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MICROTECH GEFELL UMT70S AND UM92.1S

German engineering results in two high-class microphones
By Mitch Gallagher

German manufacturer Microtech Gefell has been in the business of making microphones for 75 years. The company continues to craft microphones the old-fashioned way, by hand, using many of the methods developed by Georg Neumann dating to when he founded the company in 1928.

Microtech Gefell makes microphones in three main categories: large diaphragm condensers, small diaphragm condensers, and measurement mics, as well as small-diaphragm models featuring pure nickel diaphragms. The microphones we're looking at here are large-diaphragm models that trace their lineage straight back to the earliest vintage microphones created by Georg Neumann. In fact, both mics utilize the venerable M7 capsule, designed by Neumann in 1932 (see sidebar "Time Capsule" for more information on the history of Microtech Gefell and the M7 capsule).

As mentioned above, both the mics reviewed here are large-diaphragm condensers. But that's pretty much where the similarities end. The UM92.1S is a multi-pattern tube design that uses transformer coupling on its output. It traces its ancestry back to the original Neumann-Gefell UM57. The UMT70S is a multi-pattern FET solid-state design and has a transformer-less output.

I was quite enamored of the stereo pair of Microtech-Gefell M930 mics I reviewed in the June 2003 issue — so much so that I ended up buying them for my studio. Let's see if these two mics hold up my high opinion of the brand.

UM92.1S

The UM92.1S is a big, solid-feeling mic. It features an external power supply, which connects to the mic using a hefty 7-pin cable. For secure connection, the cable screws onto both the mic and the power supply. Nice. The mic also screws into the EA92 shock mount, allowing you to hang it upside down with no fear of it falling to a horrendous death on the floor below.

On the UMT70S, you turn the ring beneath the head grille to select omni, cardioid, or figure-8 polar patterns. (On the UM92.1S, pattern selection is handled via a switch on the external power supply.)



Aside from the polar pattern selector switch located on the power supply, the UM92.1S has no switches, filters, or pads. The pattern selector switch gives you a choice of using omnidirectional, cardioid, or figure-8 patterns. The frequency response curve of the mic varies a bit depending on the polar pattern; for example, in omni pattern, the mic is ruler-flat from 50 Hz to around 3,000 Hz. Above this point, there are small peaks at 5,000, 10,000 and 15,000 Hz, with a fall-off to 20,000 Hz. In cardioid and figure-8 modes, the low-end gently rolls off starting at 500 Hz, although proximity effect can provide plenty of low end when necessary. Both cardioid and figure-8 modes have broad peaks in the high-end "presence" (around 7k) frequency range.

So what does this mean sound-wise? In general, the UM92.1S has a fat, round tone, with a lot of midrange complexity and solid, full low end. There's plenty of presence, but without any associated harshness. The top end is smooth, but well detailed.

On vocals, tracks recorded with the UM92.1S sit well in the mix. They're full, without being mushy or boomy. There's plenty of definition, making the vocal intelligible, but sibilance is not a problem. This is a mic that could be used to fatten up a thin voice, or to add punch to a weaker one.

On classical guitar, placement was critical, since the fat low end and midrange can result in an overly obese sound. The mic's presence peak helps with detail, although it can over-accentuate string squeaks if placement is poor.

I was quite pleased with the UM92.1S on steel-string guitar, particularly for heavy strumming parts, where a lot of punch and drive was desired. It also worked well for capturing the elusive low end that can result from deep

Microtech Gefell UMT70S and UM92.1S

UM92.1S

Type: Large diaphragm tube condenser microphone
Price: \$3,250
Contact: Microtech Gefell, www.gefell-mics.com

Polar Patterns: Omni, cardioid, figure-8
Frequency Response: 40 Hz to 18 kHz
Maximum SPL: 120 dB

UMT70S

Type: Transformer-less large-diaphragm FET condenser microphone
Price: \$1,600
Contact: Microtech Gefell, www.gefell-mics.com

Polar Patterns: Omni, cardioid, figure-8
Frequency Response: 40 Hz to 18 kHz
Maximum SPL: 139 dB (149 dB with pad on)

The UM92.1S has a fat, round tone, with a lot of midrange complexity and solid, full low end.

detuning of the guitar's bass strings — some mics have trouble capturing the “real” low end, substituting amorphous boom and bass wash instead. Good top end detail complemented this low end, with rich midrange colors filling out the middle.

I was also quite happy with the UM92.1S on crunchy electric guitar. All the thump of a 4x12 Marshall cabinet was right there, without too much tizz or hash in the distortion on top. Singing solo tones were captured accurately, as was the cluck and twang of a clean chicken-picked Telecaster track.

On handheld percussion, the UM92.1S delivered pure crystalline tones from metal instruments such as triangle and finger cymbal. There was also plenty of attack in transient-heavy parts such as clave.

All in all, the UM92.1S excels at any application where you'd normally use a large-diaphragm tube mic — I wouldn't hesitate to use it on just about anything in the studio.

UMT70S

The UMT70S is different from the UM92.1S in almost every way — beginning with its physical appearance. It's a large-diaphragm condenser, featuring transformer-less FET solid-state electronics. The mic is capable of three polar patterns, omnidirectional, cardioid, and figure-8. It operates off 48-volt phantom power. To select among the polar patterns, you turn the ring (or collar) beneath the head grille. Two switches are located on the long, thin body of the mic, one activating a 10 dB bass roll-off starting at 90 Hz, the other padding the electronics by 10 dB. Some mics use one switch for these two functions, forcing you to choose one or the other. With the UMT70S, the switches are independent, so you can activate both the roll-off and the pad at the same time if desired.

Looking at the frequency response graphs for the UMT70S reveals curves for the three polar patterns that are remarkably similar to those for the three patterns on the UM92.1S. There's the same flat-as-a-board low end and multiple high-frequency peaks in omni mode, and gentle bass roll-off and broad presence peak in cardioid and figure-8 modes.

The UMT70S is the kind of mic that you can just put up and expect to sound good.

Sonically, however, you would never mistake the UMT70S for the UM92.1S — which goes to show that specs and graphs

only take you so far in learning about a mic (or other piece of audio gear). There's substantial difference in the low end, with the UMT70S offering a tight, contained bottom. On the top, the UMT70S has more sparkle and shimmer, without sounding crispy or sterile. In the mids, the UMT70S has clarity where the UM92.1S has complexity.

I found the UMT70S to work on virtually everything I put it in front of. It's also more forgiving of placement than some other mics. On a Marshall 4x12, I simply stuck the mic in front of the cabinet and pushed up the gain, doing a normal sound check before tweaking the final mic placement. To my surprise, the sound was excellent; full, round, and crunchy, with good definition. Thinking I might have gotten lucky, I moved the mic around and was rewarded with equally good tones.

On classical and steel-string guitar, this mic can handle getting in closer than some other large diaphragm models — certainly you can get too close and experience the dreaded soundhole “boom,” but with reasonable care, I was able to get in close for a nice intimate sound with plenty of detail. On 12-string guitar, the UMT70S was sparkly, and captured all the drive of hard-strummed parts. I had similar good luck recording hand percussion, something I normally reserve for small-diaphragm mics. The transient attacks were there, with good high-end detail, no harshness, and plenty of fullness.

After experiencing such good results on instrument applications, I turned to vocals, and was likewise impressed. The UMT70S is the kind of mic that you can just put up and expect to sound good. It's a full-sounding vocal mic, with plenty of dynamics, good detail without overly much sibilance, and a solid low-end capable of capturing hard-sung male vocals.

CONCLUSIONS

Both the UM92.1S and UMT70S impressed me with their performance. I was especially pleased with their versatility. These aren't mics that you're going to pull out for one isolated application. They're not cheap in this day and age of pretty-good sounding \$99 mics, but their handcrafted quality and sonic excellence justify the asking price.

If I could only have one, which would I choose? Tough question, as having both would be ideal. Still, if limited, I would have to consider what I was after. The UM92.1S has a more colored, tube tone (desperately trying to avoid the “warm” and “fat” clichés here). The UMT70S is less colored, tighter, and more open. I'd probably be inclined to go with the latter, as it offers a more neutral palette, then supplement that later with the more colored tube model. But do yourself a favor: Avoid making the choice and get both!

UM92.1S

Strengths:

- Fat tube sound
- Detailed top end
- Shock mount and cable attach securely

Limitations:

- Pricey

UMT70S

Strengths:

- Versatile
- Independent lowcut filter and pad switching
- Compact size allows easy positioning
- Tight bottom end

Limitations:

- No mic clip or shock mount included

Few would deny that the heart of any microphone is its capsule — the entire process of converting sound waves into electrical current begins right there. The Gefell M7 capsule, as used in the UM92.1S and UMT70S microphones on review here, has a particularly long and storied history.

The M7 was designed in 1932 by Georg Neumann. Neumann founded his microphone company in 1928 in Berlin. The advent of the Second World War caused relocation of the company to the quiet village of Gefell. After the war, some members of the company returned to Berlin; this branch of the company became the Neumann company in 1948. Neumann Berlin and Neumann Gefell worked together closely until 1961, when the Berlin Wall placed the Gefell company in East Germany. In 1964 communication with the West was banned by the East German government.



The Gefell company continued developing microphones and tube technology, re-entering the Western market when the Berlin Wall fell in 1989. In 1993, ownership of the company was returned to the Neumann family; it's now run by the directors of Microtech Gefell under the official name "Georg Neumann KG." (There is no relation between this company, and the Neumann brand name, which was purchased by Sennheiser in 1990.)

The Gefell M7 capsule uses a dual-membrane capsule with a triangulated pedestal mount. This triangulated mount helps to reduce reflections coming off the microphone body and capsule housing, which in turn reduces phase cancellation and comb filtering anomalies. The substrate or base material in the M7 capsule is made from PVC (Poly-Vinyl-Chloride) — in fact, it's the only capsule currently manufactured that uses PVC. Other similar capsules use PE (Poly-Ethylene), more commonly known by the name "Mylar." The substrate is a thin sheet that's coated with a gold surface, becoming a "metal film," and charged to create a capacitive (condenser) effect.

PVC starts as a liquid that's spread across a glass surface to become a thin film. PE, on the other hand, starts as a solid that's rolled into a thin sheet form. Because of this, PVC is more difficult to make and has a tougher time meeting quality control standards. The PVC used to make the M7 capsule is manufactured in the Gefell factory, using the same process originally designed by Georg Neumann. Modern manufacturing technology has been applied to the process, resulting in higher levels of purity, better consistency, and longer life expectancy.

While one could argue the benefits of PVC versus PE (and vice-versa), what it really comes down to is that PVC has different characteristics than PE. According to Gefell, PVC is "fluid" and therefore attains its final form naturally. The membrane is more evenly tensioned, reducing physical distortion. The company says this results in a more uniform transfer of energy, making the diaphragm more "forgiving."

The M7's PVC diaphragm has a 10-micron thickness — a seemingly huge thickness considering the prevalence of modern designs featuring diaphragms as thin as two microns. However, the company credits this thickness (and the resulting stiffness) as contributing to the M7's distinctive sonic character. They also point toward side benefits such as reduced sensitivity to vocal pops and humidity deposits.

The M7 capsule has a long history; it has been used in some of what we consider to be the "classic" vintage microphones, including the Neumann-Gefell UM57. In addition, early Neumann U47, U48, and M49 microphones used M7 capsules. Later, this was changed with the U47 using the K47, the U48 first using the K47 then the K49, and the M49 using the K49.

For the past 75 years, many Microtech Gefell microphones have used (and continue to use) the M7 capsule, including current models such as the UM92.1S, UMT70S, UM900, and UMT800. These and other Microtech Gefell microphones are still completely hand-made in Gefell, Germany. For further reading on the fascinating journey of this company from its founding to the years in the Eastern Bloc to the modern revival in the West, visit www.gefell-mics.com.

—Mitch Gallagher

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