

Make your own PC

\$4.00 (Canada \$4.50)

Those not over-the-counter stocks

Talking to investors for a ride



21707 91% 87% 9 + 7%
 128 33% 31% 33% + 1%
 334 31% 30% 30%
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 6341 20% 18% 18% + 3/4
 363 30 29 29 - 1
 2727 5% 4% 4% - 1/4
 479 8% 8% 8% 3/4
 24%
 206 7% 7% - 1/4
 73 7% 7% - 1/4
 411 9% 9% 9%
 515 7% 7% 7%
 84 2% 2% 2%
 1130 10 9 9% - 1/4
 1806 25% 22% 23% - 1/4
 773 17 16% 16% - 1/4
 35 7% 6% 6%
 24 12% 12 12% - 5%
 15 97% 93% 97% + 3/4
 62 27% 27% 27%
 25 7% 6% 6% - 1/4
 12 4% 4% + 1/4
 3505 15% 15% 15% - 1/4
 220 9% 1% 1% + 1/4
 198 9% 9% 9%
 48 7% 6% 7% - 3/4
 7% 9% - 1/4
 18% + 1%
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Real nerds don't buy computers. They make them.

Plug 'n' pray

By Alex Kozinski

IN MY SPARE TIME I snowboard, bungee-jump and fight paint-ball battles. But for excitement, I build computers.

Why build rather than buy? It's not the price. A state-of-the-art computer built from parts bought on June 16 cost me \$2,800, not including sales tax. I could have had a very similar and fully assembled computer from Gateway 2000 for \$3,200, including delivery. And the Gateway computer comes with a better monitor, a lot more software and at least some technical support.

Still, there's adventure in building your own computer. It teaches you how the computer works and what might go wrong, which means you'll

be able to solve a lot of problems on your own. When the computer becomes out-of-date—as it soon will—you can upgrade by replacing the processor or hard drive, instead of buying an entirely new system. Most important, you get precisely the computer you want—no guesswork.

Many stores that sell computer components, such as Fry's Electronics, CompUSA, Best Buy and Computer City, have at least a 14-day unconditional return policy. If you decide you need a larger monitor or a faster

store, with murals of Polynesian natives typing on computer keyboards, runs a close second. A visit to Fry's is not just a shopping trip, it's a high-tech reconnaissance mission; salespeople and customers carry the buzz on the latest in computer technology.

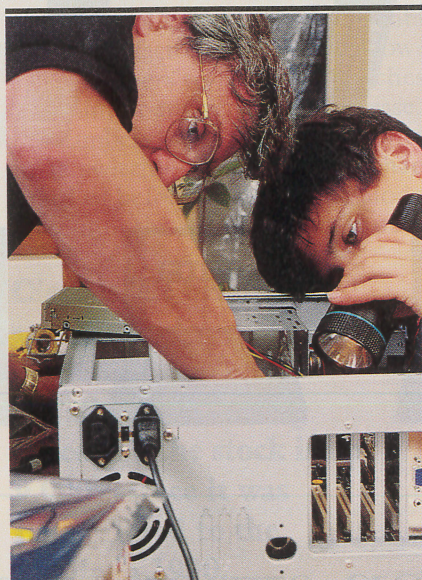
I start by looking for a motherboard—the large circuit board that forms the backbone of the computer and into which you plug your microprocessor, memory and other parts. Picking the right motherboard is very important because it determines how easily you'll be able to upgrade your system. I spend an hour carefully comparing the features of half a dozen boards and finally make my selection. As I reverently put it in my shopping cart, a voice behind me hisses:

"Piece of junk. Returned three of 'em last week." I quickly pick another board and move on to processors.

"Are you getting a 166?" a guy with a yarmulke asks.

"I was actually thinking of a 150," I answer.

"Big, big mistake." He shakes his head for emphasis. "Intel's just come



Shopping list

Pentium 166-megahertz chip	\$532
PCI plug 'n' play motherboard with 512K cache	180
32 megabytes of RAM	285
Minitower case with power supply	60
Seagate 2.1-gigabyte hard drive with 10.5-millisecond access	275
Magnavox 17" monitor	639
Antec keyboard	45
Qtronix trackball	40
Aspen 28,800-bit-per-second modem	120
Diamond Stealth 3D 2000 64-bit, 2-megabyte MPEG video card	190
Audio Wave 32 voice wave table sound card	120
Acer 8X CD-ROM player	109
Mitsumi 1.44-megabyte floppy drive	22
Microsoft Windows 95	178
Total	\$2,795

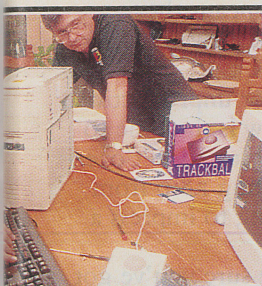
processor or you just don't like the feel of that particular keyboard, take it back and pick out a new one, with no questions asked.

With this comforting thought in mind, I head to Fry's Electronics early one Sunday, shopping list in hand. Southern California boasts several Fry's, huge warehouses stuffed with a dizzying selection of computer equipment and adorned with bizarre decorative motifs. I favor the Fry's in Woodland Hills, which features 20-foot-tall characters from *Alice in Wonderland*, though the Manhattan Beach

out with compression software for real-time two-way voice and video, but it won't run on anything slower than a 166. You'll be frozen out."

I'm not sure what he's talking about, but I hate being frozen out, so I go for the 166.

"And it's stupid to get less than 128 megs of RAM," my new friend adds.



Kozinskis tussling with motherboard; above (clockwise from left), Yale, Alex, Wyatt and Clayton

Par for computer making is ten hours.

"I thought 16 was enough," I say somewhat defensively.

He looks disgusted. "Sixteen? That's like buying a racehorse and clamping a ball and chain on its leg."

We haggle a bit and compromise on 32 megs. That's when I spot the motherboard in his shopping cart.

"Piece of junk," I say. "Returned four of 'em last week."

"No kidding!" He rushes off to get a different one.

And so it goes. Eventually, as the sun sets, I leave Fry's, hungry and exhausted, pushing a shopping cart full of toys.

The next morning my sons and I open the boxes of electronic goodies

and begin snapping them together. We quickly learn that getting a computer working isn't as easy in practice as in theory, and here begins the adventure. One of my sons carefully secures the motherboard to the chassis with half a dozen screws and plastic snaps, only to find it's facing the wrong way. Then nothing happens when we turn on the power. We spend 20 frustrating minutes looking for bad connections before figuring out that the computer is fine, but there's a short in the electrical outlet.

Worst of all, we have the rare bad luck to get a defective hard drive. I run back to Fry's a couple of days later, and they cheerfully give me a new one. While I'm there, they check my prices. Two items are now cheaper, so they refund me \$40.

The trickiest part of building a computer, though, isn't putting together the hardware, but configuring the components. Until recently, each component had to be configured by hand—a difficult and often frustrating task. "Plug 'n' play" technology has eliminated many of these problems, enabling the computer to recognize and configure various compo-

Note from a computer widow

THE ONLY PLACE a man likes to shop more than a hardware store is an electronics warehouse. When he heads off to Fry's, don't expect to see him again until an hour after you've begun calling local hospitals. The process never ends; the computer cover is never completely back on. Yesterday you had no problem running your favorite program. Today you get some incomprehensible message about BIOS incompatibility, and you know he's been fiddling again.

—MARCY KOZINSKI TIFFANY

nents (such as the modem and CD-ROM drive) automatically. Still, the technology isn't foolproof, and it can take hours, even days, before everything works right. About ten hours from beginning to end is par.

Is it worth the trouble? If you think of it as trouble, no. If you want to take the computer out of a box and run it, building is not for you. Indeed, if you are easily frustrated by inanimate objects, you probably shouldn't even attempt to add memory or a peripheral. Get a store or manufacturer to configure your system, and use it until it becomes obsolete.

But if you think of computer making as a weekend project with your children—kind of a high-tech fishing trip—it can be rewarding and educational. I would still caution you not to build your first computer, or any computer you can't wait for, and to buy only components you can return easily and unconditionally. Plan out the project, read the instructions and pump computer-literate friends and colleagues for information; nerds love to show off.

A personal computer is just a bunch of interlocking components, rather like an electronic Lego set. Figuring out what plugs where takes some doing, but there are a number of excellent books on the subject; I recommend *Upgrading and Maintaining Your PC* (Abacus Software 1996, \$35). Still lost? I don't do this for everybody, but what the heck: Write me at kozinski@mizar.usc.edu and I'll try to help.

Alex Kozinski is a federal judge in California.