

## Computing's silent revolution

By David Becker

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**It wasn't until Mike Chin added a third PC to his home office a few years ago that he realized all those whirling fans, clicking hard drives and humming power supplies were adding up to one big racket.**

"It drove me crazy," says Chin, a freelance technical writer in Vancouver. "It was a state-of-the-art machine, and it was so noisy I couldn't keep it on. Everything made such a racket, I just couldn't work in that environment."

Chin's frustration drove him on a months-long quest to isolate noise-making components and replace them with quieter alternatives, a mission numerous PC users and a growing number of manufacturers have followed in the years since.

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### What's new:

PC noise is raising a ruckus as more powerful computers require stronger and often louder cooling systems and PCs begin to move from the office into living rooms and bedrooms.

### Bottom line:

The quest for quiet computing has inspired a cottage industry of specialist manufacturers, growing attention from major PC makers and a small underground of acoustic cultists. Will average consumers pay more to dim the decibels?



Once a minor annoyance, noise from PCs has become a growing concern as ever-more powerful computers require stronger and often noisier cooling systems--especially with PCs moving out of the office into living rooms and bedrooms. The quest for quiet computing has inspired a cottage industry of specialist manufacturers, growing attention from major PC companies and a small underground of acoustic cultists who'll go to any extreme to eliminate another decibel of PC din.

"People are writing in all the time saying, 'It sounds like a jet engine taking off when I run my PC--what can I do about it?'" said Chin, who started [Silent PC Review](#) to share what he learned building a quiet PC. The site has become one of the leading resources for PC owners looking to muffle their rickety rigs.

"In most cases, it's just bad, inconsiderate design," Chin said. "You see some companies really paying attention and trying to do better, but acoustics still doesn't get much attention."

Most PC noise issues come down to [heat](#). As processors and other components have become more powerful and [electricity-hungry](#), they've required bigger and faster fans to keep them from burning to a crisp. Graphics chip giant Nvidia may have pushed the trend to its extreme about two years ago with the GeForce FX 5800, a chip that ran so hot it required an elaborate fan and duct system so noisy early models are still commonly referred to as "Nvidia leaf blowers" by PC buffs.

Complaints about the Nvidia fans and other extreme noisemakers have prompted manufacturers to make some concessions to acoustics. But truly quiet computing is still largely a niche market, served by specialty manufacturers such as South Korea's Zalman Tech, which makes huge copper heatsinks, water-cooling pumps and other components that dramatically reduce the airflow needed to cool PC chips.

Early adopters have included tech-savvy musicians and sound engineers, who can't afford to have a humming PC drown out the subtle aspects of the music they're making, said Michael Farnsworth, president of [Quiet PC North America](#), the U.S. branch of a British company and one of the first specialty retailers devoted to quiet computing



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equipment.

Lawyers have also turned out to be a good market, Farnsworth said. "Noise reduces your attention and ability to think," he said. "When your time is worth \$300 an hour, that's a big deal."

Interest in quiet computing has varied by region as well as occupation. Robert Jung, general manager of technology and business development for Zalman USA, said it's no accident the company that started the quiet-computing movement was launched in South Korea.

"In Asia, most people live in apartments that are small, concrete rooms," Jung said. "The sound doesn't dissipate very well, so you really notice anything noisy."

Zalman Tech founder Sang-Cheol Lee started the company to sell variations on the super-efficient heatsinks he developed to make his PC tolerably quiet. Zalman has gone on to provide quiet cooling systems for numerous other PC heat-spewers and is now looking at items such as plasma TVs and projectors. "Anything you can think of that creates heat, we're trying to provide a quiet, fanless solution for it," Jung said.

While most quiet-computing buffs start out with such practical goals, a small subset goes extreme, launching search-and-destroy missions for anything that clicks or wheezes in their PC. Forums on sites such as Chin's are full of impassioned debates about whether ceiling tiles or acoustic foam dampen more sound when glued into a PC case or the relative benefits of distilled water vs. diluted antifreeze for liquid cooling.

"For most people, the goal is just to get the PC down to the level of ambient noise in the room where they're using it," Chin said. "But some people have turned it into a hobby, where they obsess over every fine detail. It just becomes a game for them--you take care of one thing, and then you can hear the next most annoying thing."

The extremest of the extreme experiment with "underclocking" and "undervolting," the polar opposite of techniques PC hot-rodders use to push chips [past their normal speed limits](#).

Chin says "undervolting"--adjusting a PC's setting so the processor receives less power than it's supposed to--actually makes sense in a lot of cases where a PC isn't being pushed to its limits. "If you're playing games on the PC, then maybe you want every last little drop of performance," he said. "But for your average user, an incremental drop in performance just doesn't matter. And the payback is that the processor runs a lot cooler."

### Hearing the quiet message

While total silence is still a goal largely reserved for enthusiasts, mainstream consumers are starting to hear the quiet message as PCs perform new tasks such as home media servers, a role that often puts them into environments where noise is more obvious than an office. Just try enjoying the pianissimo of a Chopin nocturne with three case fans whirring in the background.

"We found a lot of our early customers were building custom computers for their home entertainment systems," Farnsworth said. "It can ruin the movie experience when the main thing you hear during a quiet scene is a fan running."

Media applications are the main market for specialty PC makers such as [Hush Technologies](#) in Germany, which makes high-powered, silent PCs that use clever ventilation instead of noisy fans to run cool.

"The concept of a silent, good-looking PC to go into the living room drives the majority of what we do," said John Booth, managing director of Hush.

### The cost of silence

Booth said people instinctively like the idea of having a PC that doesn't make a racket, but selling silence as a premium product feature is still a marketing challenge.

"I think generally...people like the idea of a silent PC," he said. "That's not a problem. The problem is when they have to pay for it." Quiet PCs can cost up to \$500 more than their noisier counterparts.

Hush's approach is to give equal attention to other aesthetic concerns, particular visual appearance. "We conspicuously make our boxes look very attractive...as part of positioning this as a premium product," Booth said.

That may work in specialty markets, but not with mainstream consumers, said Nathan Brookwood, an analyst for researcher Insight64. That's why major PC companies have made only incremental concessions to acoustics, he said.

"Any of those (fanless computing) approaches tend to add cost compared with the more straightforward cooling methods," he said. "PC buyers historically have shown a real aversion to paying for things that don't contribute directly to performance."

Instead, major PC companies are adopting techniques that shave off a few decibels of fan noise without requiring expensive redesign.

Examples include [Cool'N'Quiet](#) technology Advanced Micro Devices adapted from its notebook chips. Cool'N'Quiet instructions baked into AMD's desktop processors throttle down chip power when the processor is idle or executing simple tasks. As a result, the processor runs cooler and requires less fan speed, said Jonathan Seckler, senior product manager for AMD.

"The goal is we would be able to reduce the noise as much as 10 or 15 percent and reduce the actual power usage as much as 60 percent," he said. "In a lot of cases, that means you're reducing the decibel rating to below 25 db," the same level as rustling leaves or someone whispering and close to the level of ambient noise in a quiet home.

The shift toward quiet is something of a turnaround for AMD, which helped spark the move to noisy, high-speed cooling fans in 1999 with the original heat-spewing Athlon chips. Seckler said the market has changed since then to put a value on aesthetic concerns such as sound.

"You no longer have this race where it's power and performance at all costs," he said. "We've seen there is a price you pay for performance. At the end of the day, noise and heat do matter."

That's a message underdog chipmaker Via Technologies has been pushing for years. Most of the Taiwan company's PC processors and [motherboards](#) are low-power models designed to run without a cooling fan, an advantage that has helped Via chips find their way into an increasing number of media-centric PCs. Werner du Plessis, project manager for processor platforms at Via, said it's about time the PC industry looked at issues beyond processor speed.

"Our message has always been cool and quiet processing," he said. "We've never participated in the megahertz race, and finally people are waking up (to the fact) that we had it right from the beginning."

Via is well-positioned to grab a major chunk of the market for media PCs, du Plessis said, because it's easier to build a quiet system around a chip designed for fanless cooling than to retrofit mainstream chips.

"Having a processor designed to run cool and quiet...is something you have to aim for," he said. "It doesn't happen naturally."

Which is why Via and other quiet-computing proponents don't expect the mainstream PC industry to adopt a "silence is golden" ethos anytime soon.

Hush Technologies' Booth said consumers who want a truly quiet PC will have to continue to seek out specialists.

"Everything we've seen so far and into the foreseeable future," he said, "is that the mainstream PC companies are going in the opposite direction from us."

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