, floor monitors or the main PA when used in rhythm sections with sound reinforcement.

A grand piano's open lid not only reflects sound outwards, but also directs outside sound back in. Even with its lid opening away from a nearby drum kit, drums can be heard almost as loud as the piano in the mics, blurred by the transfer of sound through the piano's resonant wooden structure and the reflections within.

Closing the lid requires mics to be placed much closer than would be optimal. Since much of the sound now arrives from off-axis, mics with an even polar response perform better. A few inches over the strings, the sound pressure inside a concert grand can be 130 dB, requiring high-headroom mics.

Heavy-handed EQ is often needed to remove boxy-sounding low-mids with the lid shut completely. Because a piano is a highly resonant acoustic instrument, channel EQ must be carefully cut in specific regions between 100 Hz and 1 kHz, sometimes requiring all four parametric filters on an input channel in addition to its high-pass filter.

An old-school live sound trick, especially in a rhythm-section context, is simply using a dynamic mic aimed at the sound board through a hole in the piano's metal frame on its curved edge, providing warmth and isolation with the lid closed. Road-dogs would lay a dynamic on a piece of foam, or wrap it in a sheet of foam, to make a short tunnel around its end that can squeeze into a piano's sound hole, looking into the hole at an angle so it fits below the closed lid.

A sound-hole mic can be combined with any of the condenser pair techniques, or just used alone for monitors. If the wedges are tuned for vocal mics, using another makes it easier to put it in the wedges without feeding back.

Closing the piano lid reduces the clearance above the strings to about six inches, favoring side-address condensers. Other popular side-address condensers include Audix SCX-25A, Audio-Technica AT4050 and AT5045, Shure KSM 32 and BETA 181, and Sennheiser MK4 and MK8.

The piano harp's cast iron frame holds 20 tons of string tension. The location and arrangement of its struts provide consistent locations for installing "gaffers-tape bridges" – an age-old method for mounting mics in a closed piano. They're installed by simply overlapping two pieces of tape across a pair of the piano harp's struts, making a horizontal sling for the mic, with another strip of tape on top to secure it.



*A gaffers-tape bridge.*

The center of the piano, where the low and low-mid strings cross over each other, is well served by two struts that are easily bridged. The high end of the piano has a strut between the high and high-mid strings that dictates the gaffers-tape bridge placement of the high mic.

Since the highest strings sound metallic when miked too closely and aren't played as much as the high-mid strings whose keys fall under the pianist's right hand, the bridge for the piano's high mic naturally goes across the high-to low-mid struts and provides attack from its proximity to the felt hammers.

End-address SDCs can also be used on gaffers-tape bridges as spaced pairs, though often placed more toward the middle while aimed toward the action. It's imperative to use high-quality tape, deploying two strips underneath the mic – especially with LDCs – and if the gig is at the same venue for more than a day, to go back and check, if not re-tape it daily.

As the tape dries out, which is common in air-conditioned halls, it can stretch or lose its grip. Anyone who's had a mic land on piano strings while it's being played will never forget the experience.

### **Getting Creative**

Some venues are particular about tape on their pianos. When visiting the White House East Room with Tony Bennett and opening its Mahogany Steinway, I was sternly informed that no tape was to be used. I pointed out that there was an awful lot of tape residue on the piano for that to be true, but was told it was "historical."

Another approach to mounting closed-lid piano mics was introduced to me by Greg Grecco: hardwood blocks with a notch cut out and a threaded mic clip flange. Fitting the blocks over the piano harp struts allows mics to be mounted and removed in a minute.

The Audix SCX-25A-PS is a matched pair of the company's LDC "lollipop mics" that come with small gooseneck clips for attachment to harp struts. These clips can be bought separately as well. There are also several Atlas clamp options that can be used to attach a mic clip to struts.

The DPA 4099P mic kit employs a magnet to hold a short, skinny gooseneck to any part of the piano's iron harp frame, allowing mics to be easily attached and quickly adjusted for optimal positioning. The DPA SMK4061 stereo mic kit also provides a variety of mounting accessories for placement in and on the piano, with either an open or closed lid.

Even with the lid closed, sound sources near the piano will get into the mics inside, coming in from the sides, the top, and up through the sound board underneath. A trick employed at several European jazz festivals simply borrows recording studio "gobos" or sound baffles to isolate the piano.



***The Audix SCX-25A-PS, a matched pair of LDC mics along with accessories, supplied in an aluminum road case.***



***A hardwood block over the piano harp to allow mic mounting.***

In lieu of these, I use the pair of empty road cases from the bass rig's 4 x 10 cabinets, placed upstage of the piano (and out of sight) to block sound, beefed up with a packing blanket and covered with Duvetyne (twill fabric with a nap on one side).

### **Picking Them Up**

Even with all of these tricks, piano mics often can't be used in floor monitors due to lack of isolation and gain before feedback, leading to the use of a piano pickup.

The dry, boxy sound of a piano pickup and the piano's wooden resonance requires lots of low-mid EQ. Rational Acoustics Smart Tools on an iPhone and an iPad-controlled monitor desk are very helpful.

The original Helpinstill pickups were a set of six magnetic bars that were mounted beneath the strings to pick up their vibrations in the same way as an electric guitar pickup, providing an "electric" sound that doesn't sound natural but helps in the monitors. Engineers often used the six bars with a small mixer onstage to reduce channel count and better balance and pan them to a stereo output.



***A Helpinstill pickup (magnetic bar) over the bass section.***

Helpinstill's newer Model 180 is comprised of three larger, different-sized magnetic bars that are better suited for the geometry of grand pianos, with two that sit below the mid and high sections and a third that suspends over the low strings.

Though supplied with a three-channel passive combiner, using individual DIs to bring them into three console channels allows engineers to balance and EQ them individually. Some supplement with only the low bar to make up for low-mid EQ that usually gets cut from mics in a closed lid piano.

The Barcus-Berry Model 4000 planar wave transducer is a piezoelectric pickup with feet. It's supplied with a preamp, but experienced users employ a Countryman Type 10 DI that's well matched to this high-impedance transducer. It's feet attach with tiny squares of double-side tape to the piano's soundboard, with many preferring placement in one of the sound holes.

---

*Mark Frink has served as monitor engineer for a host of top artists in a pro audio career spanning several decades.*

#### **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.*

**[www.audixusa.com](http://www.audixusa.com)**