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BASICS

### PCs to Be Seen, Not Heard

By PETER WAYNER  
Published: October 11, 2007

JOSH SHENKLE knew that he couldn't hook up any old PC to the 106-inch Panasonic projection television in his home theater. Most computers come with buzzing fans, whirring disk drives and whining capacitors that compete with the sound system.

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Dave Ember

"After a while, the noise gets to you during quiet scenes," he said. "It overwhelms you and takes you away from the movie."

Computer users who want silent offices and living rooms are starting to ask for quiet computers. Manufacturers are taking notice. Some new computers like the [Apple iMac](#) or the [Alienware Area-51 7500](#) are marketed for their silence. A number of other manufacturers are responding by starting to work on quieting their machines.

An aftermarket of parts that people can use to tweak their machines with quieter fans and silent drives is emerging. Some small companies like Zalman are charging more than \$5,000 for ultraquiet machines aimed at sound recording studios and home theaters.

Mr. Shenkle, a technical analyst in Minneapolis, ended up building his own PC inside the Antec Sonata 2 ([www.antec.com](http://www.antec.com)), a computer case engineered to be extraordinarily quiet.

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[Peter Wayner on a Niche Segment of PC Buyers Who Want Low-Noise Computers \(mp3\)](#)

“What’s nice about the Antec 2 is that it has a temperature-sensing power supply with attachments specifically for the fan,” he said. “When the temperature does rise, it will speed up the fans.”

Heat is a product of computation, and every decision a computer makes about a spreadsheet, the color of a Web site’s background or the trajectory of a race car in a game produces a tiny bit of heat. When modern chips make billions of decisions in a second, the heat adds up.

“Most of the noise is related to cooling,” says Mike Chin, the editor of [silentpcreview.com](http://www.silentpcreview.com). “What you want to do is have the most effective cooling flow with the slowest fans.”

Mr. Chin started his Web site more than five years ago when he became annoyed with the loud machines on the market. Today, he makes his living writing on the topic, reviewing products and designing machines for manufacturers like Cool Tech PC ([www.endpcnoise.com](http://www.endpcnoise.com)).

Mr. Chin says that the simplest way to cut noise is to use larger variable-speed fans that run no faster than necessary to keep the computer cool. If the components inside the case are arranged to make it easier for the air to flow smoothly without negotiating tight corners, the work is that much easier.

He also recommends using quieter disk drives and mounting them with special rubber gaskets that keep any vibrations from radiating through the case. These two steps may make the biggest difference.

But Mr. Chin said it was impossible to completely eliminate the noise that comes from the circuitry itself. “In lots of cases, the noise in a power supply or a motherboard is covered up by fans. You make things quiet enough, the buried noises are plainly audible.”

Mr. Chin’s Web site reviews different components by measuring the sound with a decibel meter and trying to characterize the nature of the sound. Both manufacturers and people who want quiet computers read it regularly to compare the sound emitted by various components.

A number of manufacturers are using these tricks when selling complete systems. “Our typical customer is spending upwards of \$2,000 to \$5,000 on a PC,” said Jon Schoenborn of Cool Tech PC. “They’re not looking for cheap stuff. They want top-end parts. They’re looking for an immaculate computer.”

His company tests parts carefully for noise, checks with experts like Mr. Chin, chooses the quietest parts and then experiments with putting them together in the best way. “Assembly here is not a low-skill job,” Mr. Schoenborn said. “Our assembly people are highly trained. You can’t mass-produce these things.”



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The New Y

Other companies are experimenting with more exotic solutions that use heat pipes and large blocks of highly conductive metals, known as heat sinks, to carry the heat from the components to the walls of the case. Glenn Lirhus, the owner and main designer for A-Tech Fabrication ([www.atechfabrication.com](http://www.atechfabrication.com)) in Burbank, Calif., said that some of his computers came with a big block of aluminum for mounting the disk drive, a solution he thinks is better than using shock-absorbing mounts because the block conducts the heat away from the drive without air flow.

“The main problem with the rubber washers is you get no heat transfer from the drive, so you need some air flow,” Mr. Lirhus said.

Indeed, Mr. Lirhus’s machines are a good example of the school of design that believes that large blocks of metal can cool without fans. His company’s cases come with large fins running vertically along the sides. The air heats up around the case, producing a natural breeze to cool the devices without a fan.

Heat pipes are also becoming more and more common. These sealed tubes contain a liquid that will boil near the hot spots and then condense near the cool end, effectively moving the heat.

The Zalman 300 system from the Korean company Zalman ([www.zalmanusa.com](http://www.zalmanusa.com)) uses a network of heat pipes that connect the central processing unit and the graphics card with the case itself, which is lined with big aluminum fins. The case alone is available for \$600 from [www.quietpcusa.com](http://www.quietpcusa.com).

Still, others question that approach, pointing out that moving air is much lighter and more effective than aluminum fins. One fan moving 10 cubic feet of air a minute “can mean the difference of 20 degrees for something like a hard drive,” Mr. Chin said. “Take away that fan, you’ll increase that temperature by 15 degrees.”

Mr. Chin said that on the noise front, the typical ambient noise level in an office was 40 decibels, and that it was not hard to get a computer to be quieter than that. But he said the noise level in his home office was usually about 20 decibels. Getting below that level is “a much tougher challenge, but it can be done with fan-cooled,” he said.

The sound from typical computers is about 35 to 45 decibels, roughly the noise of a refrigerator humming, and it is not unusual to find noisier models breaking 50 decibels or maybe even 60, the level of an office conversation.

The designers are not content to just optimize the level of sound. There are aesthetics to consider, too, so the thin metal of the heat sink is being displayed in much the same way that sports cars come with open wheels that flaunt the size of their brake calipers and the cross-drilled rotors.

Some customers are paying attention. When Carlos Rodriguez, a community manager for



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BuiltForLiv

a Web start-up, built out the PC for his home theater, he turned to a Zalman CNPS9500, a \$49 cooler for the C.P.U. that comes with hundreds of thin copper fins and weighs almost a quarter of a pound.

“It’s got huge heat-sink fins,” Mr. Rodriguez said. “It’s got a 92-millimeter fan. I just can’t hear it at all. It’s big, but it’s also kind of beautiful.”

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