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# TRACKING GUITARS

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## New Products On Test:

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# REVIEW

BY PAUL VNUK JR.

Peluso Microphone Lab is based in Willis, VA, and has been crafting microphones since 2002. While this is Peluso's first appearance in the pages of *Recording*, the Peluso name is well known in the industry for recreations of classic microphones of the past. John Peluso's capsules are also used in OEM designs by other mic manufacturers and favored by many in the DIY mic mod crowd.

This month we look at Peluso's newest model, the solid-state large-diaphragm P-87, a take on the classic U 87 from Neumann. I use the word "classic" on purpose, as the P-87 is based on the classic 1970's U 87 rather than the later U 87 A or U 87 Ai variants.

## Build

The P-87 is a hybrid design which makes use of globally-sourced parts married with USA-built circuit boards, John's capsules, and more, all of which is assembled in the Peluso family's Virginia facility. All mics in the Peluso line share a brushed nickel look with a large etched Peluso logo. Aside from general cosmetics and switch implementation, each model's body/head basket follows the look and design of the original whenever possible. The P-87 is very similar overall to the U 87, but at 8" by 2" it's ever so slightly shorter and slimmer.

The P-87 uses a 4-wire center-terminated dual-diaphragm K87-style capsule that, like the original, is 34mm in diameter. The P-87 is equipped with a custom output transformer and a modern FET circuit.



## Peluso Microphone Lab

### P-87 Solid State Condenser Microphone

A modern vision of a classic solid-state mic offers exceptional value

Some relevant specs: frequency response of 20 Hz to 20 kHz (the original U 87's was 20 Hz to 16 kHz); sensitivity 10 mV/Pa; impedance 200Ω; maximum SPL 152 dB w/pad; and equivalent noise 14 dBA.

The P-87 offers three switchable polar patterns—cardioid, omni, and bidirectional (figure-8). It also has switches for a 10 dB pad and a low-frequency rolloff. It comes in a kit with a felt bag, a foam windscreen, a threaded hard mount and a threaded elastic shock mount, all in a compact flight case.

## Sound

The P-87 is a clean and honest mic that is even and balanced from the lows to the highs with only a slight upper mid bump. It lives in the same sonic ballpark as mics like the Brauner Phantom Classic, Milab DC-96B, and even the new Roswell Pro Audio Aurora. Overall the Roswell and Brauner are a touch more open and modern, with the Brauner being the most clinical and unforgiving of the bunch. For comparison, the P-87 was closest in style and weight to the slightly more colored Milab DC-96B, also a transformer-equipped 1960s mic design.

Cardioid mode is my favorite of the three polar choices. It is smooth, offers nice off-axis rejection, and the filter works well to lessen proximity effect without thinning out the mic's sound too



much. When engaged, the filter controls plosives exceptionally well, making this a great mic for voiceovers and close-up vocal work.

Figure-8/bidirectional mode is the thickest sounding of the group, with a very tight off-axis rejection and great nulls for use in a Blumlein array, Mid/Side applications, or just to reject a vocalist/guitarist's voice while miking an acoustic guitar.

About the only application where I wouldn't reach for the P-87 would be low-end sources like kick drum, bass cabinet, or upright bass, where I do prefer darker-toned mics like the Neumann U 47 fet.

#### **P-87 vs. U 87**

Thanks to producer Gary Tanin and Ric Probst of Planet Green Productions, I was able to get my hands on a well maintained 1970s (battery compartment)



Omni thins out and opens up the sound. Note that there is a slight 5% drop in lows as you move off axis in omni mode, but for most applications this will be minimal. I should also note that the P-87 exhibits a tight solid ping as you tap the body, but this resonance wasn't obtrusive in listening tests.

#### **In use**

The P-87 works great in any situation where you would normally put a U 87 to work... which, if you're new to the U 87, means that it works great in any situation, period. It is flexible and forgiving on most sources.

On vocals it offers a tight and immediate sound. It is a great and versatile drum mic, whether used on toms, mono front of kit, or overheads. It's well suited to acoustic guitar, percussion, and winds. It is one of the few large diaphragm mics I would reach for on electric guitar cabinet, with or without a dynamic mic like a Shure SM57 or Audix i5. I especially like it on its own as a room/distance mic on electric guitar cab.

U 87 for some side-by-side tests of vocals, acoustic guitar, and percussion. We spent the afternoon at Gary's Milwaukee studio Daystorm Music ([garytanin.com](http://garytanin.com)), listening and comparing the two mics. While we found them to be definitely cut from the same sonic cloth, there were a few notable differences.

The P-87 was significantly louder and cleaner with a lower self-noise. Both mics had a similar low end and mid tone, but the P-87 was slightly more open on the top end. Gary's word was that the vintage U 87 had a "gauzier" sound that added a nice sheen and produced weight in vocal takes. I preferred the P-87's clarity when it came to acoustic guitar as it added a gentle definition to the strings.

Keep in mind that we were comparing a 40-year-old mic to a shiny new one, and the P-87 still had the "87 sound." In separate conversations, both Gary and John Peluso reminded me that "back in the day," studios would buy six brand-new U 87s, label them 1-6, and designate them all for different tasks, since each one might sound a tad different from the others, even when new!





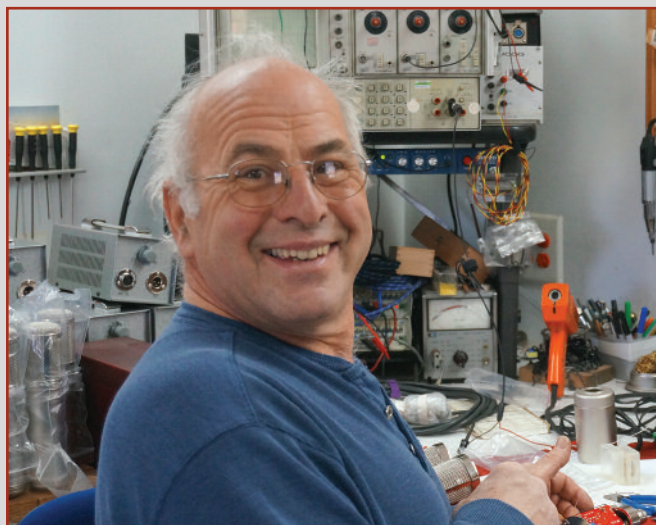
At just under \$1000 street, the Peluso P-87 is quite a value, offering a very broad range of uses and serious bang for your buck... especially if you're eager for the balanced classic/modern U 87 sound!

**Price:** \$994

**More from:** Peluso Microphone Lab,  
[www.pelusomicrophonelab.com](http://www.pelusomicrophonelab.com)



## From Studio To Workbench: An Interview With John Peluso



### Can you give us a bit of your background?

*John Peluso:* I grew up through the big studios. I worked at Pilot Productions, a movie studio a mile from my house as I was growing up, starting at an early age... 10 or so. Then I worked in several small studios, Ladies and Cash Records. I then worked for Verner Ruvalds at Chicago Stereo Mastering, then moved to the Chief Engineer position at Sonart/db, Streeterville Studios, Paragon Studios, and Remington Road Studios.

Verner had been [Georg] Neumann's assistant during the World War II era, and then he came to the United States to work at Shure Brothers as part of the import of knowledge and technology from Germany after the war. He would sit and talk all night long about microphones if anyone would listen... and I knew the knowledge was valuable, so I'd stay and listen. He gave me original notebooks and design notes from Neumann—original 47s and stuff.

### How did Peluso Microphone Labs come about, then?

Nineteen years ago we moved from the Chicago area to south west Virginia. I had been doing some design for a couple of other companies, so it seemed only logical that we would start our own mic line. We're totally a family operation: myself, my wife Mary, and my stepson Chris are the principals in the company. Chris will be taking it on when we get ready to retire in 15 or 20 years.

### And was the first mic you started with the 22 47? (a U 47-style mic).

It was the 22 47, the short one, yeah. Then it grew into the CEMC6 and the 22 251 came shortly after that.

### Is the 22 47 still the most popular Peluso mic? Or would that be the 22 47 LE?

The 22 47 SE is, actually. That's the one I almost always recommend. The SE uses a steel tube very similar to the one that the Russians still use in their submarine sonar, so it's very quiet.

### How and where are Peluso mics made?

We get the metalwork, the flight cases, the wood boxes, and the shock-mounts made in Asia. Then we do all the critical work here. We build all the circuit boards, we do all the final capsule assembly.

### Do all the mics use the same capsule, or do you vary the capsule depending on historic accuracy?

They're all different. The 22 251 uses a CK12 style capsule, the P-49 uses a K49 style capsule, the P-67 uses a K67. Our 47s use our own version of a 47 capsule, but it's built completely differently than the Neumann M7 or the K47.

### What about the new P-87? Which capsule does it use?

The P-87 uses the original K87 style capsule with independent backplates. It's incredibly close to the K87 they made in the 70s.

### Like a U 87/U 67, does it have the exact same body and head basket as your P-67?

There are a couple of little differences, like how the head basket mounts because of the switches, but the body and head basket design are the same.

### What can you tell me about the P-87's circuit design?

Circuitwise it follows the original 1970s 87 circuit—without the battery compartment, obviously. We used really high grade components, WIMA caps, and low-noise metal film resistors throughout.

### And what about the transformers?

The transformers are custom-made in Japan for us, to our specs. We strive to get transformers that have the same frequency and distortion characteristics as the original mics had. It's a chore to do these days, because all the transformer companies say, "Oh, we don't want to make a transformer that bad, we make better transformers now."

Older transformers used less nickel, which meant there was a bit more low-frequency distortion, and that adds a sort of a meaty texture to the low end. When you use a really nice modern transformer with higher nickel content, that distortion isn't there. It's clean and crisp-sounding, but doesn't have the sound of the original.

### It is interesting to me that with the proliferation of U 47, ELA M 251, and C 12 copies, I can think of only a few companies taking on the U 87.

The original style 4-wire capsule is hard to make. It tends to want to short out between the backplates if you're not careful. All the machining has to be absolutely perfect.

### What was the biggest challenge in designing the P-87, and what was your biggest "aha!" moment?

The "aha moment" came when we found that by using really high-impedance circuit boards, we were able to get a little bit higher output without making any compromises to the circuit.

The challenge was to get the noise floor to modern digital levels without changing the circuit, or putting extra voltage on the capsule, and without changing how the pattern switching works, which is a difference between an original 87 and a modern one. Since the modern one has higher voltages available, they do it as a tube mic did—by changing the voltage on the back of the diaphragm to change the patterns, whereas on the original 87 you'd swap the front plates and the back plates to change the polarity on the back of the diaphragm.

There is a company that makes super-low-noise FETs which are compatible with the circuit, so once we started using those, we achieved a 6 dB quieter noise floor than the original 87, and about 2 dB higher output, without going the way that Neumann did on the 87 A. They increased the polarization on the capsule, which lowers the overload point of the microphone.

### Anything else we should know about the Peluso P-87?

They're very accurate! They're laser trimmed to within a couple of hundredths of a percent, so that every P-87 we've made so far has been a stereo match to any other.

### It seems you've tackled most of the classic fare. What's next?

We're in the process of designing a new stereo mic that has various features that our now-discontinued P-Stereo didn't have, like 180° swivel on the head basket. And we'll probably make a solid-state and a tube mic version. And we're looking at a couple of other places to go... ➔

