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Pro Studio: Vocal Mics in the Studio

Fast Forward's Pro Studio guru puts four mics through their paces

By Keith Hatschek



One of the key elements in any popular song is the vocal performance, and an essential part of capturing a vocal performance accurately is the microphone used in the recording. Top recording engineers know how important it is to match each singer's particular vocal qualities and timbre to the microphone that will best capture the power and subtleties of that voice. This month, Fast Forward brought four high-quality vocal microphones (i.e. list price of \$1,000 or more) into the studio and ran each through its paces, recording male and female vocal tracks and some narration. By the end of the session, you'll have a good idea of which of these mics may be worth the investment for your home recording studio and what you might want to look for in studios near you. The four contenders include: the Kiwi, from BLUE Microphones; the TLM 103 from Neumann; the Black Hole BH-2 from JZ Mics; and the KSM 44 from Shure. I invited my colleague Jeff Crawford, a local producer and engineer over to provide a second set of ears for the evaluation. Two singers were asked to help with the testing, each one bringing a backing track of a song that they were familiar with to use for the test session.

Set Up

To accurately judge each mic in relation to the others, we used the exact same signal path for each mic. This included a Mogami Gold mic cable routed alternately into a single Digidesign C 24 mic preamp. Recordings were done at 24-bit, 44.1 sampling rate into Pro Tools HD. For monitors, we used Meyer Sound HD-1s. All recordings were done flat, with no signal processing of any type. Performers stood 10" away from each mic, directly on-axis.

For those mics that offered switchable pads or roll-off filters, all were set to the neutral or "off" position. Each of the four mics came with a shock mount system, which is essential when working with sensitive microphones such as these in the recording studio. With the exception of the BH-2, the mics came with some variation of an elastic suspension frame, sometimes referred to as a "birdcage," to isolate the microphone body from bumps or thumps. The BH-2 came with a spring-loaded mount that provided some isolation, but did not appear to offer the same level of shock mount isolation as the more traditional mounts. The KSM 44 and TLM 103 mounts allowed the mic itself to be threaded onto the mount, providing an added degree of security. All four mics require 48v phantom power for operation, which is provided by most mixing boards and home studio recording interfaces.

Tracking Vocals

To start the proceedings, our female singer, Danielle, stepped up to the mic and began putting the Neumann TLM 103 through its paces. What we noticed immediately was a rich sound that nicely emphasized the upper frequencies, while delivering a solid bottom. Jeff described it as "that classic Neumann sound," which is not surprising as the TLM's capsule is the same one used in its more expensive siblings, the U 67 and U 87. Danielle was singing a classic Motown song, which required her to hit some low notes, while including an outro where she improvised in her upper register. The TLM 103 sounded natural with loads of presence so that every word was clearly audible. Jake, our male vocalist, brought in Queen's "Somebody to Love," which provided a perfect vehicle for his high tenor voice. As he ran up and down the scales singing this classic, the TLM 103 provided a natural sound that was a near-perfect representation of Jake's voice as we had heard it unamplified during his warm up in the studio. Each aspect of Jake's enunciation was picked up nicely throughout the performance by the TLM 103. On one or two of the very loudest notes, we heard a little bit of distortion, which was our mic preamp overloading, so we reduced the trim on the mic preamp and had Jake re-record the song one more time to have a clean take for comparison purposes.



Neumann's TLM 103 in its suspension ready for our first vocalist.

Next, we patched in the JZ Mic BH-2 and immediately heard a difference from the first microphone tested. As Danielle ran through her performance, Jeff and I commented on the presence and clarity that the BH-2 reproduced, while also noting that there was not as much warmth apparent with this microphone. Her voice sounded clear with a little bit of edge, but the mid-range frequencies seemed to be slightly scooped out.

The BH-2 delivered a very smooth sound on Jake's voice. In fact, Jeff commented that this mic seemed to handle the dramatic peaks of his performance even better than the TLM 103. We noticed quite a bit more edge in the sonic character of the BH-2 than the TLM 103, which in this case, provided a nice high end boost that worked well on his voice.



The JZ BH-2 is a unique-looking vocal mic, with a custom spring-loaded shock mount.

Both Shure's KSM 44 and BLUE's Kiwi are multi-pattern microphones, meaning that they can be easily switched between a cardioid, figure-8, and omnidirectional pickup pattern. The first two mics tested were cardioid-only mics. For our tests, both multi-pattern mics were set to cardioid, which is what is most often used for solo voice studio recording.

As we began listening to Danielle perform on the KSM 44, Jeff remarked on the similarity in sound to the TLM 103. The Shure had a rich, full frequency tonal quality, and contrasted quite a bit with the last mic tested, the BH-2. In addition, as we listened more closely to Danielle's performance, it was clear that the Shure provided a boost in the mid-range frequencies that added a husky quality to her voice that really made the low notes full-sounding. The mid-range emphasis that we had heard on Danielle's recording was also there on Jake's. For a tenor voice, this tended to smooth out the overall peaks in his delivery and gave Jake's voice a balanced timbre with noticeably more warmth than either of the previous two mics.



Shure's KSM 44 is a multi-pattern condenser mic.

Finally, we moved on to the BLUE Kiwi, a classic "bottle" type design with the capsule mounted above the microphone's large cylindrical housing. As soon as Danielle began singing into the KIWI, the first characteristic we noticed was that the upper frequencies of her voice had a certain sizzle that wasn't present on any of the other mics tested so far. After recording a complete take, we played back the recorded track and noticed that the KIWI provided a rich, balanced tonal quality from the softer, low notes to the higher range improv licks Danielle added near the end of each take.

With Jake, we noticed this microphone's ability to easily handle the very wide dynamic range of the song with no emphasis on any particular part of his range. Compared to the KSM 44, the KIWI offered a broader overall frequency response (more highs and lows), with that added high-frequency sizzle that we heard on Danielle's performance, giving some nice edge to Jake's track. We both commented that this high-end boost would be very handy in getting a male vocal to cut through a busy or complex backing track.



BLUE's Kiwi, a classic bottle design with the capsule mounted above the microphone's large cylindrical housing.

With our male and female vocals completed, we said goodnight to both singers, and proceeded to record narration using all four microphones. Narration recording allowed us to hear the subtle differences between each mic without any backing music track, providing an even more detailed perspective on each mic's sonic character. While there weren't any variations that deviated greatly from our earlier observations, the KSM 44 came across as having the warmest overall sound for narration, largely due to its enhanced mid-range response, a sort of "FM deejay" tone quality that was very pleasing. The TLM 103's natural tonal quality was again evident, whereas the BH-2 provided a contrast to the TLM 103, sounding a little bit processed or compressed in comparison, which wasn't necessarily a bad thing, as it brought added intelligibility to the narrator's voice. However, the KIWI offered the highest level of definition on the narrator's voice, while the extra high end gave his voice a crispness that helped the mic's performance stand out just a bit more when compared to the others.

The Verdict

At the beginning of the session, Jeff and I agreed we would not take into account the comparative costs of the microphones, instead judging them initially on their sound quality and tonal characteristics. Now that we had gone back and A/B'ed each mic using three sound sources, it was time to discuss the performance/price ratio of each against the others.

Sonically, the KIWI nudged out the other mics in pure performance for voice recording with its overall balanced sound and added sizzle. The KSM 44 provided both Danielle's and Jake's voice with a warmth that added a little more body to the sound source, and as such, would be a great choice when a little more richness would fatten up a particular voice. The TLM 103 was the most natural-sounding of all the mics tested, delivering that classic Neumann sound, a sonic signature that has stood the test of time for decades. Finally, the BH-2 contrasted with the other mics, delivering a sonic quality that was very pleasing on the tenor vocals, while boosting intelligibility of our narrator's voice through what both Jeff and I discerned as a slightly compressed sound with an emphasis on the high frequencies. However, it didn't seem to fit with Danielle's voice, coming across as a bit too thin-sounding.

Before we declare any winners, let's look at the street prices for these four excellent condenser microphones and discuss their performance/price ratio.

Microphone	List & Street Prices
Shure KSM 44 multi-pattern condenser	\$1,340 / \$799
Neumann TLM 103 cardioid condenser	\$1,478 / \$999
JZ Mic BH-2 cardioid condenser	\$1,895 / \$1,599
BLUE Kiwi multi-pattern condenser	\$2,399 / \$1,999



As might be expected in this price range, each mic comes with a sturdy, well-designed case to protect each mic. From from the upper left corner (clockwise) TLM 103, KSM 44, Kiwi, and BH-2.

Taking the relative cost of the microphones tested, adding the Kiwi to your home studio would require a significantly greater cash outlay than some of the other test mics, but for really top-of-the-line sonic performance, it's a worthwhile investment for someone serious about making master-quality recordings. We only touched on the possibilities the Kiwi offers to fine tune its tonal and pickup response, as it offers continuously variable patterns via the nine-position pickup pattern switch on the back of the mic's body. Meanwhile, the BH-2, at roughly 20% less cost than the Kiwi, is certainly worth considering, although in our tests it didn't offer anywhere near the richness or flexibility of the Kiwi. However, it did provide a unique, slightly edgy sound that nicely enhanced Jake's tenor vocals and our narrator's intelligibility.

This brings us to the TLM 103 and the KSM 44, both of which have current street prices below \$1,000. With respect to performance/price ratio, they are exceptional. The KSM delivered a warm, rich sound, that will add depth to a singer's voice while its balanced response (it had plenty of nice highs) make it a flexible choice, well-suited for many different voices and styles of singing. Meanwhile, the TLM 103 delivers richness, presence, and that instantly recognizable Neumann sound at a price that is hard to beat. If you are looking for the sound you've heard on hundreds of hit records that have featured Neumann vocal mics, the TLM 103 is the perfect choice.

The bottom line: adding a top-quality vocal mic to your home recording system can greatly enhance your ability to perfectly capture the nuance and power of your vocal performances. Whether you opt for one of the vocal mics under \$1,000 or go for a more expensive mic, it makes sense to visit a well-equipped local recording equipment dealer and demo a variety of vocal microphones. If you're a regular customer, many dealers may be willing to come out to your home studio on a night or weekend with two or three of the best mics in your price range so you can test them yourself in the environment where you will be using them. Take your time to research and select the best vocal mic for your needs. If you do, you'll find that the tracks you'll be recording will be a more accurate representation of just what kind of vocal magic you are capable of creating.

Special thanks to the representatives of BLUE, JZ Mics, Neumann, and Shure who provided the evaluation models for our test sessions.

Story Links

[BLUE Kiwi Owner's Manual](#)

[JZ Mic BH-2 \(aka the SE\)](#)

[Shure KSM 44](#)

[Neumann TLM 103](#)

[Understanding Microphone pickup patterns \(This is an excerpt from a helpful microphone primer found on pro audio dealer Sweetwater's web site.\)](#)



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