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PAGE ONE**Sounds of Silencers Are Loud and Clear: PCs Are Too Noisy****Hobbyists Hear a Whisper And Improvise a Damper; A Computer Oil Bath**

By CHARLES FORELLE
Staff Reporter of THE WALL STREET JOURNAL
June 2, 2005

Carl Bohne has a half-dozen computers in his St. Louis home, in various stages of disassembly. He's hard at work putting together a shrunk-down machine the size of a toaster.

Mr. Bohne isn't trying to soup up computers for added power. He wants to quiet them down. Bothered by a noisy PC a few years ago, he took it apart to figure out what was causing the clamor.

Now, building quiet machines is his chief hobby. His computers are packed with foam insulation, noise-damping filters and custom-sculpted hunks of copper that divert heat from the microcircuitry so the built-in fans won't have to work so hard.

Long an afterthought in the performance-obsessed world of technology, computer hum is topic A for a growing "quiet computing" movement. Although the noise from a standard desktop registers only about 30 to 35 decibels -- roughly the level of a whisper -- for some, it is a cacophony that must be muffled.

"When I go visit other people, it drives me nuts," says Isaac Kuo, a computer programmer in Baton Rouge, La. "I can always tell where the computer is unless it is turned off." But he keeps it to himself. "I've long since discovered not to even bring it up with any friends, because they just don't care," he says.

[Isaac Kuo]

Tomas Risberg, a Stockholm neurologist, calls computer noise "a freedom issue." Why "should I have to listen to something I don't want to listen to?" demands Dr. Risberg, who helped persuade the Swedish government to adopt computer-noise standards.

Quiet computing isn't just being practiced on the fringes. More mainstream manufacturers are seeing value in quieter PCs. Some of [Lenovo Group](#) Ltd.'s new IBM-brand desktops have a cooling system engineered to reduce noise. [Apple Computer](#) Inc. markets its new Mac mini as "whisper-quiet." [Dell](#) Inc. maintains several acoustics labs with echo-free test chambers, in part to ensure that its machines

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meet the various noise guidelines employed in Sweden and around Europe.

Designers say noise is becoming more of an issue as PCs rev up and push their way into the living room to play digital music, video and games. A computer's mechanical parts -- including cooling fans and spinning disk-drives -- generally work harder as a PC takes on more tasks. And noise barely noticed amid the buzz of the workplace can be less welcome at home.

The sounds the silencers are trying to vanquish can be very small. A fast, loud gaming PC can hit some 55 decibels, measured from three feet away -- about equivalent to the background noise in a mall. Nirvana for silencers generally comes below 20 decibels, which is a sound all but inaudible, even close by.

Mr. Bohne, who makes his living as an auto mechanic, ekes out the most cooling from the fewest fans by cramming the insides of his PCs with a carefully engineered system of ducts that direct cool air to hot spots. He uses whatever is handy -- a plastic cookie jar, a clothes-dryer exhaust hose -- and picks up bits and pieces at the hardware store.

Serious silencers post pictures and swap tips on sites such as SilentPCReview.com. One popular tweak described on the site: suspending disk drives on a hammock made of elastic bands to reduce vibrations transferred to the computer's shell.

For insulation, silencers buy up sheets of Sorbothane, an elastic polyurethane valued for its damping properties that is used in the insoles of sneakers and in shotgun recoil pads. They also turn to a cottage industry of online retailers selling special, quieting parts, including flower-shaped copper "heatsinks" (about \$45) that draw heat away from a chip more efficiently than the aluminum that comes standard in many PCs.

SilentPCReview.com founder Mike Chin, a music lover who plays piano and guitar, has set up a studio in a converted kitchen of his Vancouver, British Columbia, home. Equipped with a digital microphone and a sensitive sound meter, he records computers and parts in action, then posts the recordings to the site, where the discriminating audiophile can evaluate their "sound signature" for various annoyance factors.

Mr. Chin, who sometimes consults with companies, says the worst emanations are the "pure tones" -- or whines and hums that come from spinning parts or vibrating metal. Also bad are repetitive clicks from a shoddy fan. Less objectionable is the gentle whoosh, which tends to fade into the background. "It's the sound of trees, it's the sound of waves," Mr. Chin says.

Michael Campbell, an engineer in Plano, Texas, said he turned to a quiet PC after suffering with a Hewlett-Packard Co. Pavilion model "just a little bit quieter than this side of a jet engine."

Ameer Karim, an H-P executive, says the Pavilion machines have gotten quieter in recent years, and he says that H-P's internal acoustic testing shows that its machines are "equal to or, in most cases, better than our competitors."

Mr. Campbell replaced the PC with an \$1,800 custom quiet model from Endpcnoise.com, a small Web retailer, about 18 months ago. Mr. Campbell says it was "worth every penny. ... You don't really know that it is running unless you look at the power light."

Jon Schoenborn, Endpcnoise.com's general manager, says interest in quiet computing is picking up rapidly. His offerings include such items as a 70-pound, \$1,200 computer case dubbed the "TNN," for "Totally No Noise." It dissipates heat, entirely without fans, by transferring it over copper pipes to the box's thick metal walls. The price is for the case alone, with no computer inside.

Russ Kinder, an architect in Grand Rapids, Mich., turned to a more radical approach: computer submersion. After setting up a PC that had to run day and night, he didn't want any nocturnal buzzing. So, he says, he plunged the computer into an acrylic tank filled with mineral oil.

Other liquids, like tap water, would conduct electricity and fry the circuitry. But oil is nonconductive. Mr. Kinder says it worked fine as a muffler, so long as he topped off the oil occasionally to replace what had evaporated. He admits the oil gummed up his hard drive until he figured out a way to detach it from the rest of the computer and suspend it above the tank.

Mr. Kuo first became concerned about noise when he hooked up a computer to his living-room TV set in order to watch digital movies on the big screen. Doing so required a faster graphics card, which came with a noisy fan. "It just got to be too much," he said. Whenever the movie got quieter, "instead of hearing quietness, you heard buzzing-buzzing like someone operating a power tool in the next room."

Several modifications later -- which included replacing a few parts and engineering an air duct out of an empty plastic snack cup, sliced in half -- the setup was quiet enough to be drowned out by the ticking of his wall clock.

"My wife, she thought it was perfectly fine," Mr. Kuo said. But he was still bugged. "This is what happens when you start getting into quiet computing. Your standards for how loud is too loud...get lower and lower."

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