

Royer R-122

A ribbon microphone for the 21st century

By Myles Boisen

Don't be surprised if you experience a flash of déjà vu when you see the R-122 phantom-powered ribbon microphone. Its look and design are inherited from the Royer R-121, a 2000 EM Editors' Choice winner. (For more specifics on the R-121 and an interesting historical sidebar on ribbon mics in general, check out my review in the May 1999 issue.)

Like the R-121, the R-122 uses a 2.5 μ ribbon with a conventional bidirectional or figure-8 characteristic. Adjacent to the mic's side-address grille, vertical fins indicate the pickup pattern's off-axis areas (or null points), located at 90 degrees and 270 degrees relative to the front of the ribbon (see Fig. 1). Also like the R-121, the R-122 comes in a burnished satin nickel or matte-black chrome finish, carries a lifetime warranty for the original owner, and is housed in an attractive cherry-wood box. The R-122 is 1.75 inches longer and a couple of ounces heavier than its predecessor, but the most crucial differences are inside its gun-barrel-size body.

Audio Activity

The Royer R-122's active circuitry—a phantom-powered FET amplifier stage coupled with a compact transformer—probably represents the most significant improvement to ribbon-mic technology in 50 years. Older ribbon designs require a mic preamp with ideal impedance specs, low noise, and lots of gain to deliver optimum sound. A classic RCA ribbon mic, for example, can sound stunning through a vintage tube preamp. Because of the way that the ribbon element is loaded by the preamp, however, such a mic might sound flat or noisy when it's connected to an average mixing console. The R-122's unique circuitry solves that problem and adds a healthy gain increase of approximately 15 dB, making it comparable to modern condenser mics in terms of output level.

According to Royer's Rick Perrotta, the heart of the active ribbon-mic system is a custom toroidal transformer that took a year of research to perfect. The transformer's high turns ratio is responsible for the aforementioned gain, but at the transformer stage, the impedance is too high to be usable. Consequently, the transformer's secondary windings connect to a pair of very-high-impedance, ultralow-noise FETs, which in turn feed bipolar emitter followers to provide the

necessary low-impedance output for a mic preamp. Because the active solid-state electronics act solely as impedance converters and do not perform any amplifying function per se, self-noise is extremely low.

Let's Active

When I'm miking stringed instruments, saxes, clarinets, brass, and electric guitar, a ribbon mic is almost always my first choice. During a month of jazz and original music sessions at Guerrilla Recording, I had a constant influx of those instruments to record. As soon as I brought the faders up on a pair of Royer R-122s—miking tenor sax and trombone for the jazzy local combo Married Couple—I knew that the mics would stay up on stands for many days to come.

On saxophone, routed through a Universal Audio 2-610 tube preamp, the Royer ribbon immediately sounded warm and smooth, but a bit too heavy on the low end. The figure-8 pickup pattern of the R-122 and most ribbon mics produces a disproportionate amount of bass response due to an exaggerated proximity effect. Moving the mic up and a few inches back from my customary close-miking position made for an airy, classic jazz timbre. In the mix, a slight boost of the high-end shelving EQ was all I needed to get the tenor to sit perfectly for both ensemble and solo lines.

For Married Couple's trombonist Rob Ewing, my scribbled session note read simply, "Perfection." Through a transformerless solid-state Sytek preamp, the trombone sound was solidly etched and exhibited no problems with murkiness or raspy high end.

During the review period, acclaimed English trombonist Gail Brand also visited the studio and put the R-122 through its paces on a variety of improvised pieces with techniques ranging from delicate harmonics to blaring pedal tones. In an array of solo, duo, and overdubbed settings, the Royer always sounded gorgeous, full, and well defined through a Grace 101 solid-state preamp. Brand characterized the Royer R-122 as possessing "true-to-life sound, clear and warm" and was impressed by the way the mic handled forceful playing as well as tiny detailed sounds such as whispers and pops. She also mentioned that she missed a little of the horn's brightness through the R-122, but in her estimation, it wasn't enough of a problem to warrant a mic change. For her live-to-DAT sessions, I thought the mic's top end was very complementary. However, on overdubbed and denser pieces, I often found myself reaching for a bit of high-shelving EQ to compensate for the ribbon mic's close placement.

On other horn-based sessions with the band Dropsy, the R-122 was every bit as satisfying as a vintage RCA 77-DX on baritone sax, and it proved its worth on trombone and trumpet. Again,

Royer's active ribbon delivered full, warm lows and incisive highs on the horn section with a minimum of repositioning or mix EQ.

On an overdubbed bongo track, I felt the mic wasn't delivering enough attack, and so I resorted to a trick that really helps to bring out highs with both the R-121 and R-122. Because the ribbon has less proximity effect at the rear, I simply turned the mic around 180 degrees and then reversed the polarity at the preamp. Magically, with the help of some high-end boost, the drum popped out of the rhythm track.

The R-121 has long been my mic of choice for rock, blues, and jazz guitar, and Dropsy provided a chance to try out the R-122 on electric guitar. The R-122 performed well, though with so much gain that I had to place the mic at a greater distance from the guitar amp than usual to avoid clipping the preamp.

Hot Shot

Since the R-122's output level is roughly equivalent to that of a condenser mic, it can get a bit too hot on some sources. For recording a live blues festival at Moe's Alley in Santa Cruz, California, I positioned the R-122 on a cranked-up harmonica amp that was to be used by a parade of performers throughout the night. I was using a Universal Audio 2-610 tube preamp, and to keep from distorting its input, the mic had to be placed about a foot back from the amp.

Normally, doing that would invite major problems with onstage leakage, as the center-stage drum kit was only about five feet away. But to my amazement, I found that aiming the null side of the Royer's figure-8 pickup pattern at the pounding percussionist—using the mic's distinctive side fins as visual aids—effectively cancelled most of the ambient drum and amp sound. The R-122's ample low end still provided a rich and commanding harmonica tone at that distance, and the mic's rugged build quality allayed any concerns about using a studio ribbon mic in a high-traffic, live-sound situation.

Much to my surprise, the Royer's sharp side rejection also allowed me to record the Tin Hat Trio's violinist, Carla Kihlstedt, in the same room as a full drum kit. As long as the drums remained below rock volume and Carla remained within a foot of the carefully aimed R-122, I got the discrete violin track I needed, and the ensemble got the physical closeness they requested, without baffling.

In that setting, even when the drummer got excited, low-end leakage from the kick and toms was rarely a problem. However, loud off-axis snare and cymbal sounds quickly became boxy and

overwhelming, prompting me to isolate the violin in a booth for recording rock numbers. Kihlstedt was very enthusiastic about the Royer's smooth tone on violin and viola. When I recorded Kihlstedt's lead vocals using the active ribbon mic, her soft, breathy singing voice came across well, too.

Another interesting use for figure-8 pattern mics is on folk singers, who often need to track vocals and acoustic guitar at the same time. Songwriter Jason Miller provided the chance to try the R-122 on his Gibson acoustic. After fiddling with EQ and placement (including turning the mic around 180 degrees to reduce its substantial proximity effect), we got a resonant and clear tone that pleased us both.

The R-122's timbre was perfect for a mellow fingerpicking part, and the mic's extra gain was a major advantage in that situation. Once more, the mic's off-axis rejection was amazing. When the side of the mic was aimed at Miller's mouth, there was hardly any vocal bleed at the guitar mic and none of the phase-shift coloration that often plagues that kind of recording. For a percussive strumming part, the Royer was suitably chunky and not harsh at all, even with a big cut in the low-end EQ to reduce thumps and boominess. For rhythm overdubs and for pop music, I would still prefer the shimmering highs of a small-diaphragm condenser, but the Royer's performance was ear-opening.

I also tried the Royer on clarinets, on flute, and as a room mic on drums with uniformly excellent results. Rock engineer Bart Thurber (who shares my fanaticism for Royers on electric guitar) was knocked out by the R-122's superb tone on a variety of guitar tracks. Thurber confirmed my observation about the mic's superb off-axis rejection and, despite some grappling with its hefty gain, opined that it could become "the new standard for electric-guitar recording." During listening tests, the pair of R-122s proved very closely matched to each other and to my R-121 as well. When positioned side-by-side as ambient drum-room mics, the only difference I could discern between the traditional and active models was a slightly sweeter high-end response on the R-122, contrasted with a bit more upper-midrange bite in the R-121.

Blue-Ribbon Winner

Other than a caveat on the increased potential for preamp overload (which is a new challenge for ribbon-mic users, and certainly not a disadvantage), I found nothing to fault and much to love about Royer's active ribbon transducer. For those of us who have spent years struggling to use ribbon mics on quiet violins, on fingerpicked guitar, or as room microphones, the R-122's active electronics are a godsend.

My only disappointment is that I can't find a satisfactory way to use the new Royer (or any other ribbon mic, for that matter) as an overhead mic for drums. Other engineers rave about using that technique, but so far, and in spite of repeated attempts, it just doesn't work for me in my studio.

The R-122's cost will undoubtedly be hard to swallow for some EM readers, but it's justifiable when you consider that the R-122 doesn't require a high-gain or "ribbon-friendly" preamp. The R-122's high output, low noise, and rugged construction make vintage ribbon mics seem old-fashioned, and they costs about the same. As a reviewer and as a recordist, I am thrilled at what Royer has done to bring the ribbon mic into the 21st century.

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