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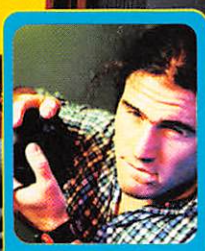

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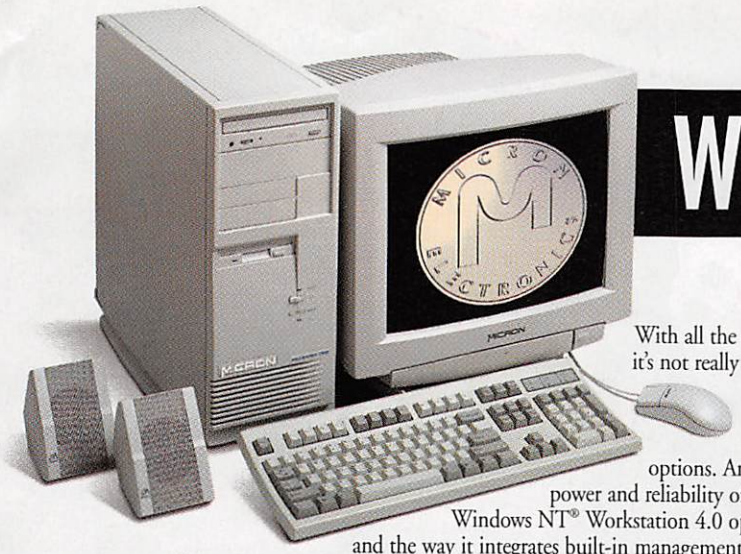

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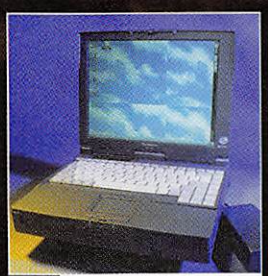
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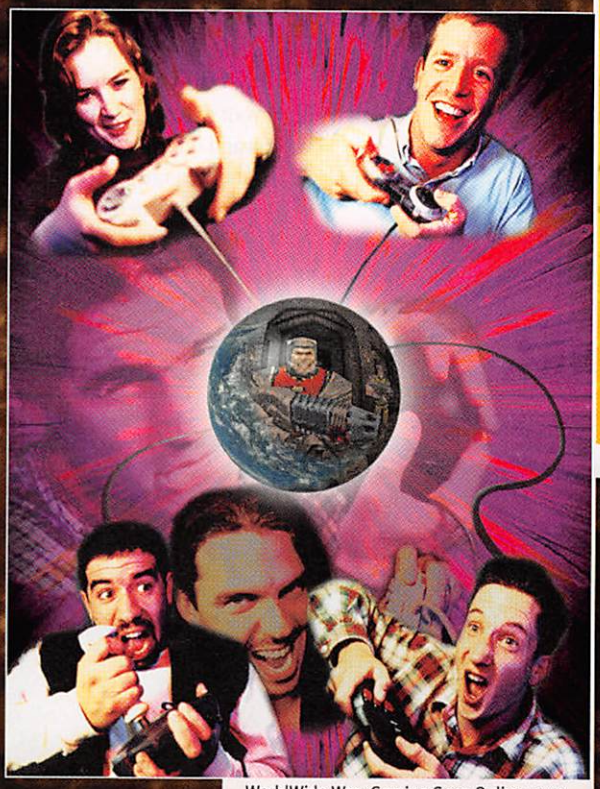

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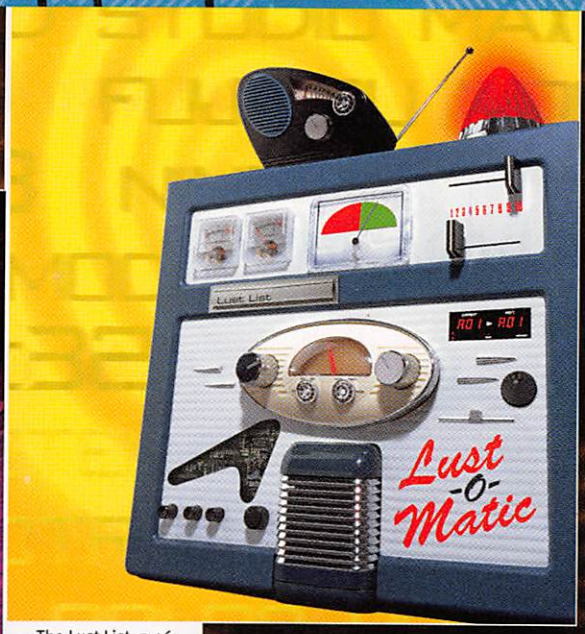

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You've beaten the machine. You've dominated the office LAN. Where can the ultimate warrior find a challenge? Enter the **Internet**. Hundreds of thousands of hardcore gamers gather daily online to square off in computer competition, and the numbers are only growing.

We'll show you exactly how any two gamers can find one another for their slice of martial bliss.

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Every month, *boot* is bombarded with a pile of product, and we present our readers with the rare breakthrough goods that make up "the short list." This mere handful of systems, software, and peripherals are the ones worth considering when it comes time to buy.

At the end of the year, 10 *boot* editors manage to narrow the field down to the 10 items which *really* fired their imaginations. These tech tools and toys make up **The 1996 Lust List**.

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Since the introduction of the personal computer, **Compaq** has been a player, moving from the top to the bottom and, as of last July, back to the top of the list of best-selling manufacturers. Compaq's most recent products are not only priced aggressively, they also incorporate some of the latest cutting-edge technologies. Meet the man behind this transformation.

Rod Schrock

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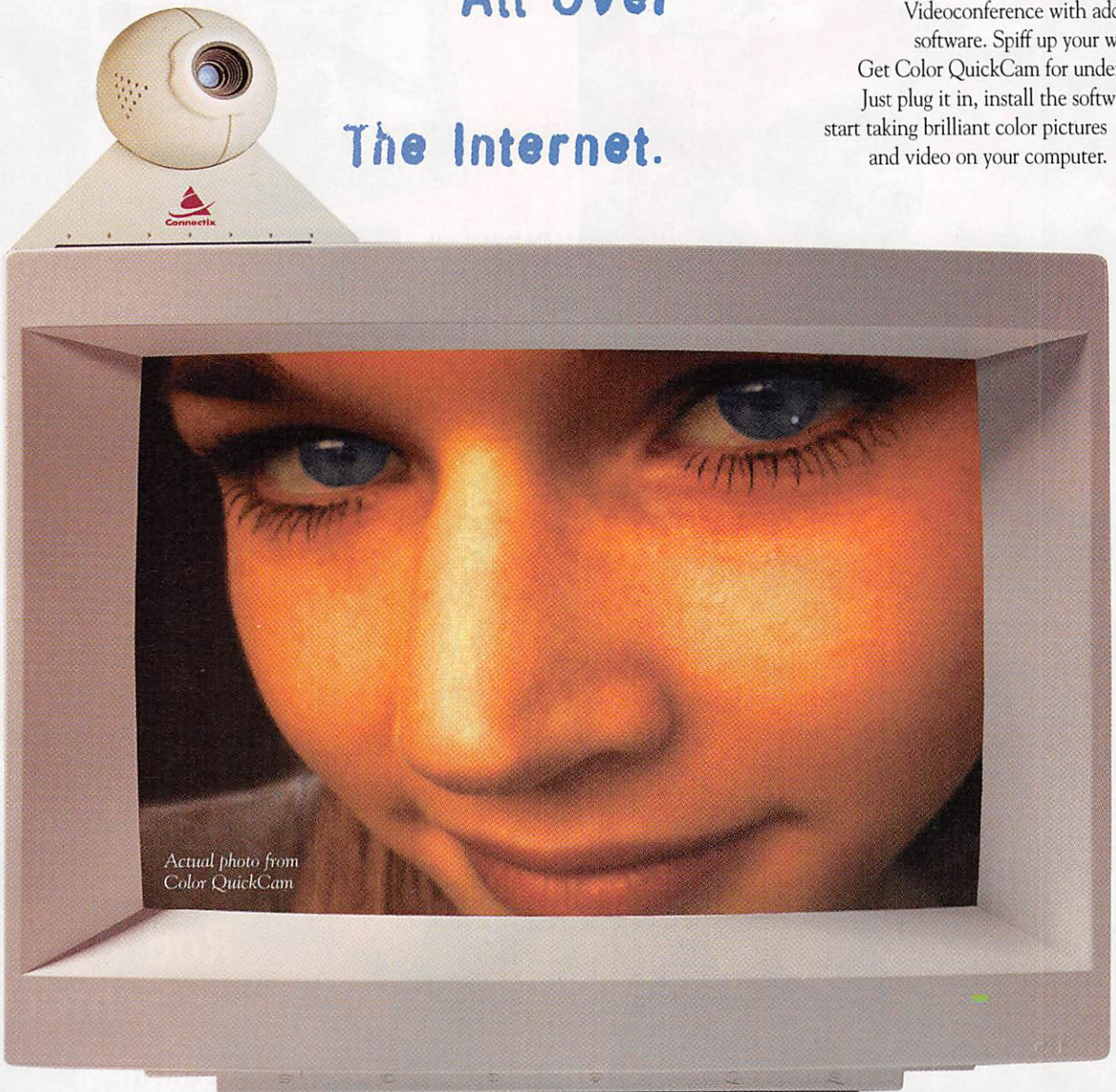

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EDITOR'S WORDS

3D Without the Glasses

It's the kind of language that's likely to draw a crowd (or clear the room, depending on where you're at): trilinear filtering, mip mapping, alpha blending, Z-buffers. Drool, drool. While this sort of talk has been around a long time within the circles of high-end workstation users and the domain of ultraexpensive add-on cards designed to speed up complex rendering, it's also the talk of the latest breed of home PC add-ons: 3D graphics accelerators. And it's the portal to a world of miracles.

Based on the flood of letters and e-mail we receive at *boot* on the subject, the rabid people we talk to at shows and parties, and just hanging out—and our own fascination with the whole idea of *Quake* running at 800x600 with all the speed, polish, and effects we'd expect from a console-based game—it's obvious that 3D accelerator cards are happening.

"It's just like regular *Descent*," I commented, "only, now you're farsighted."

It's a little early to get a real accurate gauge of just how significant this latest "console-killer" technology will be, but judging by the flood of big-name manufacturers rushing in (Diamond, Cirrus Logic, Intergraph) and a recent press release we received announcing ATI had shipped their one millionth Rage chip; it seems like an idea whose time has come.

And costing roughly the same price as a PlayStation or Saturn bundled with a few games, doesn't hurt either. Of course that comparison doesn't take into account the cost of your original system; but unless you're a diehard gamer, your PC does more than just play games. Try laying out magazine pages on a PlayStation or Web surfing on a Saturn. OK, OK... so Sega's promising WWW access from its game console, but with no writable storage and the limited resolution of a typical television screen—you know it's gonna blow.

But is this technology really going to start a revolution? When I originally saw accelerated *Descent* running on a first-generation 3D accelerator, I didn't understand what all the hype was about. When I flew in close to a wall, the texture map just became blurry. No new detail was introduced. In fact, when I flew up to a grille and tried to look through, the blurring effect obstructed my view. "It's just like regular *Descent*," I commented, "only now you're farsighted."

The more I played accelerated versions of all my favorite games, and the better and better the cards themselves became, I gradually began noticing all the details I had been missing before. The drones that buzzed me like so many metal gadflies were all anti-aliased against their textured backdrops: no more annoying jaggies to keep me welded to the knowledge that my game is just a game. Frame rates held so rock solid that I began pumping up the resolutions and color depths to the game's max.

Currently, Sierra's Vérité-based Screamin' 3D is in the P-Pro on my desktop and I'm rediscovering *Quake* in a whole new way. It's like I'm back in a familiar place that I've never been to before, and I'm packing heat, and this time... I've got my glasses on!

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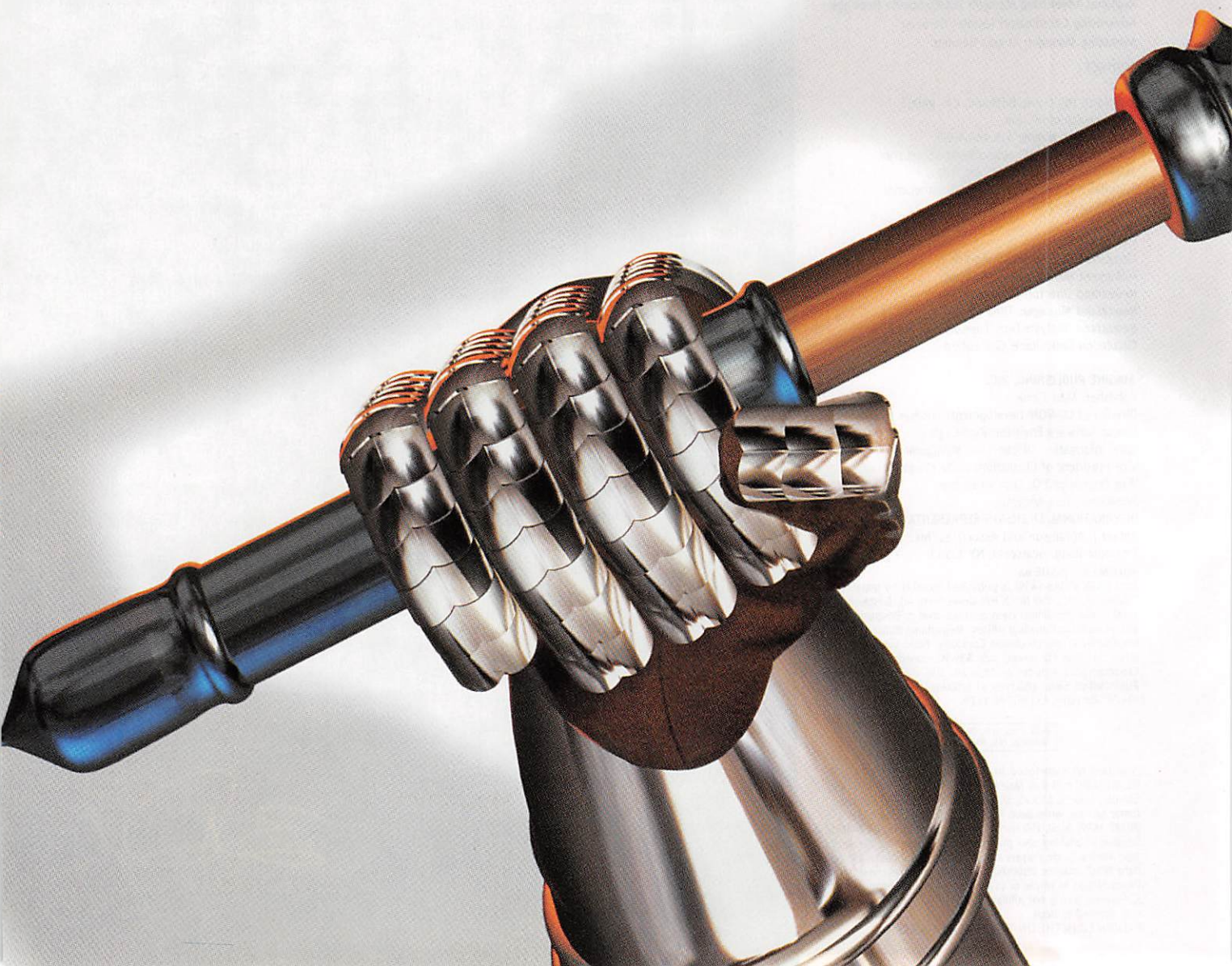

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LETTERS TO THE EDITORS

We've Got The Power

It's a pleasure to pick up a new magazine and see the cutting edge come to life. I have been called a "freak of nature" who would rather talk tech than speak "normal English." Alas poor fools, for it is now that they see me with envy. My techno help sought after, my opinions on anything electronic heeded. We are the leaders of the future and our love for a simple piece of electronic equipment will give us power. Obsession? Bah! I call it dedication (and my girlfriend calls me crazy), and as for what other people say, I take it with a smile now.

Jesse J. Derks
a.k.a. The Smiling Bandit

We Need 3D Card Info Now!

I found out that ATI Rage, S3 ViRGe, and PowerVR are all a form of an enhanced 2D acceleration. So my first reaction was to choose a card from 3Dfx or Rendition. Now you recommended the Matrox Millenium 4WRAM card. What chipset is this card based on? I heard it was 3Dfx. I also learned that Direct3D was built from the Rendition chip that the PCI version of the 3D Blaster was using. Now, I'm totally lost. Is there a way to clear up this mess and tell me which card is the best for the future?

John Lee

We need more info about the 3D graphic card situation, and soon! Many chipsets are available, and software companies are aligning themselves with particular cards. How will I get these accelerated versions? Do I have to buy the right card to get the enhanced version or will the company send a free update? Or will I have to buy a new version, like I did with the Win95 version? What about *Quake*? Creative Labs is going to bundle an enhanced version. Will it be the full game? Will you be able to upgrade to an enhanced version? I need more information, and I need it now!

I love *Quake, Descent, MechWarrior 2, Duke Nukem 3D,* and *Unreal.* What card can I get that will play all the enhanced versions, and give the best performance?"

Michael S. Gilmore

Is the system described in the *boot* 02 editorial the Gateway 166XL? I purchased one of these babies for $3,149 back in April and am very happy with the system. The one thing I always feel beaten by is the technological obsolescence and price curves. My system can now be purchased for less than $2,000... and we're talking less than six months. Should I be mad for not waiting? Do I wait for MMX? It's a vicious cycle and one I often get caught up in.

I guess that's the life we power users lead. I wish my pocketbook was never ending (but it ain't!) so I really need this computer to last me until 1999 or so. At least, as your review mentioned, this machine is quite the upgradable beast. Will I be able to get an MMX overdrive chip? Also, I currently have the Matrox Millenium PCI board with 2MB RAM; do you recommend the 3D Blaster by Creative Labs? What other 3D boards should I consider?

Jonathan Fuhrman

Tech Editor Chris Dunphy replies: The 3D accelerator world is evolving faster than any other area of PC technology inserts. Since most companies are out to make money, it's doubtful that you'll be receiving many free upgrades. Also, unless a software developer is planning to bundle an accelerated version with a specific video card, many won't bother releasing upgrades for existing titles. Remember, the 3D accelerator market is largely undefined, and a bunch of card manufacturers are jockeying for position. Until a winner emerges, many game companies won't bother choosing, under the guise of supporting Direct 3D only.

The Matrox Millenium uses the proprietary MGA-2064W 64-bit graphics chip, and the 3D Blaster PCI uses the Vérité chipset. For your reference, the Orchid Righteous 3D card and the Diamond Monster 3D card both use 3Dfx's Voodoo Graphics chipset. Two of the hottest cards available are:

Rendition Vérité: Very hot 3D technology with good 2D onboard. For the scoop, check out our review on page 79.

3Dfx Voodoo: If you have a high-end 2D card and don't want to part with it, get a 3Dfx-powered card from Diamond or Orchid. Check last month's boot *for the rundown. Voodoo has more 3D power than the Vérité, but is more expensive and less flexible because it can only do full screen.*

Rest assured, boot *will stay on top of this scene, with more coverage than anyone else.*

We are the leaders of the future and our love for a simple piece of electronic equipment will give us power.

Hit and *Myst*

I want to agree with reader Roger Winfield's criticism of T. Liam McDonald's views on *Myst.* Moreover, the editor's response to Mr. Winfield's comments added insult to injury. Why should *Myst* be faulted for spawning low-quality spinoffs? The fault lies with the producers of the spinoff junk!

Michael S. Youngblood

Editor in Chief Brad Dosland replies: We're not bagging Myst. *It was state of the art three years ago. Today, next to* Quake *and* Unreal, *it's tired. But it's still better than all the hangers-on that plaster their boxes with claims of being the next* Myst*-killer.*

Girl Talk

I subscribe to an unholy number of computer magazines, and buy more at the newsstand; and it's been more than a decade since anything hit me like *boot.* I'm sick to death of endless articles about stupid things for even more stupid people. I wouldn't be caught dead with F*amily Computing* or whatever they call it now. (Though I'll admit to owning a copy of "Java Programming for Dummies.")

I've also read enough of the dull technical stuff, which goes too far the other way. Still, I'd read an article about subclassing Delphi VCL components 10 times through before even looking at one about how we need more cute fashion-doll and pink-pony games, otherwise girls can't play with computers.

I play a mean game of *Doom;* I built my P120 development system from the ground up; and I barf at pink ponies... despite being female, and about a week from my 34th birthday.

Reading *boot* is like riding the Ninja at Magic Mountain... playing with the *bootDisc* is like riding it in the front car—TWICE!

I particularly like the 12-Step Program (wish me luck, I'm installing my first SCSI drive this weekend!) and the hardcore hardware articles. Even the stuff I can't afford, I can dream about... though you might want to look into a better paper coating, I find that drool makes the pages stick together.

Jean McGuire

Humiliated by *Freddi Fish*

I'm obsessed with computers, technology, and games. I've been a *CD-ROM Today* subscriber since they started including CD-ROMs with the magazine, and I think the new format is great! With one exception: Where's the children's software? I depended on *CD-ROM Today* to keep me on the cutting edge of "edutainment" for my daughter, so I can pass on my love of computers to her. *Freddi Fish 2* just came out, and I had to read about it *in the newspaper!!!* How humiliating.

Please bring back the great reviews and previews of children's software, so those diehard slavering enthusiasts who are also fathers can still look like heroes when they bring home the great titles you'll review in *boot.* Save me from having to subscribe to one of those lame "family" PC magazines! ("Today we are going to learn where the on/off switch is located!") It will elevate you yet one more notch above mere gaming magazines!

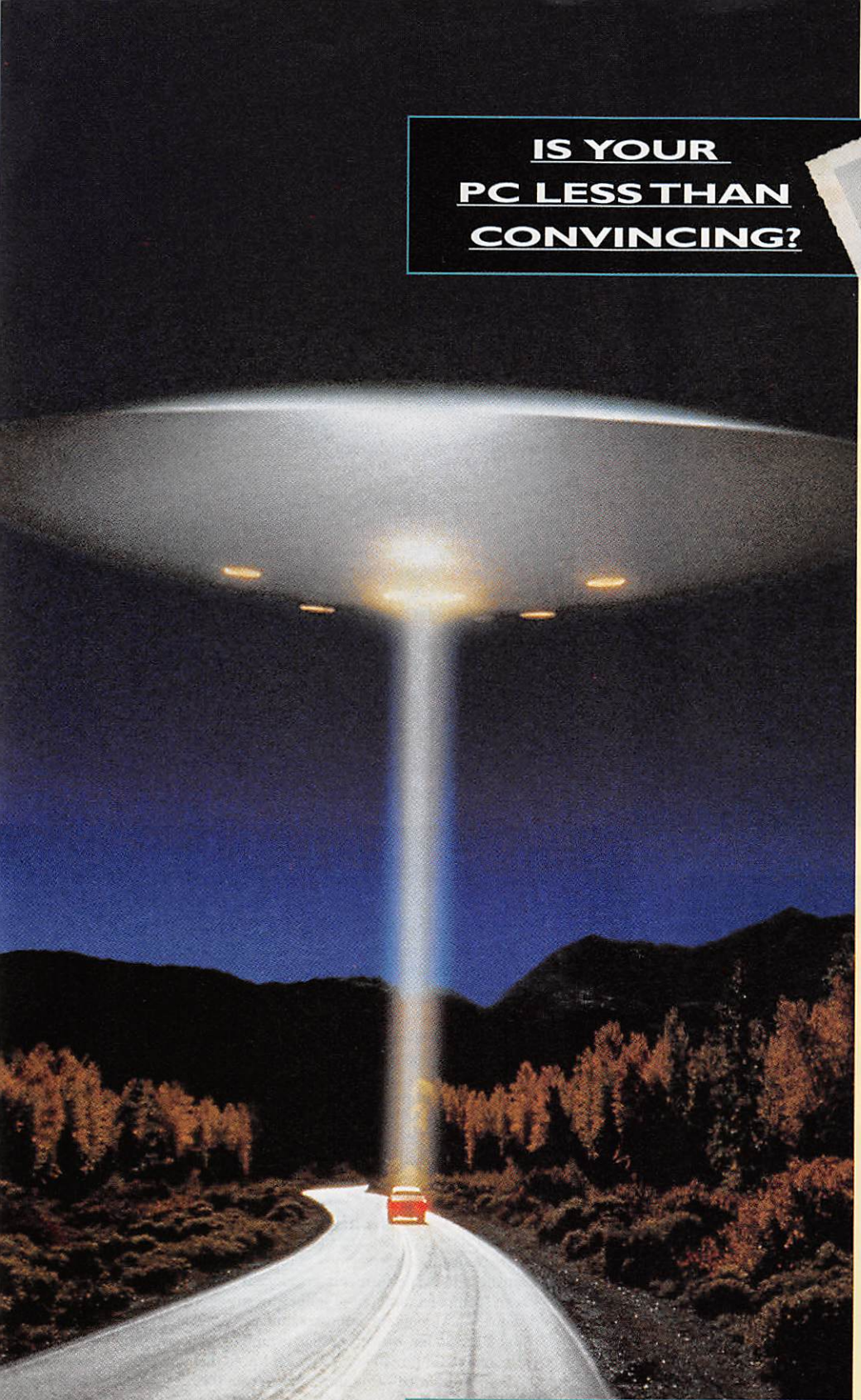
Alan Troup

Reviews Editor Michael Brown replies: We missed Freddi Fish 2*!? I'm hanging my head in shame.*

Seriously, boot *will review education software on occasion, but that's just not the heart of our mission. The titles we*

▶ 10

IS YOUR PC LESS THAN CONVINCING?



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cover will either be very special, or focus on topics that have been neglected. Look for this month's reviews of Solar System Explorer, Building My World, ChemLab, Green Eggs and Ham, *and* Escape from Dimension Q.

CyberFood Groups

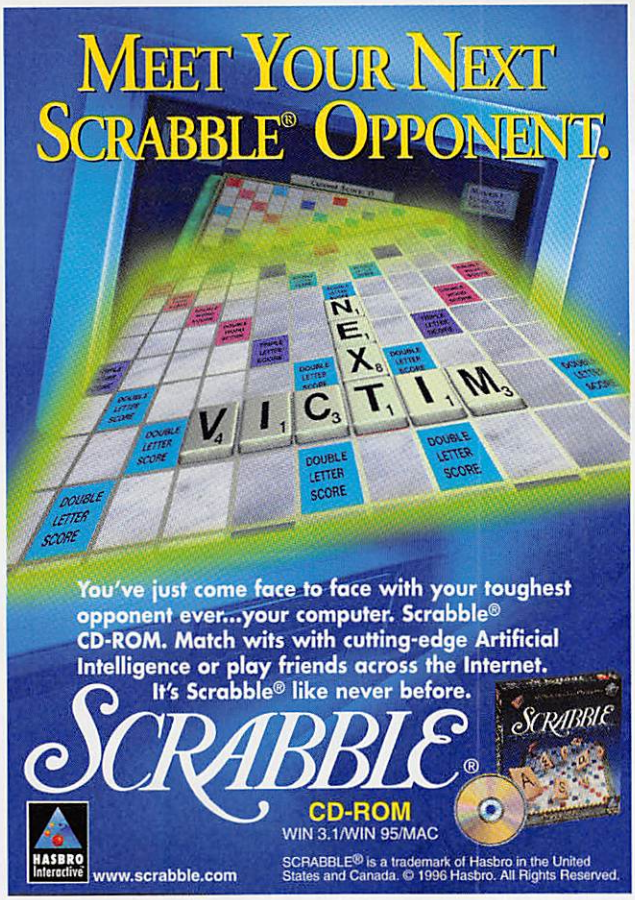
When I started reading *boot*, I could not put the thing down. Each page had brain food prepared just for me. Any questions that were mixing around in my gray matter were answered and it made me hungry for more. A well-rounded meal made up of all the major cyberfood groups.

Now that I have more info, I know what I want to buy, but I don't know who to buy it from. The prices vary and so do the systems, but what about quality and support? Where I work they buy cheap machines that crash and conflict. I don't want this to be the story of my investment in a home PC. Help!

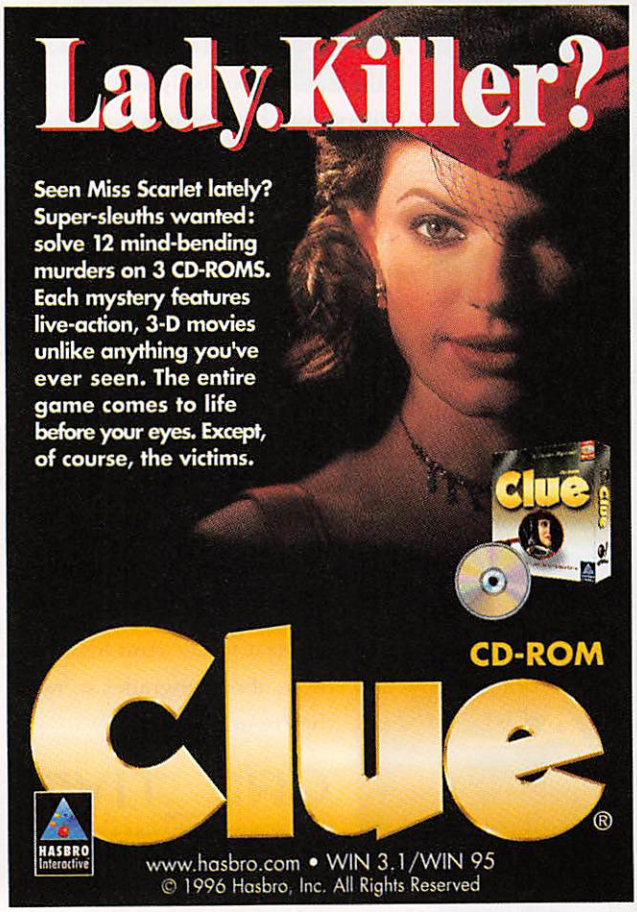
Rich Laiacona

Tech Editor Bryan Del Rizzo replies: Once you've decided on what kind of system you want, shop around for the best price. Accept nothing less than a one year warranty (three years is common and better), and make sure you ask how warranty repairs are handled (many retail chains force you to ship your system directly to the manufacturer).

Big companies such as Gateway 2000, Micron, Compaq, and Polywell offer great products and service, such as 24-hour, toll-free technical support, and Web technical support.



Product Information Number 170



Product Information Number 171

If you're planning on purchasing from a smaller, local, independent store, contact your local Better Business Bureau as a precaution. Whatever you decide, don't forget the old saying: caveat emptor.

Point/Counterpoint

Guess what? Most home power-user lunatics are NOT adolescent game players.

I like your magazine, except for your peculiar misperception that we primarily play games. I never have and never will. And I bet most game players can't afford the big buck high-end PC's that your magazine and I are obsessed with (I have about $50K invested in my PC's hardware and software, and I'm still spending about $2K per month).

Douglas Jensen

I keep abreast of the latest and greatest PC hardware and I believe that the PC's best use is for games. Nothing else pushes the PC performance envelope further. That's why I've spent a fair amount of money for my sound system alone! I have not one, but *two* sound cards working in tandem: the Sound Blaster AWE32 (sound effects), and the Roland SCC-1 (for superior music). Not to mention the Radio Shack mixer (combines input from the SB, Roland, and CD-ROM); the Pioneer SX-203 stereo receiver (for amplification); and a pair of 90-watt Bose Interaudio speakers to make it all happen (none of those tiny little 10-watt pretenders for me!). Now, if only I had the money for that nifty Bose Surround Sound System...

Mr. Ashley Catron

Deadly but Silent

You guys have a great magazine that's really heading in the right direction. It's not as technical as journals, but it's technical enough to be interesting.

However, you wasted a page talking to Daniel Klaussen ("Netscape Goes to War," *boot* 02). I understand someone not being forthcoming, but why bother printing an interview where the subject says nothing. I got more info from the questions than the answers. Alex Edelstein said a little more but it was mostly double talk.

Justin Broderick

Editor in Chief Brad Dosland replies: Not so long ago, Netscape was living large off an inflated IPO and ruled as the superpower of the browser world. Sometimes silence sheds more light than contrived words.

Bad Disc

I really like your format. I certainly hope *boot* has a longer run than *The Net* did. One complaint though, when I tried to run the *bootDisc* I got "unable to read" messages and it locks up my system to the point of having to do a cold reboot before I have control again. Have you received similar notices or is it just my luck?

Fred Barnum

Disc Editor Sean Downey replies: Unfortunately this is not just your bad luck, but ours. We had a bad batch of bootDiscs *go out with the October issue. Our customer service has sent out replacement discs to everyone who has notified us of the problem. We are taking steps to increase our quality control at the duplication plant so this doesn't happen again. Feedback about the* bootDisc *is always welcome via e-mail at:* **bootdisc@bootnet.com.**

BTW: If The Net*'s gone, what are all those people doing over there in* The Net*'s offices?*

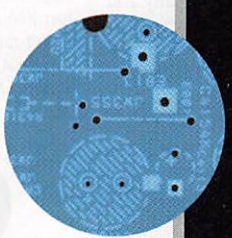
Speed Freak

I just finished reading your article about 8x CD-ROM drives. I was curious; the drives you reviewed rated around 800K transfer rates. I thought an 8x drive would rate 1200K/sec. I have a Chinon 4x drive that benches at 678K/sec, and I know the standard for 1x and 2x drives was 150K/sec and 300K/sec respectively, so why does an 8x drive rate from 640K/sec to 800K/sec. Is this a case of the standards being lowered for some reason?

Bob Lionel

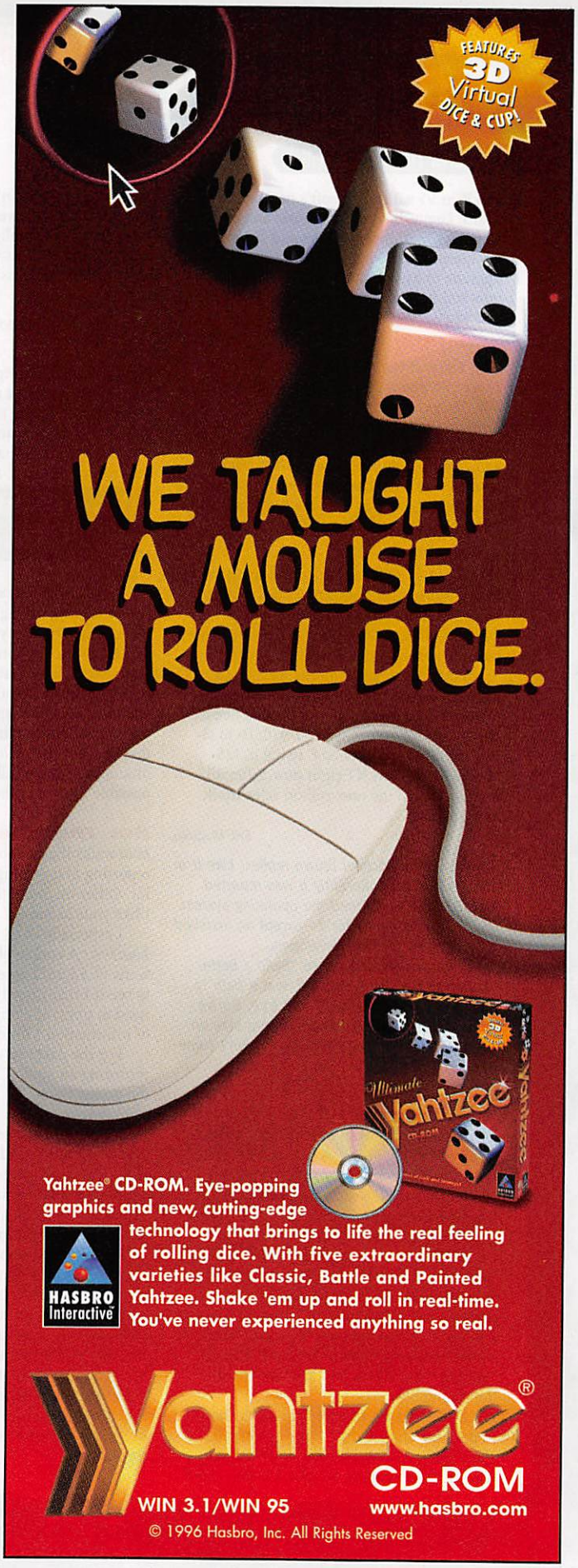
Reviews Editor Mike Brown replies: By definition, an 8x CD-ROM drive is capable of continuous data transfer at 1,200K/sec (eight times faster than a single speed drive). By that measure, all 8x drives are identical. Performance differences don't start popping up until you examine the drive's ability to read files of varying sizes scattered around the disc. Measuring the drive's performance reading files of varying sizes stored on disparate areas of the disc is a better indicator of its real-world performance. The numbers we're reporting are average data transfer rates.

Guess My Vid Card



I Run a Dual Pentium 166 TyTomcat with 128 MB RAM and an Adaptec 2940 UltraWide with three Seagate 2.14GB Ultra Wide Hard Drives; a Plextor 8xPlex CD-ROM with an HP2040i CD-Writer; a SoundBlaster AWE32 and a Number Nine 128 Video Card with a Sony 20-inch Multiscan; dual-booting NT 4.0

▶ 12



Product Information Number 172

commport

LETTERS TO THE EDITORS

and Win 95 with Microsoft's natural keyboard; Logitech cordless mouse; and Altec Lansing ClamShell speakers and subwoofer. My question is: What video card should I upgrade to based on my system? I guess by now you figured out I'm a *boot* subscriber and why!!

tensoft

Tech Editor Bryan Del Rizzo replies: If you're concerned about 3D performance or acceleration, I'd recommend any Vérité based video card, including Sierra's Screaming 3D, Creative Labs' 3D Blaster PCI, or Intergraph's Reactor. If you want to hold onto your current Number Nine card as well, check out any card using the 3Dfx chipset, such as Orchid's Righteous 3D or Diamond's Monster 3D cards.

OS/2 DOA

Like it or not, OS/2 is far from dead. (Just look at sales reflecting *actual* sales, not preloads.) Is it the top-selling OS? No. Is it dying? With a million sales in the first three months of this year, I'd say not.

Win95 runs games pretty well, and I appreciate its improvements over Win3.1. Is it the answer to every computer user's needs? No. As for NT—well, if OS/2 with 13- to 15-million users has "nobody" using it, MS should give up on NT right now. After all, it only cracked the one million sales mark late last year.

Eric McCann

Reviews Editor Michael Brown replies: Like it or not, OS/2 is dead. Recently it was reported that IBM has abandoned the operating system. OS/2 had a lot going for it—except an installed base of users to draw developers.

Unfortunately, the adage "Build a better mousetrap and the world will beat a path to your door" doesn't always hold true. Do we think Microsoft needs competition to stay on its toes? Yes. But that competition won't come from OS/2. RIP.

Responding to Your Oct 96 Editorial...

1. "Should we factor in near-future products when reviewing gear?" A resounding, "No!" Let the reviews deal only with the product you're reviewing. Near-future products are like footnotes; they distract from the subject and cause unnecessary eye movement.

2. "Should we reserve the 'Kick Ass' tag for products that excel in the intangibles?" When I think "kick ass," I think performance—not intangibles. If I were to describe a woman as "dreamy" vs. "kick ass," what would be the difference? My vote: Replace "dreamy" with "kick ass" and just mention the intangibles.

3. "Should we start getting super models to pose for our covers?" Nah—get amateurs. They'll cost less and be more exciting. My wife is 30-something, weighs less and looks better than she did in high school, and would look great on the cover of (almost) any magazine. And, incidentally, she's Sicilian and definitely of the kick-ass persuasion. (Now, what image does a kick-ass Sicilian bring to mind?)

Peter Manse

Editor-in-chief Brad Dosland replies: Send GIFs.

Finally! a decent computer magazine. You have the balance just right, between hardware and software; future technology and cool technology real people can afford right now; and between games and creativity software. I like the critical approach, and the dose of attitude and humor.

When I think "kick ass," I think performance—not intangibles. If I were to describe a woman as "dreamy" vs. "kick ass," what would be the difference?

Regarding the *boot* 02 editorial: I think you are taking the right tack. Yes, *do* review near-future stuff, as you do in bootRadar. I don't want to buy some gadget and find out two months later that something better was in the works. bootRadar whets my appetite and after all, this mag's all about lust. Finally, true technophiles want to be informed about the medium they love, wants to have all the intangibles, and a full grasp of the multiple possible futures of the PC.

Paul

Not *That* Stephen King

boot walks that line between good technology reporting and gaming that I've been looking for. Other mags are too centered on gaming. I like your balance.

I especially loved the balance on the *bootDisc*. A couple of games, the newest versions of *Sound Forge*, *Director*, and *Premiere* to see if I really need to upgrade (and yes, I need to upgrade *Premiere*). Exactly the type of information I need in my life!

For the past two years I've been digitally recording an audio CD in my basement studio on my home PC. And since I'm a software developer too, I decided to add a multimedia track—complete with lyrics, videos, tons of graphics, and about 100 WAV guitar riffs. The audio portion took about a year and a half (it *is* a hobby after all!) and the multimedia portion took about two months. I even did the artwork on my computer.

With my desktop computer, I have the creative power of a large media company and can circumvent the traditional production process. I think we're going to end up with a lot of content (good and bad). But that content will survive because people are into it. It's gonna be content that's a lot less sterile than the next Whitney Houston smash hit and it's gonna make the money players shake in their boots because they can't get a slice of the action!

Stephen King

Happy, Shiny People

The shiny plastic wrap is brilliant. Whoever thought of it deserves a raise. It made me notice your magazine apart from the myriad on the racks. Eight dollars is the most I've ever spent on a magazine—it was worth it. You guys have a gritty edge and some really amazing insider tracks on the PC market (I had never even heard of Merced until I read your article about it). Great product, worth the money.

Murtz

Director Laura Morris replies: I'll be looking for that big raise in my next pay envelope. Thanks for writing in, Murtz!

Simple Ratings

I was subscribed to *CD-ROM Today* and when you guys made the change, I was not let down. One of the things that turned me on to *CDRT* was the reviews section, which used a rating system of one to five discs, and was really easy to understand. One was crap and five was a must-buy. But now you have a percentage system and it's harder to determine what's good and what's not.

Jordan Frazer

Reviews Editor Michael Brown replies: You're absolutely right, and we've changed our rating method to reflect that. Check out page 78 for a full explanation of boot*'s new reviews section.*

Madonna Made Us Do It

I was unfortunate enough to read your little preview of the "Evita" soundtrack from the most famous woman of the modern era, Madonna. I was extremely disappointed that your write-up was contaminated with the typical uninformed negative rhetoric about Madonna. Not only that, but your article barely manages to be factually accurate. The enhanced-CD format is hardly dead: Gloria Estefan and Michael Jackson released enhanced CDs this summer. If the format is doomed, as you claim, then I can't think of a better way to rescue it than this epic release!

Gordon Murray

Editor in Chief Brad Dosland replies: You'd be surprised at how many responses we had just like this. Good thing we didn't talk about the Kook-Formerly-Known-As-Prince's Broadway portrayal of Mother Theresa.

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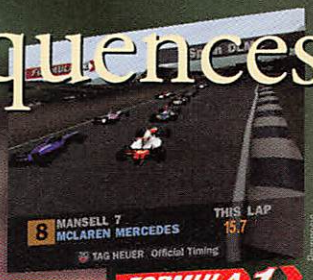
Absolute POWER. NO Consequences.



Hottest Titles. At last you can experience the absolute power of 3Dfx Interactive's premiere 3D graphics accelerator, Voodoo Graphics,™ on your PC or at the coolest arcades with these hot new game titles. These games are optimized to take advantage of Voodoo Graphics blazing speed and life-like graphics, with killer special effects, the other guys can't handle.

Absolute **power** without the **consequences.**

This kind of thing **just doesn't happen.**

Until now.

Coolest 3D. Voodoo Graphics enables photorealistic graphics AND real-time interactivity, so your games look amazing without the consequences of diminished performance. Products that incorporate Voodoo Graphics are available this fall from Atari Games, Diamond Multimedia, Falcon Northwest, Hewlett-Packard, Interactive Light, NEC, and Orchid Technologies.

Only titles optimized for the Voodoo Graphics 3D accelerator chipset perform like this, so look for the *3Dfx Powerfield* on multimedia kit packages, game titles, and arcade cabinets and attract modes for the most mind-blowing photorealistic game experience possible.

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These 3Dfx Interactive Partners make **hot games happen!**

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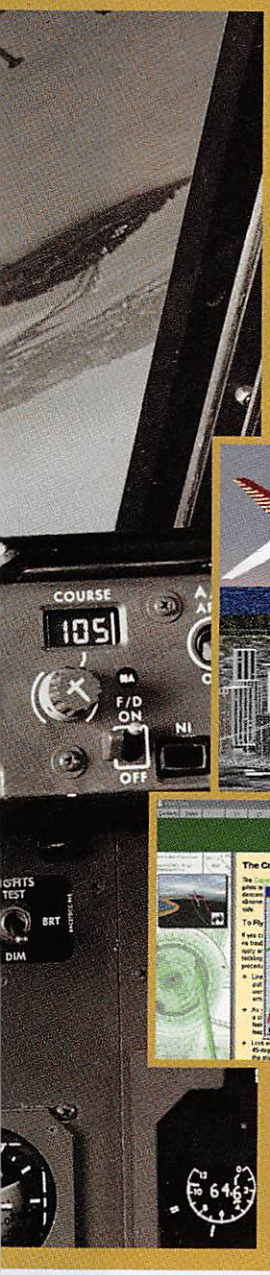
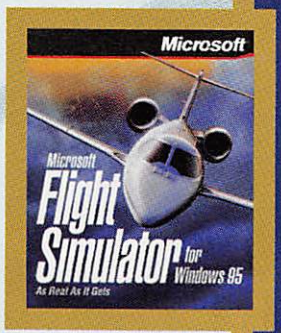
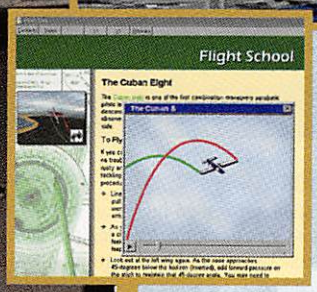


Captain Mathis knows how the love of flight can take hold and make you want to roll your plane, he just feels it's best to save stunt flying for your Extra 300S aerobatics plane.



The sensation of piloting your own aircraft is now attainable in the time it takes to pop in a CD and click a few buttons. The Microsoft® Flight Simulator for Windows® 95 intuitive interface, flying lessons by a virtual pilot instructor, and multimedia demonstrations get you up and flying your first time at the controls. Master flying basics and then, after logging some time, take on some of the more advanced challenges in any of the six planes in your fleet.



You'll soon come to believe that the Golden Gate Bridge was erected just so you could loop around it. Take off from Paris in your commercial Boeing 737-400; instruct your passengers to look out the left side of the plane to see the gardens at the Palace of Versailles. Or take your private Learjet 35A to Vegas; read the marquees on The Strip before landing. Microsoft Flight Simulator for Windows 95 graphics gives you geographical and scenic detail just that vivid (assuming you're not flying into a fog bank).

To view a 60-second sample video of true simulator flight that's as real as it gets, buzz us at www.microsoft.com/games/fltsim/

Microsoft

Where do you want to go today?®

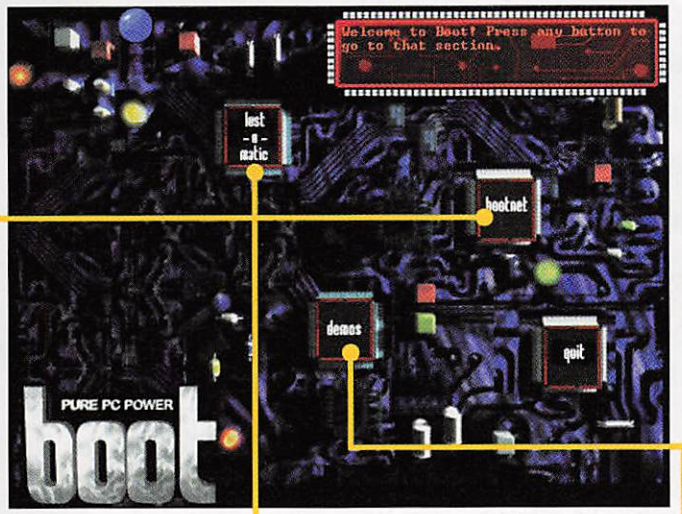
Expansion Pack with southern California scenery, challenges, and adventures available soon.

boot DISC

welcome
to the Forth Edition of the beautiful bootDisc!

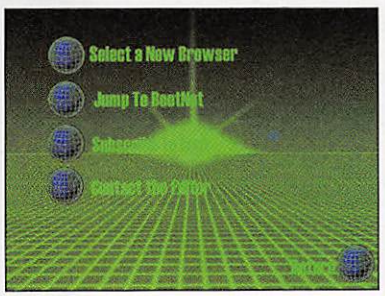
Every month, ***boot*** magazine comes bundled with 550+MB of exclusive demos, and the hottest software around. So slam this issue of the ***bootDisc*** into your CD-ROM drive and give yourself an injection of **Pure PC Power**.

The ***bootDisc*** is compatible with both Windows 95 and 3.x. (Simply run bootCD16.exe to launch the interface under 3.x.) ***boot*** recommends a Pentium 90 or better with 16MB RAM for access to all the software included.



Navigation

If you're unsure what a particular button does, rolling the cursor over it will bring up Help in the display box at top right. Background sound can be controlled with the blue slider at top left.

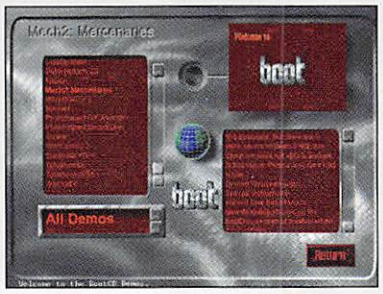


bootNet

The ***bootDisc*** integrates Internet connectivity; allowing you, at the press of a button, to contact ***boot***, subscribe electronically to the magazine, or jump to our ***bootNet*** Web site. Don't worry about browser compatibility—we let you select your preferred browser.

Feature: Lust-o-Matic

With the Lust-o-Matic you can create a your own personalized list of our Editors' choice products, tailored to your unique needs. Cranking the category's slider to the right sets the amount of lust you have for items with that attribute. Once the Lust-o-Matic spits out its results, just click on the name of the item to see a description of it.



Demos

Clicking an application brings up information, and a screen shot. Pressing the ***boot*** logo launches the application (or in a few cases, brings up a window to allow you to launch the program). Check for special instructions to find out about any limitations a demo may have. The Video button turns green when a video is available. Press to play. Clicking on the globe fires up your resident browser and takes you to the application's Web site.

A Special Note from the Disc Editor

There were too many problems with the *MechWarrior 2: Mercenaries* demo to put it on this month's ***bootDisc***. Because the problems were not discovered until the last minute, we were unable to pull it from the polybag cover. Please accept my apologies for this and look for the *Mercenaries* demo on next month's disc.

check out boot on the web

http://www.bootnet.com

bootNet sports many of the exciting **features** that make ***boot*** magazine such a valuable resource to the hardcore **PC** enthusiast. There are **reviews** and previews, **bootWorthy products**, and an expanding archive of *boot* **articles** from past **issues** online for easy reference, **complete** with a search engine.

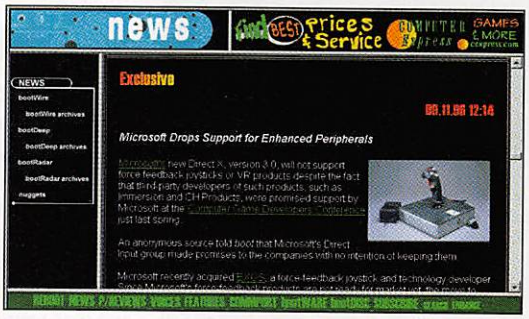
Want a second opinion before plunking down $500 on that snazzy new PDA, or just want to drool over the latest technology that no mere mortal could afford? Come check it out and follow the links for more detailed info!

Of course all this cutting-edge technology comes at a price: You'll need a JavaScript and Frames-capable browser (we recommend Netscape *Navigator* v3.0); a minimum screen resolution of 800x600; and 16-bit color for optimal viewing. The site is graphics intensive, and you'd be wise to view it with something *faster* than a 28.8Kbps modem if at all possible—now's a good time to get that ISDN line.

If you're always climbing to the pinnacle of the fast-paced tech world, you probably have access to these basics; if you're standing still, get your boots on!

NEWS:

bootWire features the latest news; bootDeep gives you in-depth analysis of the key stories broken on the bootWire; and bootRadar picks up the latest cool PC products appearing on the horizon.



P/REVIEWS:

Here you'll find no-bunk reviews and advanced previews of all the PC hardware and software you care about.

FEATURES:

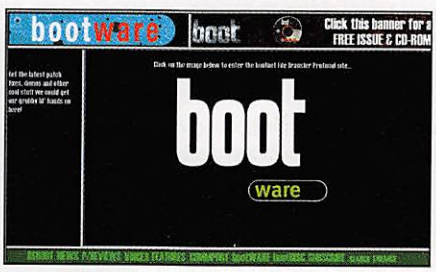
Showcasing the feature articles that appear in *boot* magazine each month.

COMMPORT:

Want to contact us? We want to hear from you. This section is the most interactive part of *boot*'s Web site. It has letters to the editor, and a profiles section introducing our staff. Plus a list of advertisers' links so you can find out more about their products.

SURVEY:

Help us to help you get more of what you need. Let us know what you're looking for in a magazine by filling out the *bootSurvey*, and have the chance to win software prizes.



bootWARE:

Get your grubby lil' hands on the latest downloadable drivers, patches, and coolest demos around.

VOICES:

Columns by *boot*'s connected writers, a few words from our editor, and some special guest contributions.

NUGGETS

The Return of the Sequel, Part 2

We loved them the first time around. They were still pretty good the second time. But now they've worn out their welcome. The games that wouldn't go away and the people who shelled out good money for a rehash, in this month's episode of the Nugget List...

Crusader: *No More!*

Voyeur III: *"I Won't Watch Anymore"*

Elroy *Goes Away Forever*

Madden 99 *Bottles of Beer on the Wall*

Descent III: *Into a Creative Void*

Hardball 7: *On Strike*

NASCAR Racing III: *Four Flats and a Funeral*

MechWarrior 2: *Mercy!*

Leisure Suite Larry 8: *Out of the Closet*

Lemmings: *Ethnic Cleansing*

Ultima X: *Lord British Meets Traci Lords*

Penultimate Doom: *id Needs Money*

Command & Conquer III: *Bury the Dead*

Don't Get Mad, Get Plaid

Monarch Design Systems has developed Plaids & Stripes, a new plug-in for *Photoshop* that you don't want to be without. Plaids & Stripes can render simple or complex plaid and stripe patterns directly within *Photoshop*. The cheery patterns you create can be saved as graphic files or printed out to impress your Scottish mates. Plaids & Stripes also includes a Library of Yarn Structures to create such compelling patterns as Oxford and Twill.

Downsize This!

In the face of lagging sales and an oversaturated market, 1996 will not be a pretty one for many hardware and software companies. We've already seen major downsizing and management changes at leading tech firms, and the brutal cutbacks that the year is ending with may signal the end of bloated development costs.

Philips Media went through major downsizing in October, laying off 120 employees. Philips attributed the move to its lack of sales, and the general state of the market. The skeleton crew of 16 employees is still committed to bringing out *Total Control Football* and *The Babysitter's Club* for the PC.

Acclaim announced a 10 percent reduction in their work force, resulting in 62 employees getting the ax. The decision was based on the declining market for video games.

Viacom New Media is killing off its New York City sales, marketing, and development office. Virgin Interactive Entertainment, based in Irvine, Calif. will take over the sales and marketing of Viacom's software. The downsizing will affect 70 employees, and only five employees have been asked to stay on to help Virgin's struggling management. The cutbacks will have no effect on Viacom's Illinois development office.

DVD

Last Seen Driving a White Bronco

Even though DVD manufacturers are still haggling over copyright issues, DVD-ROM software is expected to make deep cuts into the sales of CD-ROMs as early as next year. According to analysts at SIMBA, DVD-ROM could generate sales of up to $100 million annually by 1999. The same analysts expect DVD to begin making its mark next year, projecting sales upwards of $35 million.

This from an emerging technology that can't seem to work out the piracy snags that are keeping *Smokey and the Bandit Parts 1 and 2* from our desktop PCs.

But, several companies, including major DVD-backer Toshiba, are still committed to the CD-ROM market, and have begun shipping 12x CD-ROM drives. Toshiba predicts it will take the rest of the century before DVD-ROMs outsell CD-ROMs by a factor of almost 2-to-1.

Gimme an M, Gimme an S, Gimme an N What's That Spell?

Microsoft has reintroduced the Microsoft Network, despite initially being plagued by poor planning, service outages, and performance that, at best, seemed as fast as a three-legged dog. MSN is relaunching with a new flat fee of $19.95 per month for unlimited use, and providing better content, including: news, sports, music, soap operas, online shopping, computer products, chat rooms, and (gasp), even an online game show ("I'll take Windows NT trivia for $200, Alex"). With 1.6 million subscribers—most of them Microsoft employees—MSN is the third largest online service, behind CompuServe (4.5 million) and America Online (6.5 million).

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Costa Mesa, CA 92626
(714) 428-2100

Product Information Number 274

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AMD Silences Interwave Audio Chip

Integrated "solution" couldn't overcome performance and compatibility problems

AMD has confirmed that it is ceasing production of the Interwave chip, its highly-touted wavetable audio processor chip, currently being used by high-profile companies including Compaq, and other sound card manufacturers.

Dean Grumlose, Marketing Manager of Multimedia Products for AMD told *boot* that AMD has decided against additional development of the Interwave chip, and has no plans to develop sound chips or audio solutions. Grumlose also revealed that AMD has pulled all its resources to concentrate on the upcoming K6 processor chip. As a result, the majority of employees in AMD's audio group have been laid off, with very few being offered relocations or job transfers.

Although AMD declined further comment, this abrupt decision reflects the company's inability to penetrate Intel's processor stranglehold on the market.

AMD has long struggled to gain sales and market share, and it didn't make financial sense for the company to keep the audio division afloat—especially when their K5 and K6 processor divisions couldn't keep pace with worthy competitors such as Cyrix and Motorola.

And although AMD claims the Interwave was a unique and integrated sound solution, the chipset suffered from a lack of hardware Sound Blaster compatibility, causing numerous headaches for consumers with Interwave-based products. In fact, a *boot* source revealed that Compaq had a bug list with more than 500 performance and compatibility complaints about the Interwave chip that AMD was unable to fix.

> "We selected the Interwave for its audio performance. Quite frankly, we didn't put enough emphasis on the Sound Blaster compatibility... That was a mistake on our part."
> — *Rod Schrock, Vice President of Compaq*

Rod Schrock, Vice President of Compaq, told *boot* (see this month's Lip interview, page 32) his account of the audio problems that plagued Compaq's new 8000 series: "We selected the Interwave for its audio performance. Quite frankly, we didn't put enough emphasis on the Sound Blaster compatibility. There's no getting around that. It's not a hardware compatible Sound Blaster card. That was a mistake on our part."

AMD still has a large inventory of Interwave chips, and intends to support its existing customers until the end of '97. However, Compaq recently disclosed to *boot* that it had already decided to replace the Interwave solution with a hardware Sound Blaster compatible card in the spring refresh of its PC line. And, since Compaq was AMD's largest Interwave customer, its decision to scrap the chip possibly prompted AMD's decision. Joystick and sound card manufacturer, Advanced Gravis, is also currently using the Interwave chip in its line of UltraSound audio cards, but has no intention of using the Interwave chip in its new line of products, opting instead for a new sound board based on the original GFI design called "Viper."

— *Brad Craig*

***Brad Craig** is a seasoned veteran with 10 years experience in marketing and development for software and hardware companies, and is a contributing editor for* boot.

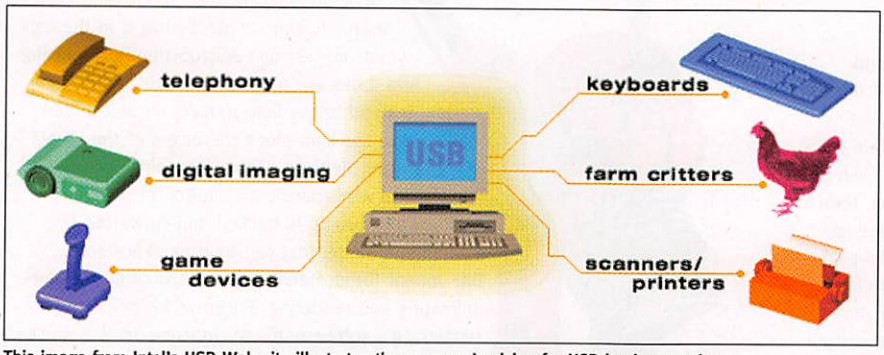
Modem Speed Limit Raised to 56Kbps

Rockwell chipset delivers simple alternative to ISDN

Shiva Corporation intends to deliver 56Kbps technology from Rockwell Semiconductor Systems in its remote solutions for small offices, home offices, and central corporate sites. This alternative to ISDN will allow simple upgrades through modem cards or software applications. The new 56Kbps technology will deliver twice the performance of V.34 modems, but still substantially less than ISDN, T1, or T3 connections. However, since most home offices or small businesses make calls to connect to their corporate LANs, they'll be able to take advantage of faster speeds while paying a flat fee rather than the per minute charge typical of most ISDN connections.

Rockwell is strong in the PC and notebook market with more than 50 percent of the market share, and will strive to make this the de facto connectivity standard. Armando Geday, vice president and general manager at Rockwell, added, "Shiva is a critical partner for Rockwell. Our modem technology, coupled with Shiva's award winning remote networking equipment, today allow thousands of users to seamlessly connect to corporate LANs and the Internet at speeds of 28.8Kbps with 4-to-1 rated v.42bis compression. Our new 56Kbps technology will provide users with a performance boost of up to 224Kbps with compression."

— *Brad Craig*



This image from Intel's USB Web site illustrates the company's vision for USB implementation.

USB Revealed

Say goodbye to all those ports

Universal Serial Bus (USB) is a peripheral bus standard developed by Compaq, DEC, IBM, Intel, Microsoft, NEC, and Northern Telecom that will bring true plug-and-play to computer systems once and for all. Ideally, USB will be the ubiquitous PC peripheral connection and eliminate the need to install cards into dedicated slots to reconfigure your system.

USB will make the PC much easier to use by replacing the cumbersome parallel, RS-232, game, keyboard, and mouse ports, and allow you to connect up to 127 devices simultaneously. USB will allow you to hook up telephones, modems, mice, CD-ROM drives, joysticks, tape and floppy drives, scanners, printers, and more to your PC using one standard connectivity solution.

"USB provides a single connection allowing for high-speed bidirectional communication," says Jim Pappas, Director of Peripheral and Interconnect Technology at Intel *Architecture Labs*. "Intel is committed to this technology and has been shipping production silicon since June. By using USB, even consumers intimidated by the PC can switch out compatible peripherals as easily as they would plug in a lamp.

By using USB, even consumers intimidated by the PC can switch out compatible peripherals as easily as they would plug in a lamp."
— Jim Pappas, Intel

USB draws its intelligence from the host PC, automatically detecting when devices are added and removed. The bus automatically determines what host resource (including driver software and bus bandwidth) each peripheral needs, and makes those resources available without user intervention.

Its 12Mb/s data rate will also accommodate a whole new generation of peripherals, including MPEG2 video-based products, data gloves, VR headgear, and digitizers. And, since computer-telephony integration is expected to be a big growth area for PCs, USB will provide a low-cost interface for Integrated Services Digital Network (ISDN) and digital PBXs.

Companies such as Compaq and Fujitsu have already incorporated USB ports in their hardware and are paving the way for others to follow. For consumers with non-USB equipped machines, USB Host Adapter PCI add-in cards will be available from numerous manufacturers. Although USB has taken a while to rear its head in the marketplace, 1997 promises to be a very exciting time for the PC.

— BC

Internet II: The Sequel

New worldwide computer network expected to be 10 times faster

Tired of Internet traffic jams and crass commercialization on the Web? Take heart, you're not alone. A group of more than 30 research universities and technology companies is so fed up with the slowdowns that they're developing a new worldwide computer network, dubbed "Internet II."

Internet II is expected to cost more than $300 million to create, but each university (including Cornell, Harvard, Princeton, and Yale) will cough up $25,000 the first year, and $500,000 per year for the next three years to keep the project afloat. The project has already captured the interest of companies such as IBM, AT&T, and MCI who will assist in the development and construction of the alternative Internet.

Participants in the project predict the new Internet will be at least 10 times faster than the current model, and offer new technologically-advanced applications. However, the primary focus of Internet II will be to provide an effective platform that fosters collaborative research projects between universities thousands of miles apart.

Still, not everyone is impressed. Martin Dubetz, Director of Academic Computing and Networking of Washington University said his school declined to participate because, "We're not really having any connectivity problems—we already have a T3 line, and so do most of the people we talked with."

President Clinton also stated his intentions to create a bigger, better Net, shifting $100 million from various Pentagon and domestic programs in fiscal 1998 to create a "Next Generation Internet."

— BC

pure lust

HIGH-TECH **TOYS** AND **TOOLS** WITH THE RIGHT STUFF

You Are Here

No sense of direction? Likkuva's **Retki GPS Land Navigation System** can turn your notebook PC into a high-tech road map that never needs folding. Using the military's NavStar Global Positioning System (GPS) satellites, the Retki picks up your vehicle's latitude, longitude, and elevation, then displays a moving icon of your vehicle on the PC map display. The $595 package comes complete with a PCMCIA card GPS receiver and antenna, navigation software, and a disk-based local sector map of your choice. Additional regional maps are available for $199.95 each. Just make sure you have a co-pilot to watch the screen while you keep your eyes on the road.

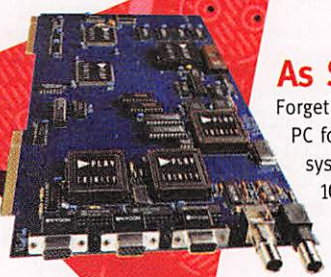
Likkuva; 916.676.0690; www.likkuva.com

Give This One a Hand

Why build it spline by spline on screen when you can simply digitize it in the real world? Immersion's **MicroScribe-3D Digitizing Arm** looks like a polished robot arm. But instead of the limb moving an object, you move the limb along the edges of the object you want digitized (inside the unit's 50-inch spherical workspace). The motion of the MicroScribe's stylus tip is tracked and converted into a wireframe model that can then be exported in DXF format (other translators are also available) for animating and rendering. Priced at $2,995 without Immersion's software, the MicroScribe-3D is a must-have if you want to breed digital dinosaurs from toys or create custom cars on your PC.

Immersion Corp.; 408.267.1900; www.immerse.com

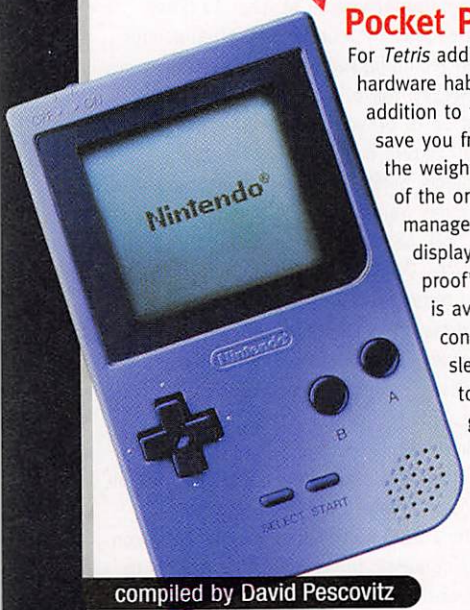
As Seen on TV



Forget the big networks, Play's **Trinity** brings broadcast-quality video production into your PC for as little as $10,000. From the people who brought you the Snappy video-capture system, Trinity is a full-on production studio in a sleek, rack-mount box. It boasts a 10-input switcher, timeline-based editor with machine control, two channels of digital video effects, chroma keyer, color effects processor, digital audio mixer, and two time-base correctors. Four potent software packages tie it all together. Add the right configuration of third-party products and the Trinity transforms into a linear or nonlinear editor—or even a 3D-animation powerhouse. Point... Click... Action!

Play Inc.; 800.306.7529; www.play.com

Pocket Pool



For *Tetris* addicts who need to hide their hardware habit in a shirt pocket, this new addition to the 8-bit Game Boy family will save you from your boss' wrath. At half the weight and just 30 percent of the size of the original, **Game Boy Pocket** still manages to feature a 2.6-square-inch display, enhanced with new LCD "glare-proof" technology. Head-to-head play is available using the Game Link connector sold separately. With a sleek silver finish and the ability to play all of Game Boy's 440 games, the $59.95 Game Boy Pocket should be standard issue at all boring jobs.

Nintendo of America Inc.; 800.255.3700; www.nintendo.com

The SUV of Notebooks

Perfect for construction sites, crime scenes, and mountaintops, Panasonic's **CF-25** ruggedized notebook PC is water and dirt resistant. The entire case is made of a magnesium alloy, and it even has a built-in handle. The hard disk and floppy drive are mounted in shock-absorbing compounds, and the keyboard and touchpad are sealed to protect the PC's circuitry from acid rain—or coffee. An antitorsion magnesium frame protects the 800x600 SVGA active-matrix color LCD panel. The 7.8-pound CF-25 is available in two configurations: Intel Pentium 133MHz CPU with a 1.35GB Hard Disk ($3,700) or Pentium 100MHz CPU with an 840MB Hard Disk ($3,400).

Panasonic Personal Computer Company; 800.662.3537; www.panasonic.com

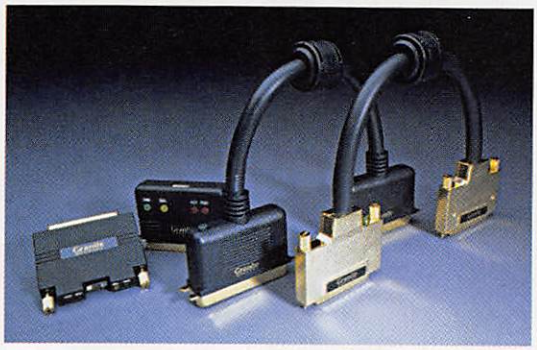
compiled by David Pescovitz

Space is the Place

It's true. NASA astronauts really do carry Fisher Space Pens into orbit. The pen's place of honor in the Space Age is a result of the patented nitrogen-powered cartridge that pushes ink to a carbide ball at the pen's tip at three times atmospheric pressure. That means you can write upside down, underwater, or in zero gravity, and the ink won't clog. This pen will also work at temperatures ranging from -50°F to more than 250°F, even if you won't. With its compact size and sleek chrome plating, Fisher's $17.50 **Bullet Space Pen** is the perfect high-tech word-processing utility for those rare pen-and-paper moments.
Fisher Space Pen Co.; 800.634-3494; www.spacepen.com/spacepen

Worth Their Weight in Gold

SCSI is a beautiful thing—when it works. Errors, data corruption, and system crashes can be caused by bad cables and terminators. Granite Digital saves the day with their line of **SCSIVue Active Terminators** ($59 to $99) and Gold Cables ($69 to $249). The Active Terminator automatically adjusts itself to the needs of your SCSI bus and reports back any problems in the form of flashing LEDs. The heavily shielded Gold Cables also use LEDs to make diagnostic reports and are tipped with the same gold connectors featured on the Terminators. Plug 'em in and transmit with peace of mind.
Granite Digital; 510.471.6442; www.scsipro.com



What's Goin' On

News addicts take note: Global Village breaks the Internet ties that bind with **NewsCatcher**, a wireless desktop receiver that pulls news from the AirMedia Live information service and displays it on your PC, 24 hours a day. Like a news alarm clock, AirMedia's multimedia software alerts you when video and audio-enhanced content from the likes of Reuters, The Sports Network, Knight-Ridder, and Quote.Com is plucked from the airwaves. NewsCatcher retails for $149; AirMedia service packages range from $24.95 per year to $9.95 per month, depending on the level of service.
Global Village Communication; 408.523.1000; www.globalvillage.com

Hyper H_2O

Three more hours of heavy-duty C++ coding left and you feel about as productive as a wet sponge. The coffee in the office pot has taken on the consistency of tar. What to do? Toss back some **Water Joe**, the first caffeine-enhanced, artesian water ($1.25/half liter bottle). That's right—no heavy taste, no color, no sugar—just a cool refreshing rush without the syrup of a cola or teeth-staining aftertaste of coffee. Water Concepts suggests mixing their elixir with orange juice for a fruity morning pick-me-up, or even making coffee with the hyper H_2O for a double shot of caffeine.
Water Concepts; 312.654.8676; www.waterjoe.com

Is It Live or Is It Digital?

Sony's **DCR-PC7** HandyCam camcorder puts the crystal clarity of digital video into the palm of your hand. The $3,199 passport-size unit, weighing in at one pound (without tape or battery) records on the new Sony digital videocassettes. Desktop multimedia impresarios can edit digitally between two camcorders or output still images to a PC. No more squinting either—the DCR-PC7 sports both a viewfinder *and* a 2.5-inch SwivelScreen active-matrix color LCD screen so you can see what you've been missing. Add the Super SteadyShot image stabilization, and nausea-inducing shaky shots become a thing of the past.
Sony Electronics; 800.222.7669; www.sony.com

THE HIDEOUS SM

TO

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intel inside

pentium® PROCESSOR

ACK OF KNUCKLES TO JAW. THE GROTESQUE PING OF PIPE SKULL. THE REVOLTING SLICE OF SWORD THROUGH FLESH.

ALL DELIGHTFULLY EXPRESSED BY THE COMPAQ PRESARIO.

The Compaq Presario 8000 Series isn't for everyone. It's for that certain breed of multimedia enthusiast who likes a computer that, well, goes to 11. After all, the Presario 8000 Series is the most advanced multimedia home computer line ever made.

For starters, it features JBL Pro Premium speakers for the same awesome dynamics one enjoys from a home sound system. Rest assured, when combined with our Interwave 32-Voice Wavetable Synthesis for brilliant audio realism, it'll definitely rock your world. And quite possibly, your neighbors.'

Another cool feature is a Talk & Send 33.6Kbps modem. Not only does it give you the fastest Internet access,* it lets you play games and talk with your opponent at the same time. But perhaps most impressive of all, the Presario has PowerVR 3D Graphics and 6MB of graphics memory that bring true 3D arcade-quality images home for the first time ever. Translation: frightening realism and incredibly smooth animation.

The experience is further intensified by a range of cutting-edge power and performance features. There's even an innovative gamepad that puts everything in the palms of your hands. The same ones that are probably getting a little sweaty right now. For more information, visit us at www.compaq.com or call 1-800-345-1518.

The Compaq Presario 8000 Series. Not for the faint of heart.

COMPAQ

Has It Changed Your Life Yet?

Product Information Number 117

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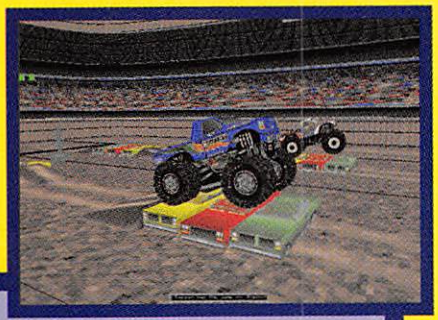

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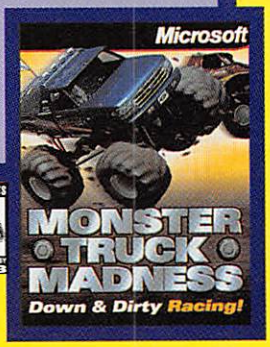

TRI

KIDS TO ADULTS
K-A
CONTENT RATED BY ESRB

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MEET MISTER MOSES

JAY COTTON WILL LEAD US TO THE MULTIPLAYER PROMISED LAND

Like many of us, Jay Cotton just wanted to play *Doom*.

Now he finds himself at the center of a full-fledged gaming revolution. He is a Moses leading gamers to the promised land of head-to-head gaming. A Che Guevara freeing them from the shackles of subscription gaming services. A Mao Tse-tung...

OK, OK. Enough crappy metaphors. The story:

A year ago, Cotton's work as a database programmer and network administrator at the University of Georgia (Athens) wasn't keeping him all that busy. So, he played some *Doom*. "I'd never played any action games until *Doom*," he recalls, "and I only played *Doom* because it was multiplayer." He and Scott Coleman (of Engage) wanted to play head-to-head, but they didn't share a LAN and didn't want huge phone bills for direct connect modem play.

Cotton and Coleman modified Jake Page's *Tcpsetup* and created *iDoom* (later called *iFrag*) for playing *Doom* over the Internet, releasing it as freeware. When *Descent* hit, they wanted to play *that* over the Internet, and realized the need for a generic IPX driver. They put *Kali* out as shareware with a $20 registration fee. "We hoped to sell about 300 copies to make it worth our time," he comments slyly.

Fifty thousand copies later (at twenty bucks a clip; do the math), Cotton quit his job, opened an office, and started working on it full time. And *Kali* is hot: about the hottest thing going in multiplayer gaming. Versions exist for DOS, Win95, Mac, and OS/2; and *Kali* servers are springing up all over the world to service a growing list of loyal users. What is this magical little program that bonds gamers?

Most people log onto their ISP accounts using a PPP connection. Like any modem, LAN, or direct connection, it works by turning information into bite-sized pieces of data code and shooting it down the wires. When a game is played over a LAN, its IPX pass these data packets back and forth. As Cotton says, *Kali* is "basically just an IPX driver. Games communicate with *Kali* just like they would with normal IPX drivers. The difference is that all data is sent in UDP packets instead of IPX."

Kali turns a global information network into your own personal LAN for gaming. Before, you had to pay for a dedicated gaming service, a long distance call, or have a LAN installed to play head to head; now a local phone call puts you in touch with real live gamers. Since, most ISPs offer unlimited hours for a flat monthly fee, you can now game online until you go blue and rot—all for no extra charge.

Simply log onto the Internet, and go to one of the many listed remote computers where people gather to play *Kali*. The program logs active servers, updating as needed, allowing you to chat, join existing games, and set up games on the fly.

But expect some speed bumps on *Kali*, as your data is bounced all over hell and back. That's called "latency" and that's where ping times and fast servers come into play.

First, you need the fastest connection possible. Your ISP must have a true T1 line and your connection must be true PPP: emulation doesn't cut it. Your speed is calculated by "ping" time—a sort of sonar that sends out a signal and clocks how fast that signal returns. *Kali* lists servers by ping time, filtering for high ping times, so you only get the fastest ping available at that moment. The lower the ping, the better the gameplay. Forget gaming at any ping greater than 300.

What affects ping? Numerous factors, from provider speed to line problems to modems that are simply too slow. The "hop" count—how many places the data jumps to before it reaches its source—is also key. This means that your provider may be next door, but if the signal goes to Guam before it gets where it belongs, your ping will be worse than a provider miles away with fewer hops.

Check each gamer's ping with *Kali* before starting a game, and ban those with slow ping. If a slow player is connected, he'll drag the whole game down. Once set up, you just start a game (the Win95 version automates this with icons) and start rockin'. At any moment you can find active games of *Warcraft 1* and *2*, *Apache*, *Command & Conquer*, *MissionForce: CyberStorm*, *Deadlock*, *Descent 1* and *2*, *Duke Nukem 3D*, *EF2000*, *MechWarrior 2*, *Mortal Kombat 3*, *Quake*, *Super Karts*, *Terminal Velocity*, *Top Gun*, *VR Pool*, and others going on at some *Kali* server, or you can start your own. Many are connected to dedicated servers that run competitions and keep play "ladders" to rank gamers. Web pages are springing up everywhere to track all this, and gamers are setting up their own servers—usually at their own expense.

Like most good inventions, *Kali* sprung from one person's need: the need for cheap multiplayer gaming for people separated by geography. "I never quite expected it to get this big," Cotton says. "We just got lucky that game after game was released that worked on *Kali* and soon we had tons of users to play against."

And all this success comes without a single ad being placed: it's all word of mouth. "If nothing else, I hope I make it so that Internet gaming will never be too expensive. I think I've already forced companies like TEN and MPlayer to rethink their ideas to charge by the hour. In the end, this type of competition will benefit the users. For now we just want to do everything better for more games: bigger, faster, better, easier, smoother. Beyond that it's impossible to guess. No one knows what direction this is going. I just want to be a part of it," says the unlikely messiah.

Viva la revolution.

"For now we just want to do everything better for more games: bigger, faster, better, easier, smoother." — *Jay Cotton*

T. LIAM MCDONALD is the all-knowing god of gaming. He also writes about computers, literature, and horror for numerous mags.

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Product Information Number 130

JAVA MAN SPEAKS

WHY IS JAVA **SO SLOW** AND WHY IS IT **SO UGLY**, TOO?

On Highway 1, just south of the Mexico border, I saw a sign for "Papas and Beer" (papas, meaning potatoes) and below the weathered sign's gigantic blue letters, I glimpsed **http://www.papasandbeer.com**. "I have a column due!" I shouted quite startled. My friend Tom Meyer, Director of Creative Engineering at First Virtual Holdings, posed the possibility: "Why not write it about the Web in Mexico?" *Papas and Beer Dot Com. No, Gracias.* But, the light bulb above my head went blink blink blink as I remembered that Tom was a Java expert, and there was probably more than enough techno-goop oozing from his brain to fill 20 columns, and we were facing headlong into another five hours on the road.

"Tell me why Java programs are so slow and why they look so bad."

And I learned...

Java is a platform-independent, object oriented programming language, and allegedly, Internet-ready. In its most basic form, Java is a tighter, cleaner version of C++. Like all object oriented programming, coding for Java involves deciding which "objects" you will need to accomplish the task in question, and what behaviors those objects will be able to accommodate. For example: If you have a piece of bread and you want to eat it, there are many different ways to go about this. You could toast it, or butter it, or throw it in the oven. You could throw it in the oven and butter it and put jelly on top. When building an application, a programmer needs to set these functions out clearly in the beginning. The natural tendency for programmers is to build a basic "class" with broad behaviors at first, and then add in more specific behaviors. The idea is that a class can "inherit" these behaviors from super classes (the more general forms of the object) so that each specific object doesn't require a huge piece of an ever-expanding collection of code. The more each object and its behavior set is well thought out and articulately specified, the more robust the application, and hypothetically this should make retrieving instructions easier for the computer.

This may all be good and true for standard object oriented programming, but Java's main medium is the Internet and programming for the Internet involves a very different paradigm. If your browser is running about the Web and finds a site that calls for a "toasted piece of French bread with cheese" class, your computer asks the host computer for the bread and downloads a piece of code that defines the bread. When your computer gets the bread it then has to ask the host computer for the part of the code that toasts it, and you wait a bit longer for the download. Then it has to go back to the host *again* to ask for the part of the code that adds the cheese, and yes, you'll have to wait for that piece to download too. Of course nothing else can happen on your computer while this is going on. So while you're waiting not-so-patiently for chunks of this simple Java applet to flow down your 28.8 pipe, you might wonder what's so great about Java anyway. Is it worth it?

While you're waiting not-so-patiently for chunks of this simple Java applet to flow down your 28.8 pipe, you might wonder what's so great about Java anyway.

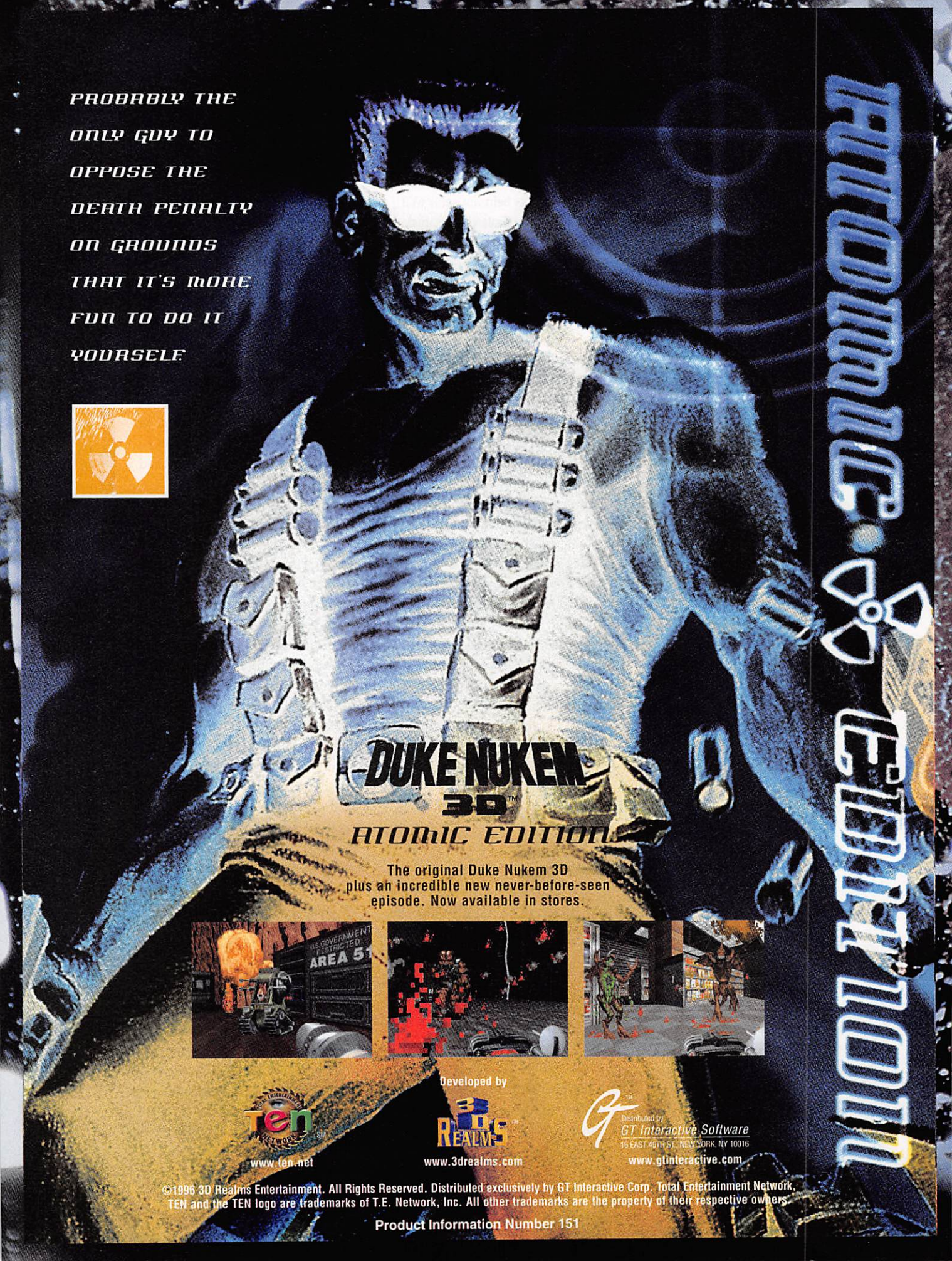
The fact is, it isn't the fault of Java, it's the fault of the programmers and the tools they use, which are accustomed to generating code for your hard drive, not for the Internet.

Programming for the Net means anticipating what specifics the users are really going to ask for, and build all of those properties into the class, instead of relying on generic class structures to "inherit" more properties. You'll have to program the whole "toasted bread with cheese" option instead of breaking it into byte-size chunks with the natural programming order. And while this may take longer for the programmer and the file sizes may be a bit larger, it also means the overall download time will be considerably smaller because users will be getting exactly what they need in the first download. This concept may seem strange to object oriented programmers, as it's more like old-fashioned procedural programming, but strangely enough it's better suited for applications used and viewed by Web surfers.

As for Java applets looking "bad" or demonstrating poor interface choices, there's an obvious, though oft-overlooked remedy. Few programmers can actually program high-functioning Java in these early days, despite the dozens of "Java Programming for the Lobotomized" books available. Considering how few Java-capable people there are, imagine how few of this elusive clan have *any* sort of training in interface design? Applets may not seem worth the cost of two(!) Java programmers, but think again. A good team will have at least one young, inspired hack for the heavy functionality coding and another, of equal but different skills, to guide interface design. Programmers proficient in both arenas are rare. And just as people have not-so-quickly learned that a Web site is rarely designed and created by just one person successfully, they'll also need to learn that a robust and useful Java application requires the same attention. Just because we're programming for the Internet doesn't mean we get to build ugly interfaces. And I stress: Cheap interfaces have less to do with the shortcomings of the Java language and everything to do with bad programming.

When we were (finally) home, I checked out the **www.papasandbeer.com** Web site but the DNS entry seemed to be missing... b

SHEL KIMEN (kimen@well.com) has spent more time online than is reasonably healthy for one person and dreams in hypertext.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Product Information Number 151

VICTIMS OF STUFFGLUT

NEW TECHNOLOGIES TO NAVIGATE YOUR GIGABYTES

It's not called a "hard disk" for nothing. As hard disks get bigger and bigger, it's getting harder and harder to find the stuff you need and get rid of the stuff you don't. Sure, you can attack the problem the anal-retentive way: Dutifully organize your files into Byzantine hierarchies of nested folders within folders within folders. But that carries you only so far when gigabytes start multiplying like rabbits.

Some people call this problem "infoglut." A better term might be "stuffglut." Lots of stuff on your hard disk isn't really information... it's just stuff. README files you'll never read. Shareware you downloaded, used once, then forgot. DLLs and EXEs from old applications that cling to your PC like binary barnacles. In other words, the drek of the Information Age.

This isn't one of those hints-and-tips articles telling you how to clean up your hard disk. You already know about uninstall software and utilities that launch search-and-destroy missions against useless DLLs. The point of this column is that those stopgap measures won't be enough as your mass storage keeps growing. For example, my PC has 5,500 files in 238 folders, and that's on a measly 1GB hard drive that's only half full. And before long, even newbies will have 2GB and 4GB drives filling up on their desktops. And DVD-ROMs will store up to 17GB... per disc! Finding the stuff we do need is becoming the real problem.

Windows searches for files by name, but not by content. Some programs can search files for content, but full-text searches on large archives are abysmally slow. And what if the information is hiding on a removable disk cartridge, or a network server, or even 10,000 miles away on the Internet?

Obviously traditional file systems aren't keeping up. What we need is a whole new approach.

Windows NT Server 4.0 supports a new module known as the Microsoft Index Server (code-named "Tripoli"). Basically, the Index Server does for hard disks what Web crawlers such as Alta Vista do for the Internet. It sifts through all of your files, grammatically analyzes the textual content, and builds an inverted-tree word index, which is about 10 percent the size of the content.

When you need stuff, the Index Server can locate it much faster than a brute-force keyword search because it examines the index, not the files.

When you need stuff, the Index Server can locate it much faster than a brute-force keyword search because it examines the index, not the files; and it automatically indexes all publicly exposed drives on a LAN, which widens the range of your searches.

Microsoft didn't make the Index Server available until the beta-2 release of NT Server 4.0, so it's still evolving. The current version points you to files that contain your keywords; the next version will point to words within the files themselves. Also, the current version can't follow links to files that someone moved or deleted; it must rebuild the index at regular intervals.

Microsoft plans to build similar technology into the regular versions of Windows. It's easy to use because the query form is just an HTML page, which can be viewed in any Web browser. That means anyone familiar with HTML can design a query form that's as simple, or as powerful, as they want. Advanced users can frame requests with Boolean operators and proximity ranges to retrieve very specific information. (To find out more, see www.microsoft.com/NTServer/Search/.)

Of course, you can still browse manually through your files and folders if you want. But soon you'll have accumulated thousands of folders and tens of thousands of files. Over time, you'll have to rely more often on search tools to find what you need.

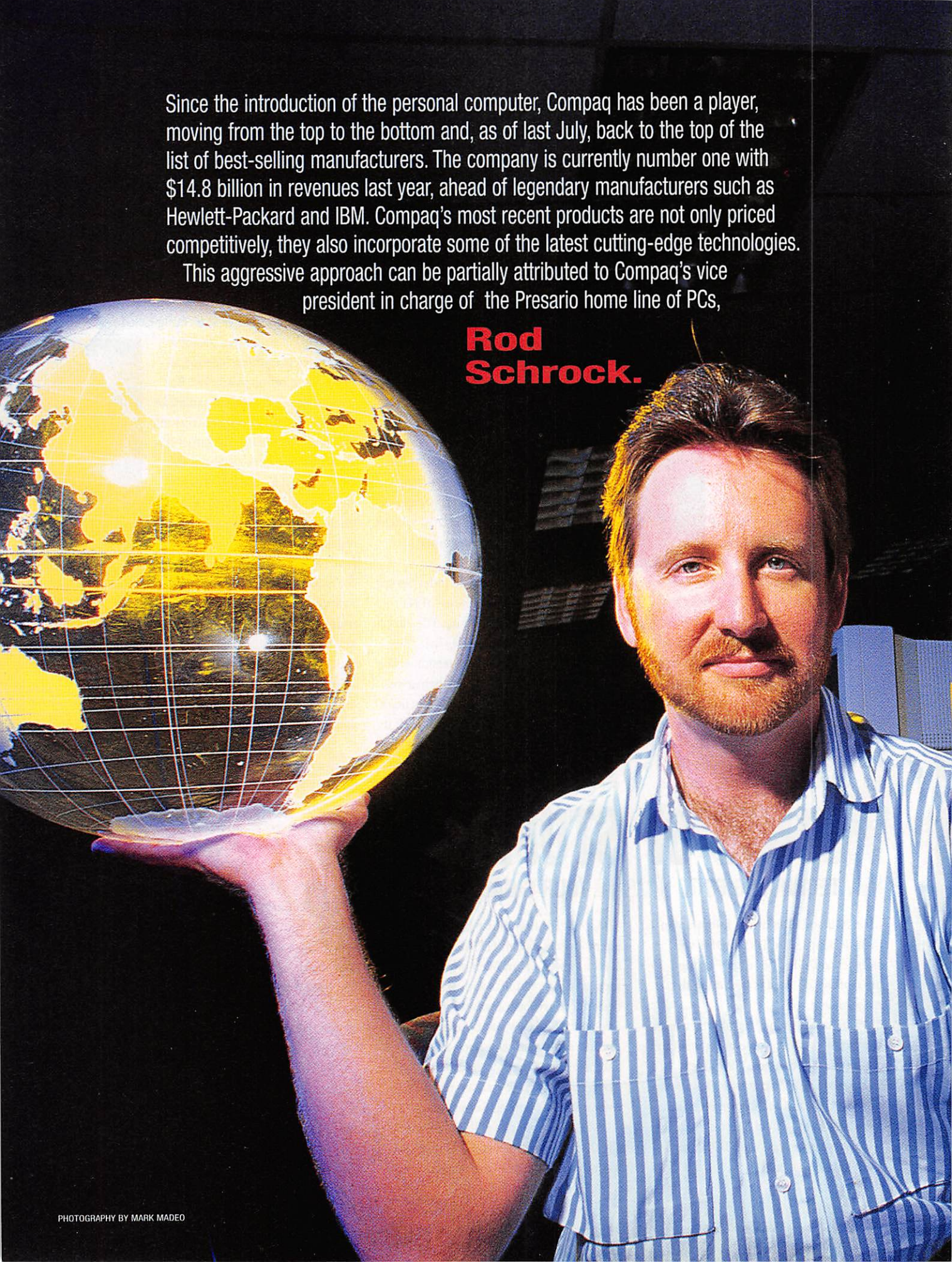
Eventually, the entire file system—not just the search tools—may radically change. For one possibility, consider Apple's Newton OS. No matter what else you think of the Newton, it takes an extremely interesting approach to mass storage. It discards the conventional file-and-folder organization in favor of something called the "soup": a structured database that stores everything together as objects in a common archive. For convenience, the Newton can make the soup appear as if it contains regular files, but it's not the same. It's more like one huge database file.

Microsoft has already taken a step in this direction with OLE structured storage. This is a method of organizing compound documents (such as a Word document that contains links to Excel tables and PaintBrush graphics) by creating the near-equivalent of a file system within a file. In effect, a structured file contains its own hierarchy of data objects and subdirectories, and the subdirectories may contain additional objects and subdirectories.

OLE structured storage might appear more complicated, but not if a query interface lets you search for objects inside the compound files. That's where Microsoft is going. For example, let's say you're looking for a table linked to a Word document, but you can't remember the name of the document. A simple filename search won't help. Even a full-text keyword search of your Word files won't find the table if it's a linked object, because the data you're looking for isn't really part of the Word document. What you need is a search engine that can explore linked objects, just as a Web crawler can follow hypertext links to related Web pages.

Watch for this technology to appear piecemeal with each new release of Windows and Windows NT. You may not use it at first, but as with all new technologies, someday you'll wonder how you got along without it.

TOM HALFHILL is a senior editor at *Byte* magazine and the author of two computing books. He first became interested in computers during the disco era.



Since the introduction of the personal computer, Compaq has been a player, moving from the top to the bottom and, as of last July, back to the top of the list of best-selling manufacturers. The company is currently number one with $14.8 billion in revenues last year, ahead of legendary manufacturers such as Hewlett-Packard and IBM. Compaq's most recent products are not only priced competitively, they also incorporate some of the latest cutting-edge technologies.

This aggressive approach can be partially attributed to Compaq's vice president in charge of the Presario home line of PCs,

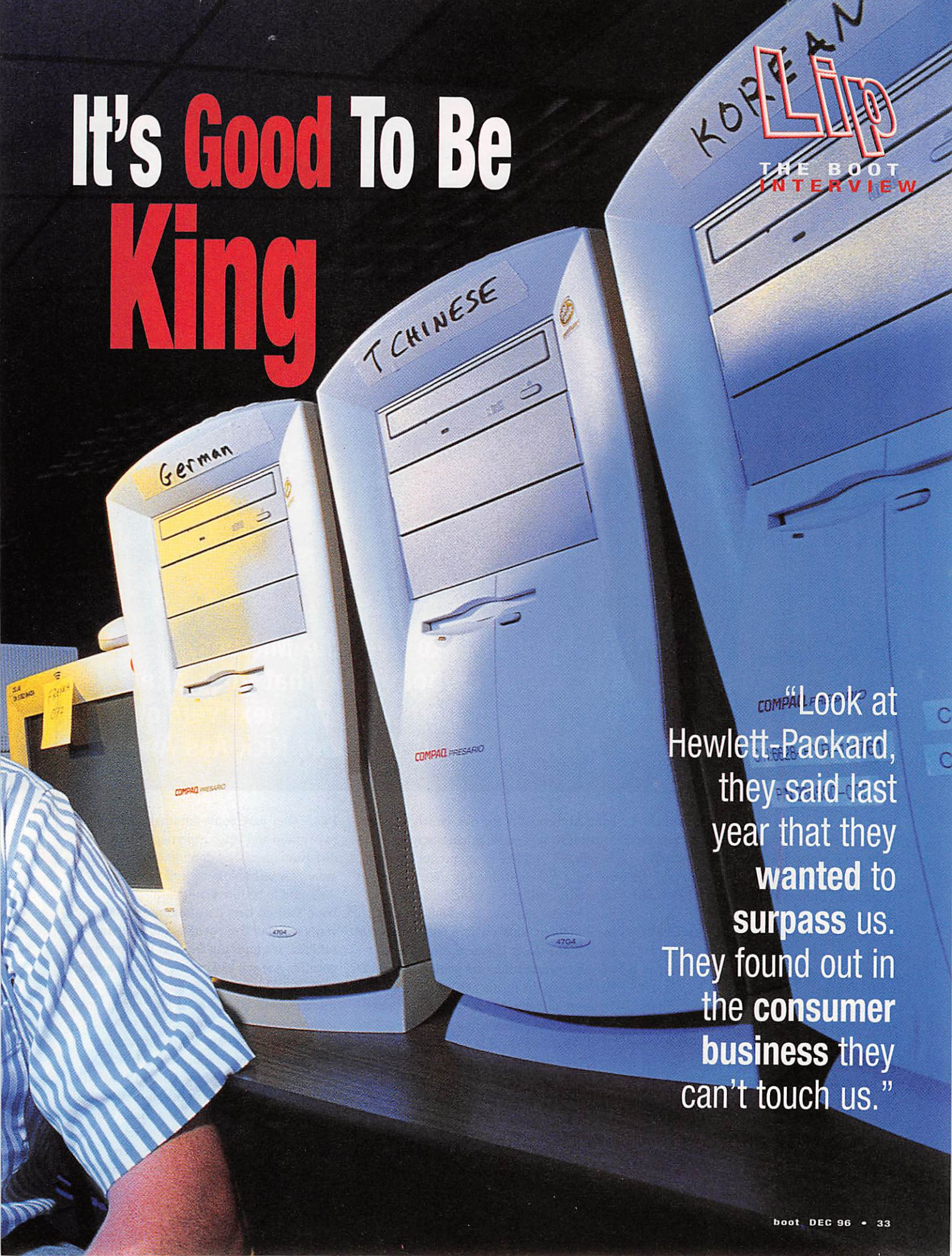
Rod Schrock.

PHOTOGRAPHY BY MARK MADEO

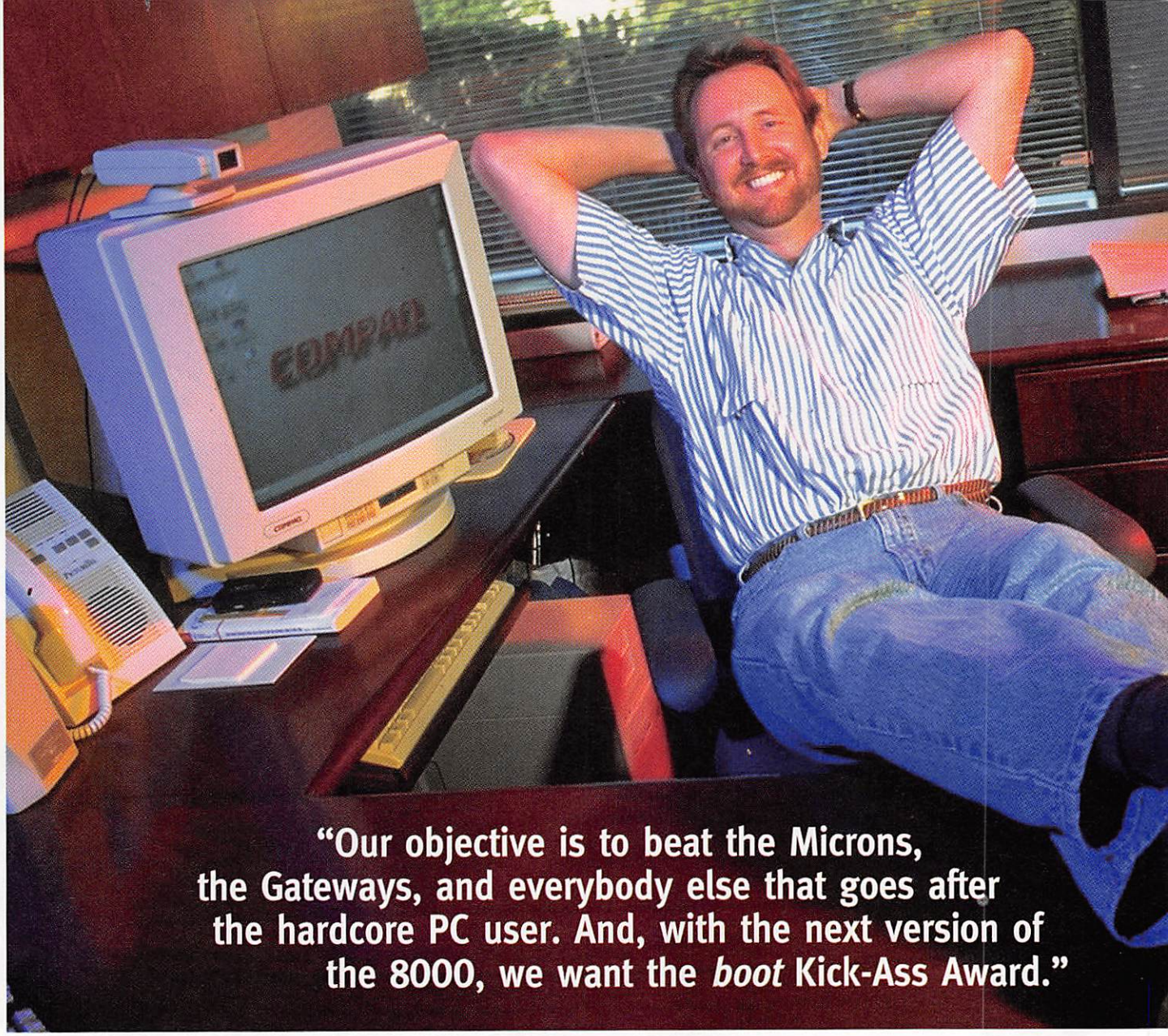
It's Good To Be King

Lip

THE BOOT INTERVIEW



"Look at Hewlett-Packard, they said last year that they **wanted** to **surpass** us. They found out in the **consumer business** they can't touch us."



"Our objective is to beat the Microns, the Gateways, and everybody else that goes after the hardcore PC user. And, with the next version of the 8000, we want the *boot* Kick-Ass Award."

boot: Two years ago, Compaq was held in the same regard as Packard Bell, a manufacturer with aggressive pricing but dubious product. Now Packard Bell has fallen off the radar and Compaq is number one. How did that come about?

SCHROCK: From an aggressive and really passionate product development group. I come from the early '80's days of Compaq when we used to make the best PCs in the market... bar none. And that's the current mindset. It's great to make innovative consumer products. We organized about 15 months ago and we really targeted the consumer market. And that's when it took off. We said we want the very best products we can get for the second half of '96, coming out in June and July. And this is the result. It's the work of a very excited, motivated, and focused team.

boot: At the end of the day, which is more important: aggressive pricing or quality?

SCHROCK: I'd like to say product quality, but price plays a strong role. We have really innovative products, products that do something special and have an emotional attachment to them. That's what's really important.

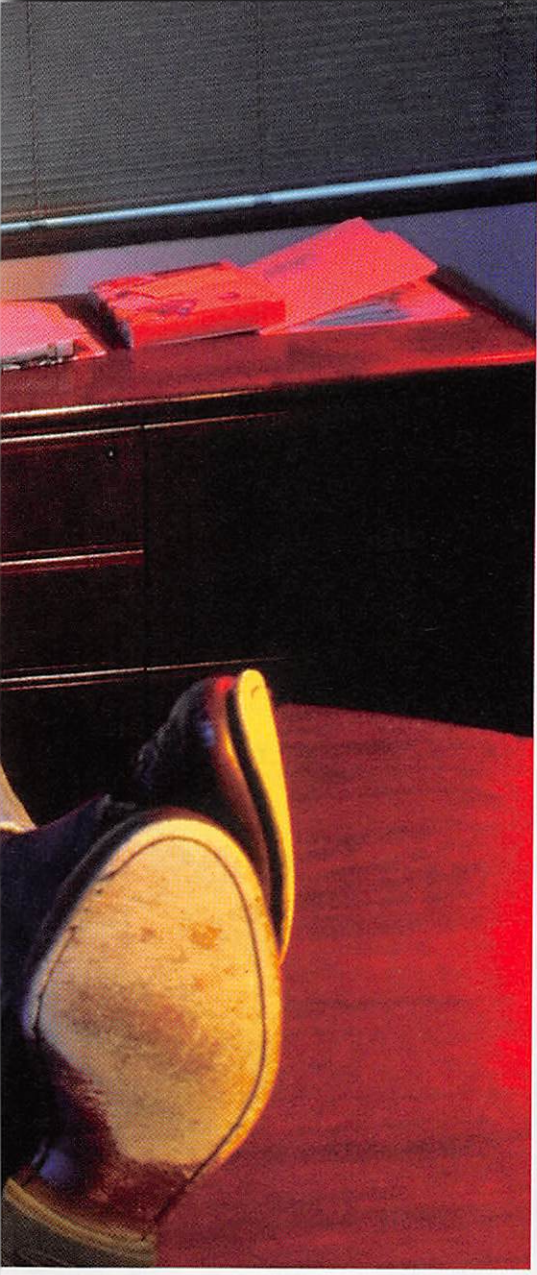
boot: Some major Japanese consumer electronics manufacturers are getting into the PC business. In the media, it's been called "The Japanese Invasion." How would you categorize these companies' entry into the market?

SCHROCK: I'd say that's a fair characterization. They will be formidable competitors. And they have to be, because the number-one-selling consumer electronics product category is PCs. If I were them, I'd be looking at this and saying, "If I am going to be a consumer electronics provider in the next millennium I've got to be in on consumer PCs." They have some advantages: They have audio and video expertise. They have disadvantages: They don't know how to integrate new technology as well as we do. So it's going to be interesting.

boot: Toshiba says it's gunning for Gateway's number five position and Sony has said that it's gunning for your number one position. Are you looking over your shoulder?

SCHROCK: [Laughs] Toshiba has set a more realistic objective. As long as current management teams are in place, we've got the moment. We have a broader product line. We have much more talent in R&D. And we're not stumbling. Look at Hewlett-Packard, they said last year that they wanted to surpass us. They found out in the consumer business they can't touch us.

boot: Many American companies have traditionally regarded the home consumer



channel as a ghetto where inferior products are dumped. How do you approach a new consumer line versus a new commercial line?
SCHROCK: Today, I think that statement is true in reverse. The consumer has moved to the leading edge. They aren't the dumping ground anymore. They want the innovative product. They have more demanding system integration in terms of hardware and software. They drive the OS's harder than any other users. The multimedia nature of the software and the expectation of the multimedia consumer are part of it. There's a big difference between you laying down your $2,000 or $3,000 for a new system versus a company allocating a budget of $20,000 for 10 systems. You're going to be a much more discriminating buyer and you're going to want to protect your investment by getting the very best you can. We have a saying that if you can make it in the consumer market, you can make it anywhere.

boot: What is Compaq's commitment to the *boot* reader—the hardcore user—other than the solitary product that is the 8000 series?
SCHROCK: It's my commitment. And it's consistent with the overall Compaq history. We were the first to deliver a 386 computer when the entire industry said, "You can't do that." That's my heritage in the PC industry; so we have a lot of good engineers who understand the latest in technology. And we want to give them [the engineers] a segment of the market with the 8000 series. We have to make this the best multimedia experience available. And I think they [the engineers] are 90 percent of the way there. Our objective is to beat the Microns, the Gateways, and everybody else that goes after the hardcore PC user. And, with the next version of the 8000, we want the *boot* Kick-Ass Award.

boot: The Compaq 8710 uses NEC's PowerVR as one of its dual 3D accelerators. Did you regret using the Power VR chip when you found out NEC was not going to use it in their own ultimate game machine?
SCHROCK: The reason they're not [using the Power VR chip] is because NEC Electronics made the decision to support Compaq. It was a unique relationship. I think NEC plans to use [the Power VR chip] in their next line of systems. It was a time-to-market advantage that caused NEC's PC company to not be able to use [the Power VR chip] in the same time frame we were. I don't feel like it was an incorrect decision because long term, when you really architect gameplay, you get the best experience and superior performance.

boot: Is 3D acceleration destined to become a standard feature on all PCs, or just at the high end?
SCHROCK: We offer varying levels of 3D acceleration. And I think long term it's going to be standard because not only do you get more realistic gaming experiences, but with VRML and the things that are happening on the Internet, you're going to see interactive 3D Web pages—and that's a much richer way to experience the Net. It's also part of the consumer expectation—that lifelike realism—either watching TV or interacting with their PC. The more we offer that, the more excited they are about buying the product.

boot: When do you expect to see 3D acceleration in all of your product line?
SCHROCK: My guess is the middle of next year.

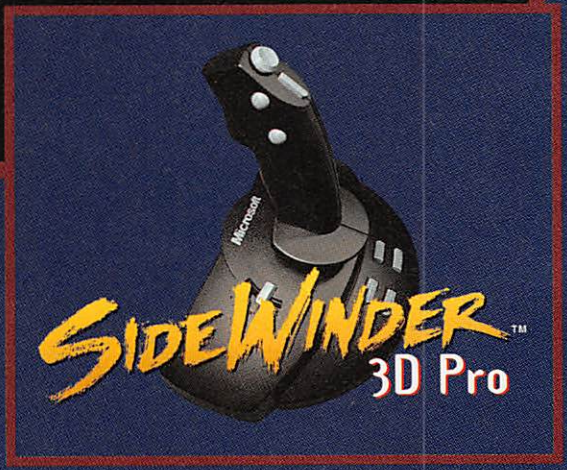
boot: You went to the trouble of having Harmon International design custom speakers for the 8000; only to then drive them with an inferior sound card with limited Sound Blaster compatibility. Is audio quality a secondary concern?
SCHROCK: No. We probably have different perspectives on it. We selected the Interwave for its audio performance. Quite frankly, we didn't put enough emphasis on the Sound Blaster compatibility. In the product that's shipping, the Sound Blaster compatibility is done in software emulation. There's no getting around that. It's not a hardware-compatible Sound Blaster card. That was a mistake on our part. The reality is the audio performance, clarity, harmonic distortion, the experience you get with the JBL speakers—it's the best. When we made the decision, it was the middle of last year. The game developers we worked with, along with Microsoft, said—and we had the over-optimistic belief—that they were going to move their games to Windows 95 and run under ActiveX. We kind of got ahead of the curve on that one.

"The **consumer** has moved to the **leading edge**. They aren't the dumping ground anymore. They want the **innovative** product. They have more demanding **system integration** in terms of **hardware** and software. They drive the **OS's** harder than any other users."

The reason

lightning doesn't strike twice
in the same place
is that the same place isn't there
the second time.

— Willie Tyler



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Microsoft

Where do you want to go today? www.microsoft.com/sidewinder/

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boot: What is the single most important technology on the horizon?

SCHROCK: I'd have to say the technology with the most appeal is something that hasn't been talked about too much yet, and that's the in-home network. Our strategy is to design into our PCs, by 1998, in-home wireless networking. That will let you bring all that media-rich content in over the Net, or however, and distribute it throughout the home. It will enable the digital home. We won't have a bunch of isolated boxes anymore.

boot: Mr. Gates' simple PC and Mr. Ellison's NC: Are they the future or a fad?

SCHROCK: We're going to speak with our products, and those will probably come out next year. Me? I don't see the big need for an Internet-only box. *boot*'s target readers and our target customers don't buy PCs for only one purpose. And the speed of accessing the Internet is not there yet. And the content is not rich enough yet. Maybe in a couple of years it will be worthwhile. What we see is something you can use to surf the Internet and run Windows 95 games.

boot: Does Microsoft hold too much control over the computer industry? Does Compaq ever bend to pressure from Microsoft?

SCHROCK: Microsoft holds a very strong role in the industry. They want to make sure they are a long-term player. Have they ever forced us to make decisions? Nothing significant. We're good partners with them. We'd like to follow them as much as we can. The Compaq-Microsoft relationship goes way back. We partnered with them and Intel to help break the IBM dominance.

boot: If you could change the course of PC history what would you change?

SCHROCK: Oh man, that's tough [Laughs]. I would have ensured that there was a more open landscape so that Intel and Microsoft had more competition. They are great companies. But it would be a healthier industry if there was more competition.

boot: Do you believe the computer market has peaked and sales will decrease in the coming years?

SCHROCK: It's still growing. We had a good back-to-school season, which is a good indicator for what will happen at Christmas. There are a set of people that have to have cutting-edge PCs. But there are also markets, mostly outside the U.S., where PCs haven't become a requirement. We expect growth to continue.

boot: The average consumer, when they go into a CompUSA or similar store, may never see your latest products until they are almost obsolete. Is this a problem for Compaq?

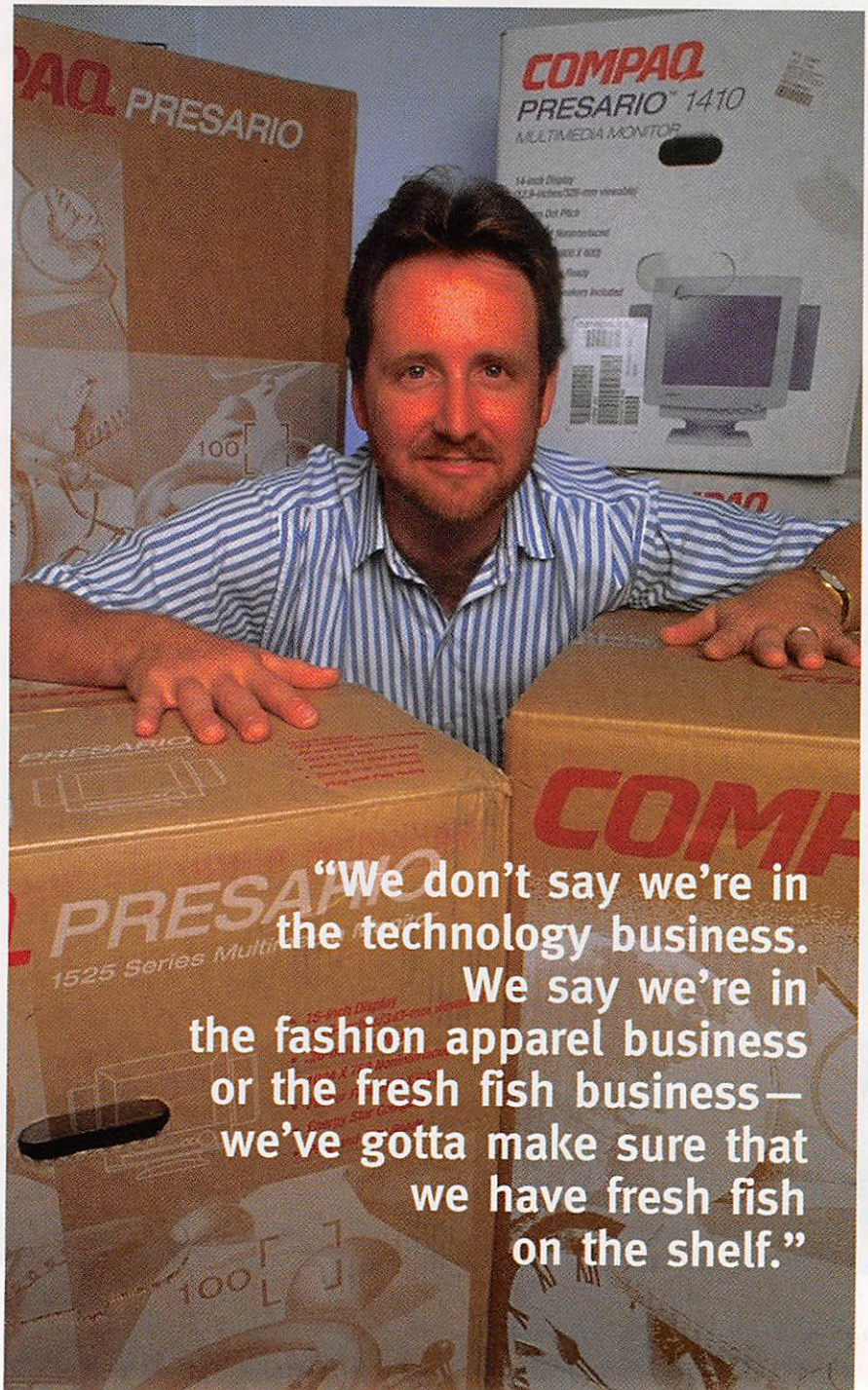
SCHROCK: For the first time, we have retailers taking down names for back orders, which is unheard of in our business. But to your point, product refreshes are so fast—every six months. And retailers still have old stuff on the floor. It may take a while for them to mark it down and move it off the floor for the new product. It's an issue. We don't say we're in the technology business. We say we're in the fashion apparel business or the fresh fish business—we've gotta make sure that we have fresh fish on the shelf.

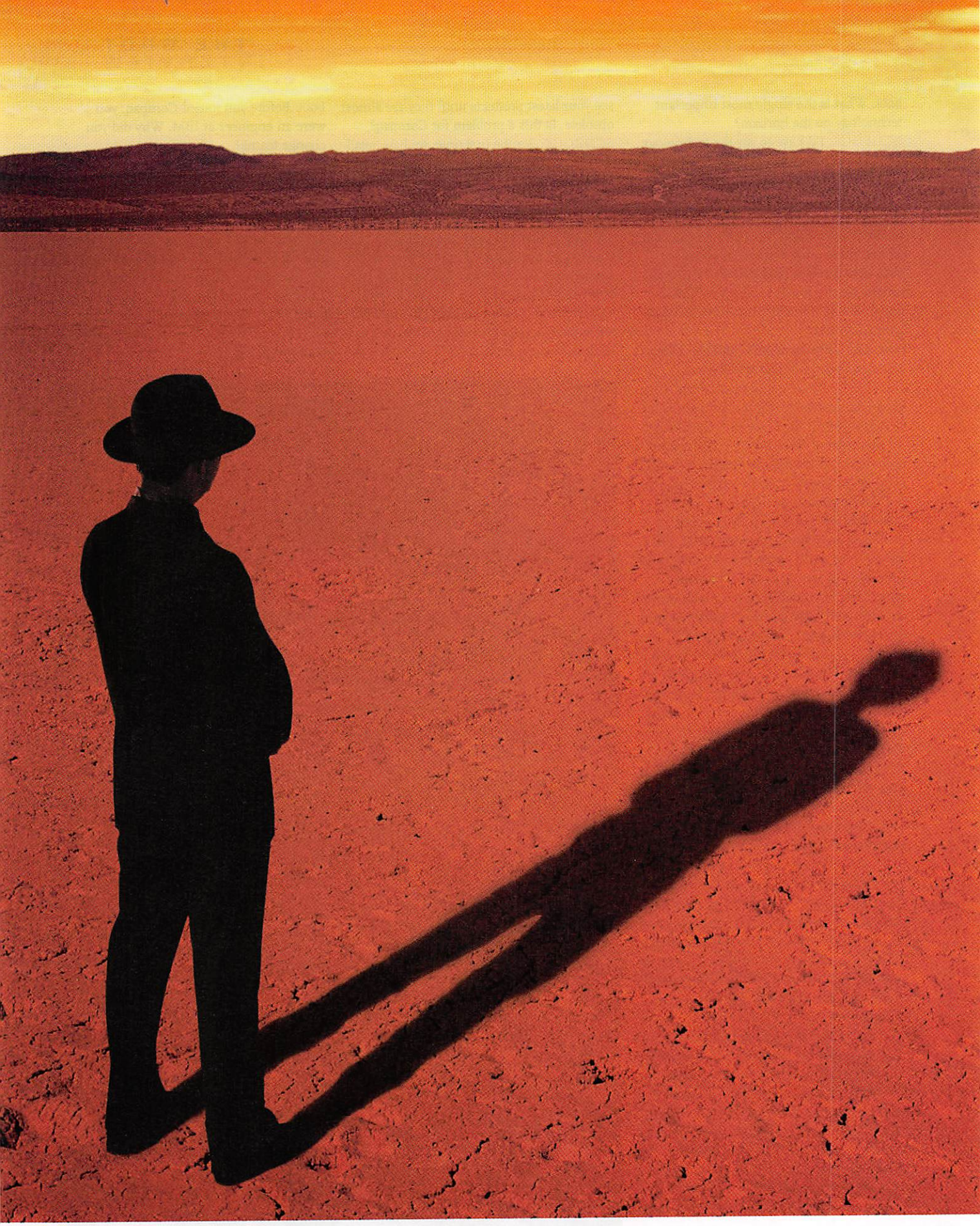
boot: Before you joined Compaq, you were an engineer at IBM. Why did you change teams?

SCHROCK: I actually went back to school [Harvard] and got my MBA. But around that same time, I went to ComputerLand to buy a PC. I intended to buy an IBM but the salesman moved me into a Compaq portable and I fell in love with it. IBM is too close to the mainframe business and I think there are more exciting things going on elsewhere.

boot: What do you want for Christmas?

SCHROCK: The Presario 3020. I love that product.





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Mac OS

Designed for Microsoft Windows 95

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Meet **New** and **Fascinating** People
From All **Around** the **Globe**;
and **Kill** Them.

WorldWide War

The Next Level In **Multiplayer Gaming** Can Be Found **Online**. And It's a **Blast!**

BY BERNARD YEE

You've beaten the machine. You've dominated the office LAN. Where can the ultimate warrior find a challenge? Enter the Internet. Hundreds of thousands of hardcore gamers gather daily online to square off in computer competition, and the numbers are only growing. Nevermind how sophisticated any game's AI may be; it'll never equal the spontaneous creative strategy of some kid in Poughkepsie. And when you meet up with the ultimate game master from Flint, Michigan... well, you'll learn the meaning of humility.

But still, the Internet's a big place, and how exactly are any two little gamers supposed to find one another for their slice of martial bliss? And exactly what technology's going to be involved? Fear not. While you can make your gaming connections in the flesh of the real world, you can also hook up with a proprietary service such as CompuServe or AOL; or log into an Internet gaming service such as DWANGO or TEN; or find a company, such as Blizzard or Activision that sponsors gamers going online with their titles; or scout out one of the hundreds of Kali servers that dish up head-to-head action; or even a small private Web page. It's all good. And it's all happening.

Dawn of a New Era

The days of the proprietary network are fading fast. The Internet and the World Wide Web are here to stay—for better or worse. While the Internet's mass accessibility and the Web's point-and-click friendliness have spawned enormous growth in their popularity, the Net's open architecture may not be such good news for online gamers.

But before we get to the games and the services that love them, there are two terms you'll absolutely need to know and understand, and grow to hate: bandwidth and latency.

Bandwidth is the holy grail of online access—the amount of data that can be shoved through the lines into and out of your computer. Most people are stuck with POTS (or Plain Old Telephone Service), running a 28.8Kbps modem. A handful of gamers use the new 33.6Kbps modems and there are initiatives to introduce 50+Kbps modems, but that won't happen until well into 1997. An ISDN line delivers about 128Kbps, depending on your computer's serial port speed. A T1 line—reserved for commercial use because of the cost—is a veritable speed demon at 1Mbps. While higher data throughput is always good, it's more of a concern for services providing video, audio, and other data-intensive services over the Internet. But it isn't a big concern for online gamers since the amount of data needed for an online game is minimal. In *Quake*, all you need is your position, your heading, your velocity, and weapons fire; everything else is handled at the client end, on your computer.

In **Quake**, all you need is your **position**, your **heading**, your **velocity**, and **weapons** fire; everything else is handled at the **client** end, on your **computer**.

The holy grail for online gaming is **latency**, which measures the time that it takes data to leave your computer and for a response to come back. So if you fire a rocket launcher, and it takes one-third of a second to reach your enemy's computer, it's possible your enemy would have moved in that time. The longer the latency, the longer the lag time between the time you pull the trigger and the time the rocket leaves the launcher. Latency gets added all over the place—your modem adds up to 100ms (especially with compression/error correction), before your data even hits the Internet. Remember, the Internet was designed to survive a nuclear attack—meaning there are many data paths for your message to get from one place to another. A direct, coast-to-coast call has about 24ms of latency. On the Internet, your data packet can encounter up to six routers en route to its destination, and each piece of hardware your data encounters can add 10ms of latency.

Obviously, the less latency the better; humans can detect a latency as low as 30ms, but it's generally acknowledged that a 250ms latency or better is necessary to play twitch games such as *Quake* or *Duke Nukem 3D*. Driving games require an even lower latency than twitch games, and are still not realistically playable over the Internet. The solutions proposed by some commercial gaming networks are temporary at best, claiming latency is best when you access the service through specific ISPs. But wait! Isn't that basically saying you need to be on one network? Smells like proprietary access in sheep's clothing.

The fact is: latency is here, and it's here to stay. Get used to it, and get used to performance fluctuations depending on Net traffic. All those low latency claims made by the online game services are partially true, partially marketing hype. The only folks who can realistically lower your latency on a consistent basis are the guys who manage the big pipelines: Sprint, PSINet, MCI, and AT&T to name a few. When the network is upgraded, at a cost of billions of dollars, latency will be lowered.

The Players

Total Entertainment Network, commonly known as TEN (www.ten.net) grabbed the early attention, attracting more than 25,000 registered users during its free beta period. TEN went out and spent its venture capital freely, prompting rumors of financial woes.

PHOTOGRAPHY: JUDE EDGINTON ELECTRONIC MANIPULATION: L. MORRIS

Where did TEN spend its money, you ask? "Exclusive" licenses for games such as *Duke Nukem 3D*. Did that pay off? Well, more about that later.

TEN has an array of connection options. You can use your own Internet TCP/IP access, but this can be frustrating—even with an ISDN connection on an external Motorola BitSURFR Pro, clocking 112Kbps throughput, logging on at nine in the morning, connections rated OK... then deteriorated. Of course, you can use Concentric Network to access TEN, which should lower latency, but for diehard Netizens, changing your ISP is about as convenient as changing your phone number. TEN costs $30 per month for unlimited access (add another $20 for unlimited Net access through Concentric), or $7.50 per month for six hours, and $1.25 per hour thereafter.

The only **folks** who can realistically **lower** your latency on a **consistent** basis are the guys who **manage** the big pipelines: **Sprint**, **PSINet**, **MCI**, and **AT&T**.

Mpath (www.mpath.com) is the one to watch. With less hype, and fewer users than TEN, Mplayer (Mpath's service) is poised for a strong second wind. Mpath is backed by companies such as SegaSoft (which has provided money and is developing content), and Mpath's strategic acquisition of Catapult's console-based X-Band service gives it experience with managing, billing, maintenance, and customer service from an online gaming network that actually was in full commercial operation—and access to X-Band's 60,000 subscribers.

Mpath recommends using PSINet as an ISP, but unlike TEN, doesn't offer dial-up only access—you have to be on PSINet. (Residential users now access PSINet through Mindspring, www.mindspring.com, the ISP that purchased PSINet and Pipeline's consumer base.) For $2 per hour, you can play *MechWarrior 2*, *Quake*, and *Terminal Velocity* on Mpath, but the pool of competitors is smaller here than on TEN.

Play *Doom*, *Duke Nukem 3D*, *MechWarrior 2* on the **Dial-up Wide Area Network Gaming Operation** (DWANGO). Sharp-eyed readers will notice that *Duke Nukem 3D* is an "exclusive" on TEN. That's because *Duke* isn't here by the good graces of Apogee. Instead, DWANGO wrote drivers that utilize *Duke*'s IPX LAN connectivity and translate it to DWANGO's service. They're not running *Duke* code, so a charge of piracy isn't really relevant. And DWANGO's paying royalties to Apogee anyway.

This maverick mentality characterizes DWANGO's approach. Its action games are not playable over the Internet—in fact, you can't even play against someone across the country yet. DWANGO's servers are located in certain cities across the country, with new servers opening in Asia. The irony is that while this goes against the popular wisdom of "proprietary networks are dead," which is true for general online needs, DWANGO's proprietary network ($7.95 per month; 10 hours for $19; 40 hours for $59) provides greater performance and lower latency than any Internet connection.

If it sounds like it's TEN vs. Mpath, with DWANGO looking to crash the party, it isn't. But others have a stiff battle ahead. **ImagiNation Network** has been trapped in its own roots for a long time—created by Sierra and only stocked with Sierra games such as *Red Baron* and *Front Page Sports: Football*, the service looks dated and threadbare. AOL now owns INN, but given AOL's technical difficulties, they may be in over their heads trying to manage a games service. INN does plan to roll out a 3D lobby environment called CyberPark, and it has actual experience running an online game service—a priceless commodity in the days ahead. Meanwhile, **MPGNet**—a small online gaming service with a standout *Kingdom of Drakkar* RPG game—came close to becoming one with a certain rapidly-Internet-oriented software giant in Redmond, but the deal fell through. Too bad. MPGNet could have used Bill's money to finance some glitzy twitch titles to attract more users. MPGNet is moving to Internet access too, and its low pricing (the first

The Ten Best Multiplayer Games of All Time

Doom

You're not surprised, are you? *Doom*, born of John Romero's nightmares, clinched landmark status when John Carmack, id's reclusive programmer, told Romero that he could get multiplayer network play in. "I knew then it would be the best game in the world," says Romero. Deathmatch—a frenzied free-for-all over the network, became a raging addiction. Sure, you can play cooperatively... but why?

Falcon 3.0

Spectrum HoloByte's F-16 flight simulator set the standards for the genre of modern air-combat sims. But Gilman Louie envisioned an Electronic Battlefield feature, where the game could be played over a LAN with different players in the air and on the ground. Network cooperative play means you can fly missions in a campaign with a real, live wingman. With *Falcon 4.0*, Louie's Electronic Battlefield may come to pass.

Multiplayer BattleTech

One of the all-time great computer games was the original *MechWarrior* from Activision, the EGA game that introduced computer users to BattleMechs: 80 ton robots from FASA's *BattleTech* universe. Kesmai took the game's engine and rewrote everything else, introducing Multiplayer *BattleTech* on GEnie. Though the game never left beta testing, and was scrapped for Kesmai's SVGA version of *BattleTech: Solaris*, *Multiplayer BattleTech* lets you fight together with human lancemates, or go head-to-head in the *Solaris* gameworld—a MechWarrior's dream come true.

Quake

Duke Nukem 3D stole some of *Quake*'s thunder, and in some ways the *Duke* is superior to *Quake*. But *Quake*'s 3D engine is stunning: smooth, detailed, and impressive; the environment is creepy; and the game truly shines in multiplayer mode. 3D means you can climb on ramps above your opponents, and polygon characters (rather than sprites) mean that things look real... bloody. And you can play it over the Internet for free (other than your ISP fee) via a TCP/IP connection, or any of the online gaming services.

MechWarrior 2: Mercenaries

Activision's *MechWarrior 2: Mercenaries* is a great game in need of a bug patch, (which is on the way). More than 50 Inner Sphere and Clan Mechs, from the Assassin to the Zeus, most of the *BattleTech* weapons, and a souped-up texture-mapped engine means that *Mercenaries* is a *BattleTech* fan's dream. But Activision's MercNet allows Internet play through a PPP connection via your ISP. Configuration is painless, and when you connect to Activision's server, you'll meet plenty of MechWarriors looking for action. And,

Tom Clancy SSN

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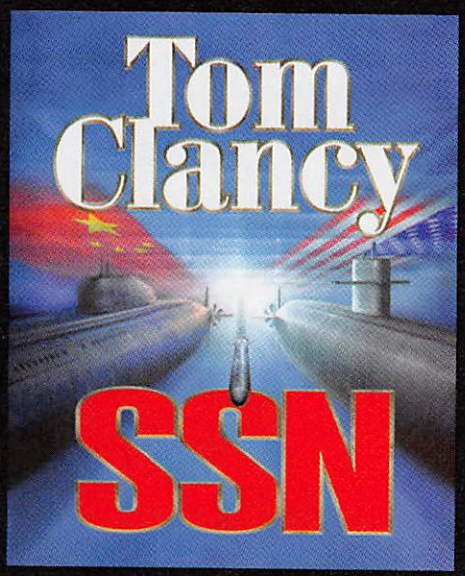

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Product Information Number 301

month of the service costs $4.95) is easy to swallow. Each month after that is an all-you-can-eat price of $9.95 per month—a rate that's sure to attract more subscribers.

Finally, Interplay's **Engage** sounds promising, though the service isn't running yet. Interplay spun off Engage with the hope of avoiding INN's Sierra-only limitations, but the jury is still out over whether Engage—or the new INN—has succeeded. While Engage has an impressive lineup of Interplay games, such as *Descent Online*, the AD&D's RPG *Descent to Undermountain*, and broad-appeal games such as the Vegas-inspired *Caesar's World*; it has yet to announce a major third party title. But Engage will be available for free on AOL and Prodigy, and possibly other online services too. And since they haven't used a wide public beta testing period, Engage appears to be behind competitors Mpath and TEN.

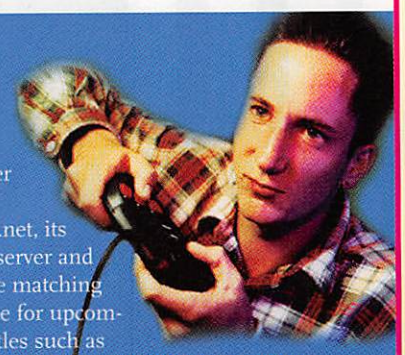
Only a few of the online gaming services are actually in full commercial operation. Neither TEN nor Mpath's Mplayer are in full rollout. In fact, right now you can play for free on both TEN and Mpath.

DWANGO is charging, but it's not in full commercial mode either. And the few veterans in this business are trying to reinvent themselves.

The first casualty of the online gaming wars was **GEnie**, frag'd by poor interface, lousy connectivity options, and anemic Internet access. GEnie once ruled the online gaming world with some of the best online games, such as *Air Warrior* and *Multiplayer BattleTech*. But its most loyal subscribers—gamers—left for AOL and CompuServe.

The Future

There are two trends emerging now. First, game companies realize that it's no problem to provide Internet support: *Quake* can easily be played over the Internet through your TCP/IP connection, which may put the *Kali* folks (*Kali* drivers allow LAN games to be played over the Internet) out of business. Activision's *MechWarrior 2: Mercenaries* comes with Internet support built in, and all you need to do is point your browser to Activision's Web site (www.activision.com) to find folks willing to play. Blizzard goes one step further with battle.net, its Web server and online matching service for upcoming titles such as *Diablo* and *Starcraft*. What does all this mean? It means that for the most popular network games, you won't need TEN or Mpath to play on the Internet. Of course, you lose the user interface and lobby features of these online game services, as well as the latency-boost if you're on the recommended ISP. The online services will need to provide support not only for the latest network/retail games—a tiring proposition—but they'll have to work on bringing us multiplayer-only games.



The problem with games such as *Quake* and *Duke* are that they are designed to be network games played over a LAN. Even games with built-in Internet support, such as *MechWarrior 2: Mercenaries* rarely do anything more than use the Internet as a LAN. These game titles will bring users to the Net, but it's innovative new games such as *Ultima Online* and *Meridian 59* that will make them stay. The future is in persistent, massively multiplayer environment games designed for online-only play. Log off, and the world stays alive, and even manages itself. Massively multiplayer means that more than the eight or 16 network clients can play at once. TEN offers something like this with its *Darksun Online*, but that RPG engine is sadly outclassed by Origin's upcoming *Ultima Online* and 3DO's *Meridian 59*. *Meridian 59* is a first-person fantasy RPG that is played over the Internet, and it's been called a 3D graphical MUD. Knowing that chat is the most popular function of services such as AOL, a graphical venue to chat and play together should be one of the most popular online games. *Meridian 59* is out now, but the game to watch is *Ultima Online*, bringing Lord British's world to cyberspace, without the namby-pamby morality, in a world bigger than all the *Ultimas* combined.

Message to the game companies and the online services of the world: We're here, waiting for someone to build it. And when it's compelling enough and fun enough, we will come. b

other than your ISP fee, MercNet play is free.

Air Warrior

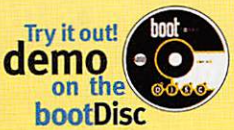
Kesmai rules the virtual skies with the greatest multiplayer World War II fighter game—though challengers such as *Confirmed Kill* and *Warbirds* are lining up their sights on the champion. *Air Warrior* has all the aspects of the massively multiplayer, persistent environment. But newbies will be hunted down like baby lambs by the experienced squadrons of pilots that hang out here.

Gemstone III

Simutronics's seminal RPG hearkens back to the days of the *Great Underground Empire*—in ASCII. *Gemstone III*, a text-only game, has been responsible for monthly bills as high as $1,000 for many a gamer, and like an interesting city, has been built up over the years. The text interface may discourage those young 'uns used to point-and-click, but it offers more depth than any graphical online offering to date.

Neverwinter Nights

Don't misunderstand me—*Neverwinter Nights*' game engine, from SSI's 8-bit Gold Box AD&D role-playing game series is so old that you're more likely to find webs on the game than the game on the Web. And you probably wouldn't want to play it today. But it is *Advanced Dungeons & Dragons*, brought to AOL in a massively multiplayer environment. Dozens, if not hundreds of gamers came online, not just adventuring together but creating guilds and societies, and even inventing a way to circumvent the game's prohibition on player vs. player combat.



Duke Nukem 3D

It's a ray-traced, "2 1/2 D" game, but *Duke Nukem 3D* is full of extraordinary design details. If you can stand the sexism, you'll have the joy of playing a game that seems to be designed for deathmatches. A variety of weapons and locations—and the ability to interact with the environment—means the action's fast and furious. You can even create traps for your LAN victims; but you can't play it over the Internet without going through TEN or DWANGO.

WarCraft II

Show up at the Imagine Publishing offices early just about any Saturday morning and littered among the empty beer bottles and janitorial staff trying vainly to sanitize the place, you'll find a surprisingly large cotillion of diehard humans and Orcs, cursing each other as they battle through the breakfast hours for hard-earned turf. This LAN mine is coming online at a service near you.

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Waldren "Frog" Joseph as photographed by Lee Crum.

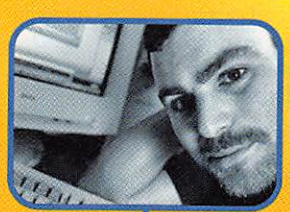
Who **needs** another **comprehensive** list of 2,006 **crappy** 14-inch monitors? **Who** has time for a complete **rundown** of weak 133MHz **systems**. **boot's** about just the **best**. Who wants any **less**? Every month we're **bombarded** with a pile of **product**, and we scout out the **rare breakthrough goods** to present our readers with **"the short list,"** the handful of **systems**, **software**, and **peripherals** worth **considering** when it comes time to **buy**.

Lust

the sexiest gear of the year

List

At the end of the year, 10 boot editors and contributors manage to narrow the field down to the 10 items that crossed their desks this year that really fired their imaginations. These 100 tech tools and toys make up the 1996 Lust List.



PHOTOGRAPHY: MARK MADEO

Brad Dosland

Editor in Chief

Brad Dosland helms the mighty *boot* ship as it navigates the ever-changing currents of the PC seas. He's a consummate gadget freak with a weakness for tech toys; and an avid basketball fan/player (bad knees allowing).

iomega Jaz Drive

Zip drives are great. But at 100MB, they're too small. Heck, 200MB is often too small for the job. That's when you need the 1GB of a Jaz drive with a handy cartridge that goes to work, to the studio, the service bureau, and back home again.

PRICE: $499
COMPANY: iomega
PHONE: 800.697.8833
URL: www.iomega.com

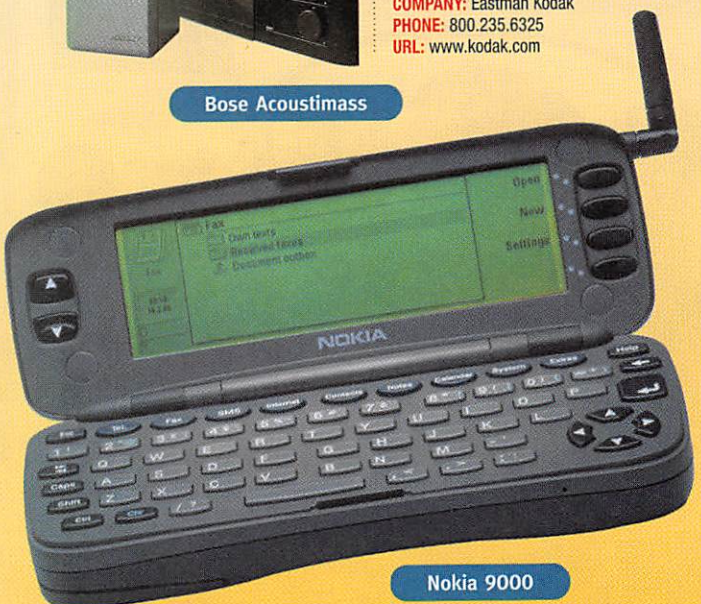
iomega Jaz Drive

Kodak DC20

OK, OK... So it's not the most powerful digital camera in terms of resolution or memory, but it's smaller than my wallet and always in my pocket when I need it. The difference between getting the shot or not makes it the digital camera I want.

PRICE: $349
COMPANY: Eastman Kodak
PHONE: 800.235.6325
URL: www.kodak.com

Bose Acoustimass



Nokia 9000

Bose Acoustimass

I don't want to spend all day staring at the flashing LEDs on a pair of three-foot tall tower speakers flanking my monitor. I just want the best sound around with minimal clutter in my shoehorned computer cubby, and that's what Bose delivers.

PRICE: $699
COMPANY: Bose
PHONE: 800.444.2673
URL: www.musicwest.com/-sponsors/bose/bose.html

Nokia 9000

If you've gotta carry both a cell phone and a PDA (and who shouldn't?), why chew up two pockets when one will do fine. With the quality and power of Nokia behind it, this dual-function wonder is a no-compromise proposition.

PRICE: $3,000
COMPANY: Nokia
PHONE: 800.666.5553
URL: www.nokia.com

Duke Nukem 3D

Come get some of the best shoot-'em up yet. Sure *Quake*'s technically more impressive, but it doesn't have the soul, smut, or sense of humor that grace the more creative levels in our old friend *Duke*.

PRICE: $39.95
COMPANY: 3D Realms
PHONE: 800.337.3256
URL: www.3drealms.com

Tomb Raider

You could sit around and wait to watch the next Indiana Jones movie, or you could fire up *Tomb Raider* and play a cinematic adventure right now. With big, bold 3D and silky smooth gameplay, it's a no-brainer choice.

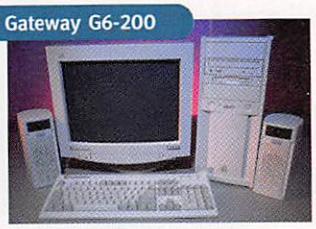
PRICE: TBA
COMPANY: Eidos
PHONE: 415.693.0297
URL: www.domark.com

Nokia 21-inch Multigraph

Sure there are better speakers than the ones built into the Multigraph; and better subwoofers than the built-in one; and better Net cameras. But this is still an excellent 21-inch monitor, and the fact that all other stuff is built in just makes it better.

PRICE: TBA
COMPANY: Nokia
PHONE: 800.296.6542
URL: www.nokia.com

Gateway G6-200



Gateway G6-200

When you talk about cranking the power out of your pure 32-bit monster apps, you're talking about a dual-booting Pentium Pro system; and when you talk about the ultimate P-Pro hardware, look no further than the G6-200: 200MHZ CPU, 32MB RAM, 2GB Ultra SCSI-2 hard drive, Matrox MGA Millenium onboard, and expansive room to grow into.

PRICE: $4,599
COMPANY: Gateway 2000
PHONE: 800.200.0629
URL: www.gw2k.com

Windows NT 4.0

Looks like friendly old Win95, but it's smooth as butter. Microsoft's "other" OS is the essential link in the P-Pro/*3D Studio Max* chain that will lead to creative salvation.

PRICE: $319
COMPANY: Microsoft
PHONE: 800.426.9400
URL: www.msn.com

3D Studio Max

Creating and rendering 3D models is the PC's ultimate means of capturing human imagination. But imagination is a dynamic and fluid affair, requiring the speed and open-ended versatility of *3D Studio Max* for the PC to keep up with the human mind.

PRICE: $3,495
COMPANY: Kinetix
PHONE: 415.507.5000
URL: www.ktx.com

MICHAEL BROWN

Reviews Editor

Reviews Editor **Michael Brown** is a former musician, so he can't understand why so many games sound so bad. Cool stuff has been flooding the bootLab lately and he really is as tired as he looks. But it's a *good* tired.

Creative Labs AWE32 PnP

Someday there will be PCI sound cards that will lead us out of the Stone Age of PC digital audio. In the meantime, we have the AWE32 PnP. This card's onboard EMU8000 wavetable synth sounds fantastic, and you can add up to 28MB of memory for creating custom samples.

PRICE: $249.95
COMPANY: Creative Labs
PHONE: 800.998.1000
URL: www.creativelabs.com

NEC PowerPlayer 2020

With a 200MHz Pentium, 256K pipeline burst cache, 32MB EDO DRAM, 3Dfx Voodoo Graphics *and* S3 ViRGE 3D-graphics accelerators, 6MB video memory, 6x CD-changer, Advanced Gravis GrIP MultiPort hub with two gamepads, awesome Advent speakers, ThrustMaster Flight Control joystick... This machine has gaming power oozing out of its ventilation slots.

PRICE: $3,299
COMPANY: NEC Technologies
PHONE: 800.632.4636
URL: www.nec.com

Sony DSC-F1

There's a bumper crop of great digital cameras this season, but this is my favorite. From its

Sony DSC-F1

IrDA-compliant infrared transceiver to its pivoting viewfinder/lens, the DSC-F1 is packed with innovative features. The camera's three different levels of JPEG compression all result in pix with 640x480 resolution.

PRICE: $849.99
COMPANY: Sony Electronics
PHONE: 800.352.7669
URL: www.sony.com/

Nimantics NX-Lite 133 and NX Home Base docking station

I'm willing to forgo a CD-ROM drive to get a lightweight notebook, but I can't do without an internal floppy and I won't give up performance. Nimantics answers my wish list with this 133MHz box, which is thinner than most notebooks even when installed in its docking station.

PRICE: $2,995; docking station $595
COMPANY: Nimantics
PHONE: 800.646.5005
URL: www.nimantics.com

HyperBlade

This futuristic game offers speed, action, killer graphics, and multiplayer support. A cross between street hockey and hand-to-hand combat, *HyperBlade* is the sports game for people who don't like sports.

PRICE: $39.95
COMPANY: Activision
PHONE: 800.477.3650
URL: www.activision.com

6. Alps MD-4000

You have $700 to spend. Which do you buy, a good color scanner for your Web page, or a great color printer for all those other projects. Alps Electric's MD-4000 delivers both in the same device. The printer is capable of 16 million colors at 600x600 dpi (1200x600 in grayscale), and the single-pass 24-bit scanner boasts optical resolution of 600dpi. There's nothing else like it.

PRICE: $699
COMPANY: Alps Electric
PHONE: 800.825.2577
URL: www.alpsusa.com

Global Village NewsCatcher

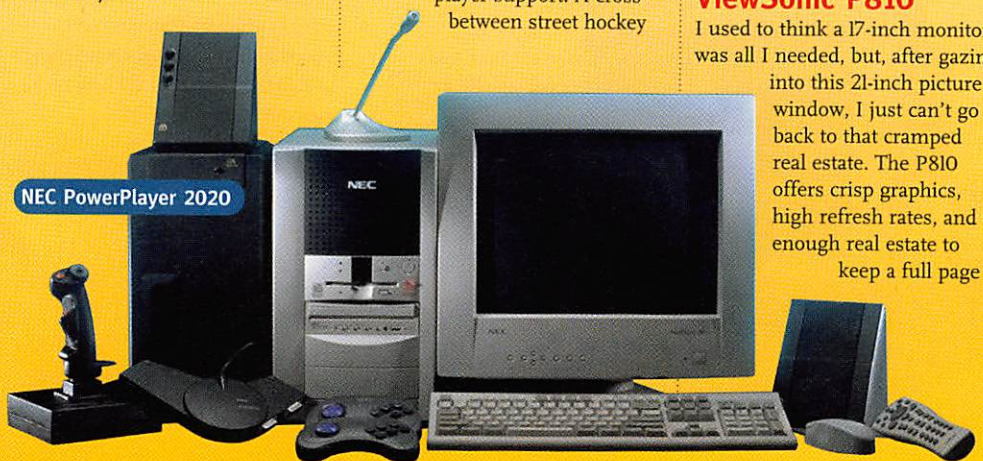
The PointCast Network is fine if you're riding somebody's T1 line, but the pyramid-shaped NewsCatcher grabs headlines, sports scores, and other information out of thin air. If you want more in-depth information, click a button and it launches your browser and takes you directly to the relevant site. Cool stuff.

PRICE: Hardware: $149 Service: $9.95/mo
COMPANY: Global Village
PHONE: 408.523.1000
URL: www.globalvillage.com

ViewSonic P810

I used to think a 17-inch monitor was all I needed, but, after gazing into this 21-inch picture window, I just can't go back to that cramped real estate. The P810 offers crisp graphics, high refresh rates, and enough real estate to keep a full page document *and* a full-size Web page in front of me at all times.

PRICE: $1,845
COMPANY: ViewSonic
PHONE: 800.888.8583
URL: www.viewsonic.com



NEC PowerPlayer 2020

SCM MicroSystems SwapBox Classic SBI-D1

Infrared is good, but I still like a solid hardware connection for transferring data between devices. The SwapBox transfers files from AT-compatible flash memory cards, plus it allows you to use any PCMCIA peripheral on your desktop machine. It's inexpensive, useful, and cool.

PRICE: $119.95
COMPANY: SCM MicroSystems
PHONE: 408.370.4888
URL: www.scmmicro.com

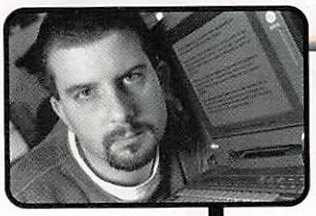
Cambridge SoundWorks MicroWorks

Ahhhh. Where do I begin to describe these awesome speakers. With a 66-watt amp tucked into the massive subwoofer, these babies pack a wallop whether you're playing an intense game or listening to Wagner. Not recommended for apartment dwellers unless your neighbors are deaf—or you are the landlord.

PRICE: $349
COMPANY: Cambridge SoundWorks
PHONE: 800.367.4434
URL: www.hifi.com

Bryan Del Rizzo

Tech Editor



Bryan Del Rizzo hails from the frigid Canadian tundra, and is now indentured to *boot* magazine as Technical Editor. Aside from hockey, curling, ice fishing, caribou hunting, and igloo building, Bryan likes to build sculptures using a rare combination of snow, ice, green Jell-O, and Coke slushies.

Sony KP-61XBR48

Polywell P-200 System

Triple Play '97

Electronic Arts' *Triple Play '97* is clearly the best baseball simulation for the PC, and its the perfect solution to weathering the chilly winter months preceding spring training. Plus, it features the entire MLBPA team members and stats from the 1995 season.

PRICE: $59.95
COMPANY: Electronic Arts
PHONE: 800.245.4525
URL: www.ea.com

FAA Chicken Gun

The FAA has a device for testing the strength of windshields on airplanes. They point this gun at the windshield of an aircraft and shoot out a dead chicken at about the speed the aircraft normally flies. If the windshield doesn't break, it's likely to survive a real collision with a bird during flight. 'Nuff said.

PRICE: N/A
COMPANY: FAA
PHONE: N/A
URL: www.cyberair.com/tower/faa

Sega Saturn with NetLink

Forget *Mario*—the Sega Saturn has the coolest game library of all the console platforms; and with its NetLink feature, you can use your Saturn to surf the Web or compete against other Sega or PC players. Throw in a Sega Saturn game library, and you won't see me until 1998.

PRICE: $399
COMPANY: Sega
PHONE: 800.733.7288
URL: www.sega.com

56.0Kbps Modem

28.8Kbps bandwidth just isn't powerful enough anymore, so a new modem using Rockwell's new high-speed modem technology would be a welcome hardware addition.

PRICE: TBA
COMPANY: Rockwell Semiconductor
PHONE: 800.854.8099
URL: www.rockwell.com

Polywell P-200

Since the bootLab has spoiled me for more powerful equipment, I'd like to ring in the new year with a P-200 system including a Cyrix 6x86 166MHz chipset, 32MB of EDO DRAM, Orchid Righteous 3D video card, and a 4MB Matrox MGA Millenium 2D card.

PRICE: $2,770
COMPANY: Polywell Computers
PHONE: 800.999.1278
URL: www.polywell.com

Bose Acoustimass

Play games the way they were meant to be heard—through a reindeer-thumping, 50-watt subwoofer and satellite speakers so small that they get lost in my desk clutter.

PRICE: $699
COMPANY: Bose
PHONE: 800.444.2673
URL: www.musicwest.com/sponsors/bose

Sony KP-61XBR48 61-inch Television

Sure they're big, but let's face it: Projection screens just don't cut it with their fuzzy display and dim picture. The Sony XBR line's fantastic picture quality would be a welcome addition to my home-theater setup, especialy with the Twin View 2-Tuner Picture-in-Picture capability.

PRICE: $5,499
COMPANY: Sony
PHONE: 941.768.7669
URL: www.sony.com

U.S. Robotics Pilot 5000

Its versatile handwriting recognition actually works, making it cool to use, and its pack-of-cards dimensions makes it handy to transport everywhere. I don't care if everyone else at *boot* wants one of these pocket miracles; I want mine and our Editor in Chief hordes the only evaluation unit U.S.R. sent us.

PRICE: $369
COMPANY: U.S. Robotics
PHONE: 800.881.7265
URL: www.usr.com

Blade Runner

A snippet of *Blade Runner* was shown at this year's E3 show, and it looked absolutely awesome. But since then, the game has been kept under extremely tight security. If Santa's covert ops elves can sneak into Westwood Studios' Las Vegas office and procure this good little boy an "advance" copy, I'll definitely leave milk and cookies out for the big guy.

PRICE: TBA
COMPANY: Westwood Studios
PHONE: 800.874.4607
URL: www.westwood.com

Warcraft III

We can only wish.

PRICE: N/A
COMPANY: Blizzard Entertainment
PHONE: 800.953.7669
URL: www.blizard.com

Chris Dunphy

Tech Editor

Technical Editor **Chris Dunphy** is a computer science and engineering grad. He is also a passionate advocate of alternative operating systems, short pants and vests in the bootLab, and other funky stuff.

BeBox Dual603-133

I already have the 66MHz BeBox, but I'd love to trade up to twice the speed. The BeBox is the ultimate computer toy: elegant and beautiful to muck around with. I want to turn mine into the world's largest universal remote control. Best of all, the BeBox has "Intel Outside" and it doesn't do Windows.

PRICE: $2,995 loaded
COMPANY: Be
PHONE: 415.462.4100
URL: www.be.com

BeBox Dual 603-133

Rutan Boomerang

When the greatest aeronautical engineer since the Wright brothers builds his dream plane, you know it'll be awesome. Burt Rutan's Boomerang doesn't look like anything before it, and it's the first plane to use a notebook to control and monitor all flight operations. Though there's little chance the Boomerang will be available anytime soon, the instrumentation and computer control hardware/software may

Rutan Boomerang

be available to kit aircraft builders sometime next year.

PRICE: one of a kind
COMPANY: Rutan Aircraft Factory
PHONE: 805.824.2645

U.S. Robotics Pilot 5000

I need to get organized, and my paperware Franklin is just too low tech. Plus, I need something I can carry with me everywhere without noticing I have it, and something that can stay synched with my files online. Nothing does this better or smaller than the Pilot PDA. I need one, yesterday.

PRICE: $369
COMPANY: U.S. Robotics
PHONE: 415.949.9560
URL: www.usr.com

Gateway Destination

You Don't Know Jack is fun on a desktop PC's small screen with a few close friends. But it's an over-the-top blast to play on the Destination's giant screen with a dozen friends partying in your living room. I'm not expecting a desktop replacement; I just want to play the big PC games on my very own big-screen TV in my tiny living room.

PRICE: $3,299
+ $699 for bundled Pro-Logic audio system
COMPANY: Gateway 2000
PHONE: 888.200.0629
URL: www.gw2k.com

Ricochet Wireless Modem

Taking the Net with you on the road helps blur the boundaries between cyberspace and reality. A Ricochet and a notebook are the first step to being the technomad I've always dreamed of becoming. Next, I need a HUD headband and a palm keyboard. I wonder if the Borg have any job openings...

PRICE: $40 per month
(rental plus basic service)
COMPANY: Metricom
PHONE: 800.556.6123
URL: www.metricom.com

Acernote Nuovo/150

I nearly put the Nimantics Orion 166 on my Lust List, until I had to put up with its limited battery life. Now I think I've found a notebook with both power and stickability. Despite its powerful 150MHz Pentium processor and a 128-bit accelerated 11.8-inch active-matrix screen, Acer's Nuovo is rated for more than six hours of battery life.

PRICE: $4,599
COMPANY: Acer America
PHONE: 800.733.2237
URL: www.acer.com/aac

Ultima Online and Subscription

I'm an Ultima lover, and though *Ultima IX* is still a year away, while waiting I'd love to get some hang time in a Britannia full of other real adventurers. The scope of *Ultima Online* looks tremendous, and things will never get dull with a whole living world to explore.

PRICE: TBA
COMPANY: Origin Systems
PHONE: 800.245.4525
URL: www.owo.com

Nintendo 64

I'd hoped to list the new 3DO M2 here, but latest word is that even the Japanese release will be delayed until next year. The Nintendo 64 is cool, but I hate the way Nintendo stifles outside developers and limits its content. But until the M2's ready, I'm sure Mario can keep me busy.

PRICE: $249
COMPANY: Nintendo
PHONE: 800.255.3700
URL: www.nintendo.com

Gateway G6-180

I'd like to have a heavy-duty machine to go home to every night, satisfying my Unix withdrawals. The P-Pro powered G6-180, dual booting between NT and Linux, would be just the ticket for my home server. And what's a server without a dedicated 24x7 ISDN connection to the Internet? My fingers are crossed that I'll wake up Xmas morning to a smiling PacBell installer at my door.

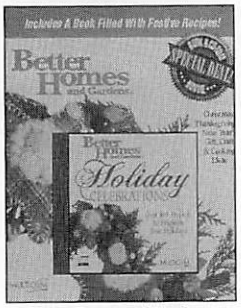
PRICE: $2,859
(save $490 by ditching the monitor)
COMPANY: Gateway 2000
PHONE: 888.200.0629
URL: www.gw2k.com

Sound Blaster AWE32 PnP

I was raised on Amiga hardware, so I'm used to machines having great audio capabilities straight out of the box. I really want to cry when I hear an otherwise awesome PC start belting out tinny FM synth crap. The AWE32 is the best widely-supported piece of quality audio hardware out now.

PRICE: $225
COMPANY: Creative Labs
PHONE: 800.998.5227
URL: www.creativelabs.com

Gateway Destination



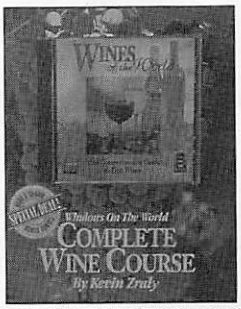
Better Homes and Gardens Holiday Celebrations
Multicom Publishing

Holiday Celebrations *contains more than 100 recipes, crafts, decorating tips, sewing projects and gift ideas.*

[PC: WIN 3.1 or WIN 95; 486; 8mb]
[MAC: Sys 7.1; 68030; 8mb]
Hybrid: works on PC and MAC systems

Vendor Price: $39.95

Borders Price: $19.95



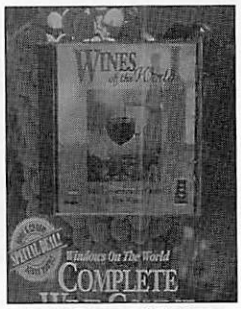
Wines of the World & Windows on the World Complete Wine Course
Multicom Publishing

The combination of Kevin Zraly's highly praised book and Multicom's award-winning CD provide everything you need to become an expert in wine appreciation.

[PC: WIN 3.1 or WIN 95; 486; 8mb]
[MAC: Sys 7.1; 68030; 8mb]
Hybrid: works on PC and MAC systems

Vendor Price: $49.95

Borders Price: $42.95



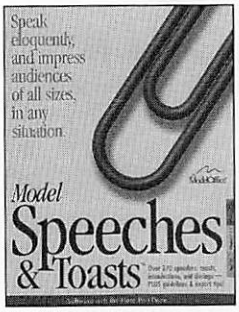
Better Homes and Gardens Decorating Your Home
Multicom Publishing

Add creative flair and designer finish to your home using the three-dimensional CAD feature to plan your space and experiment with different textures and patterns.

[PC: WIN 3.1 or WIN 95; 486; 8mb]
[MAC: Sys 7.1; 68030; 8mb]
Hybrid: works on PC and MAC systems

Vendor Price: $49.95

Borders Price: $34.95



Model Speeches & Toasts
ModelOffice

Seasoned speakers and first-time presenters alike will benefit from this storehouse of 270 speeches, toasts, introductions, openers, closers and quips.

[PC: WIN 3.1 or WIN 95; 386; 8mb]
[MAC: Sys 7.0; 68020; 4mb]
Hybrid: works on PC and MAC systems

Vendor Price: $39.95

Borders Price: $29.95

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This holiday, explore our wide selection of CD-ROM educational and reference titles.

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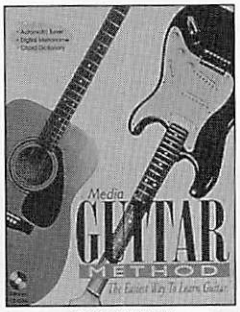


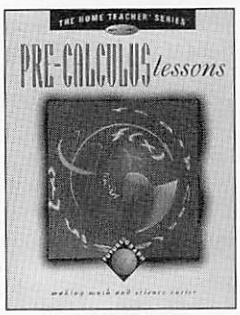
Guitar Method
eMedia

This comprehensive tutorial contains 60 lessons illustrated by more than 30 videos and three hours of audio; recorder, automatic tuner and metronome included.

[PC: WIN 3.1; 386; 2mb]

Vendor Price: $89.95

Borders Price: $69.95



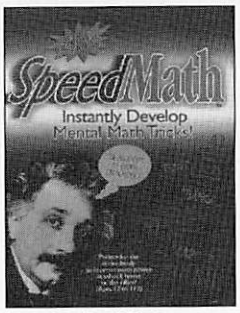
Pre-Calculus Lessons
Future Graph

This unique home-tutoring program serves as a bridge between Algebra and Calculus, helping you understand linear equations, integrals, derivatives and more.

[PC: WIN 3.1 or WIN 95; 486; 4mb]

Vendor Price: $49.95

Borders Price: $39.95



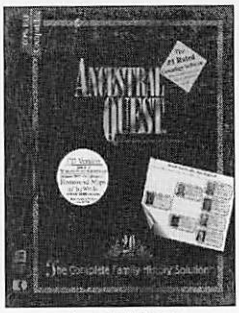
Speed Math
Encore Software

Add, subtract, multiply or divide even large numbers in your head instantly with the foolproof methods, steps and tricks in Speed Math.

[PC: WIN 3.1 or WIN 95; 386; 4mb]

Vendor Price: $29.95

Borders Price: $21.95



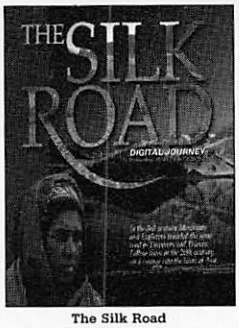
Ancestral Quest
Incline Software

This complete family history solution combines a powerful genealogy program with advanced multimedia scrapbook features.

[PC: WIN 3.1 or WIN 95; 486; 4mb]

Vendor Price: $49.95

Borders Price: $34.95



The Silk Road
DNA Multimedia

Study the peoples, history, languages, religions and explorers of this ancient trade route as you journey over its high steppes and hot deserts.

[PC: WIN 3.1 or WIN 95; 486; 4mb]
[MAC: Sys 7.0; 68030; 2.5mb]
Hybrid: works on PC and MAC systems

Vendor Price: $49.95

Borders Price: $34.95

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Tom McDonald

Columnist

Tom McDonald has been writing about games for more than six years. He also writes about history and fiction, and has written several books. In his spare time he collects books, plays with his dog, and does other stuff you don't really care about.

CH Pro Throttle

Finally, the best joystick company gets around to making a good programmable throttle. With the Flightstick Pro and CH Rudders wired into this baby, you'll be flying in no time.

PRICE: $189.95
COMPANY: CH Products
PHONE: 619.598.2518
URL: www.chproducts.com

Duke Nukem 3D

Absolutely the best first-person action game of the year, bar none. Funny, exciting, packed with puzzles and cool stuff, *Duke* is the undisputed king.

PRICE: $39.95
COMPANY: 3D Realms
PHONE: 800.337.3256
URL: www.3drealms.com

Quake

Though *Duke* wins the solo play contest hands down, nothing can touch *Quake* when it comes to head-to-head play. Use QuakeSpy, Mplayer, or any one of numerous Internet solutions, and you'll be raising hell with the best of them in no time.

PRICE: $39.95
COMPANY: id Software
PHONE: 800.434.2637
URL: www.idsoftware.com

Civilization II

Siddown, kids, and let grandaddy show you how it's done. A face-lift, better play balancing, and several system refinements bring this classic game head-on into the next generation.

PRICE: $49.99
COMPANY: MicroProse
PHONE: 510.522.1164
URL: www.microprose.com

Kali

Play games over the Internet with a local dial-up number. Almost infinite play time at one low price (depending on your ISP's plan) bringing online gaming to the masses. Long live Jay Cotton!

PRICE: $20
COMPANY: Kali
PHONE: 801.523.8221
URL: www.gateway.net/kali/regkali.html

Color QuickCam

This cool little cue ball of a camera puts 24-bit digital video and still snapshots on your PC's screen with a minimum of fuss and very little muss.

PRICE: $299
COMPANY: Connectix
PHONE: 800.950.5880
URL: www.connectix.com

IBM ThinkPad 760ED

I want it... and I want it *now*. Small, powerful, and stacked to the gills, this little notebook has everything you could possibly want, to go from Net cruising to working to gaming. Please send me one, Big Blue.

PRICE: $6,999
COMPANY: IBM
PHONE: 800.426.7235 x4340
URL: www.ibm.com

iomega Zip Drive

An inexpensive, compact, easy-to-use solution to backups. For those of us who have been using tapes or simply fearing that day when the hard drive goes bye-bye, these are a real blessing.

PRICE: $199.95
COMPANY: iomega
PHONE: 800.697.8833
URL: www.iomega.com

Monster Truck Madness

So shoot me, I think this stupid little game is a blast. Just pure mud-slipping, tire-spinning, red-neck fun. Plus, it has Netplay!

PRICE: $39.95
COMPANY: Microsoft
PHONE: 800.426.9400
URL: www.msn.com

Close Combat

Breaks the mold of strategy gaming with a landmark psychological model, realistic approach to combat, and some truly hair-raising fun. One of the first war games to actually move beyond the old forms and venture boldly into new territory.

PRICE: $49.95
COMPANY: Microsoft
PHONE: 800.426.9400
URL: www.msn.com

Close Combat

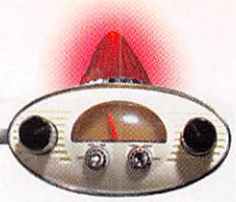
Duke Nukem 3D

CH Pro Throttle

Quake

Sean Downey

Disc Editor



Sean Downey is *boot*'s Disc Editor. He is renowned company-wide for his ability to breath life into any computer: Just some silicon, electricity, a little spit, and you've got yourself a system. His qualifications for the job stem from a dubious past of software piracy.

HP Vectra XW

A system to grow into. Workstation-class power with a 200MHz Pentium Pro, 32MB of RAM in the form of two 72 pin ECC DIMMs, onboard 3D graphics accelerator, and a 2GB SCSI-2 hard drive with NT 4.0 preinstalled. The single CPU model would do fine.

PRICE: $8,249
COMPANY: Hewlett-Packard
PHONE: 800.322.4772
URL: www.hp.com/go/vectra

Tomahawk 9 Ultra Wide SCSI Hard Drive

I just hate running out of space on my hard drive. This 3.5 inch marvel packs 9.1GB revolving at 7200RPM with a maximum throughput of 40MB/sec. You'd be amazed at just how quickly I could fill this up.

PRICE: $2,965
COMPANY: Micropolis
PHONE: 800.395.3748
URL: www.micropolis.com

CDD2000 CD-R Drive

Flexscan T67S

When you've experienced the wonder of a 20-inch monitor, you soon realize there's no going back. This stunning model delivers 20 inches of display at .25 mm dot pitch with resolutions up to 1600x1280. It also offers two sets of connectors (DB-15 and BNC), so you can hook the monitor to two machines simultaneously.

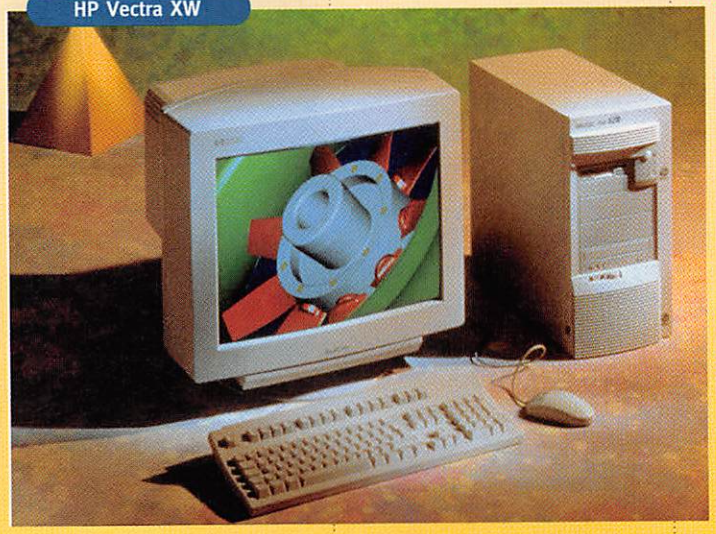
PRICE: TBA
COMPANY: Eizo (Nanao)
PHONE: 800.800.5202
URL: www.excom.ch/f/eizo/t67.htm

CDD2000 CD-R drive

This 4x-read, 2x-write external drive has taken everything I could throw at it. CD-Rs are great for portable mass storage solutions. Who needs a removable cartridge drive when you have 650MB of multisession-capable storage space that can be read on any computer with a CD-ROM drive? The media is cheaper too.

PRICE: $699
COMPANY: Philips
PHONE: 800.235.7373
URL: www.philips.com/sv

HP Vectra XW



Hexen II

Hexen with the *Quake* engine. The wizards of id are definitely onto something here. If you've ever played a *Quake* deathmatch with axes, then you'll understand why this is so exciting.

PRICE: $39.95
COMPANY: id Software
PHONE: 800.434.2637
URL: www.idsoftware.com

Diablo

My personal favorite game of the year. With outstanding graphics that make the little 3D figures look like they have spontaneously come to life. Just for fun, toss in network play, random dungeon generation, and good ol' Mephistopheles himself —this game has it all. If you don't like it, to Hell with you!

PRICE: $54.95
COMPANY: Blizzard
PHONE: 800.953.7669
URL: www.blizzard.com/diablo/diablo.htm

Intel Express 100BASE-T Hub

I hate latency. For the ultimate multiplayer experience this will give you more speed than you'll concievably ever need. Of course I'll need several 100BASE-T network cards as well.

PRICE: $2,395
COMPANY: Intel
PHONE: 800.538.3373
URL: www.intel.com

BitSURFER Pro ISA ISDN Modem

BitSURFR Pro ISA ISDN Modem

Internal ISDN modem. Blazing user-programmable bandwidth ranging from 56Kbps for a single B-channel to 128Kbps when bonded. I'll pay for the line... On second thought, I'll buy the modem and lust after an ISDN line.

PRICE: $359.95
COMPANY: Motorola
PHONE: 508.261.4000
URL: www.mot.com

Targa 2000 Video Capture Card

The video editing bug has got me bad, and this is an awesome solution to capturing and digitizing video. The Targa supports 720x576 resolution at 30fps.

PRICE: $4,995
COMPANY: TrueVision
PHONE: 800.858.8783
URL: www.truevision.com

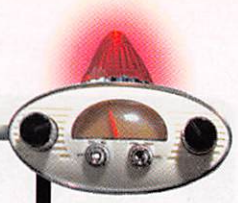
Back-UPS Pro 1400

A hardware and data insurance policy. This little box delivers enough juice to keep your workstation *and* your refrigerator going in the event of a power outage. Nothing can stop me now.

PRICE: $ 759
COMPANY: APC
PHONE: 800.800.4272
URL: www.apcc.com

Ingrid Bush

Production Editor

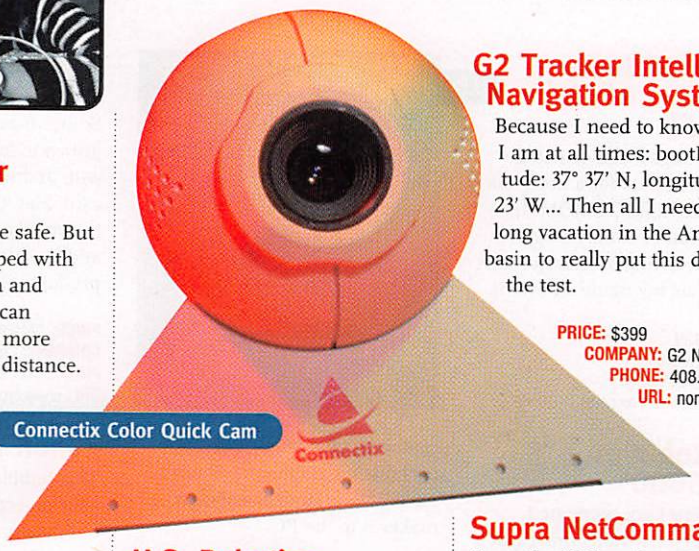


Ingrid Bush is the Production Editor at boot. When she isn't harassing the *boot* boys about deadlines and preventing them from using the word "got," she avidly seeks information about conspiracy theories and Catwoman.

Connectix Color QuickCam

They thought they were safe. But I'll be back, and equipped with Connectix's QuickCam and *CU-SeeMe* software, I can harass my family even more effectively from a long distance.

PRICE: $229
COMPANY: Connectix
PHONE: 800.950.5880
URL: www.connectix.com



Connectix Color Quick Cam

G2 Tracker Intelligent Navigation System

Because I need to know where I am at all times: bootLab latitude: 37° 37' N, longitude: 122° 23' W... Then all I need is a long vacation in the Amazon basin to really put this device to the test.

PRICE: $399
COMPANY: G2 Navigation
PHONE: 408.395.5989
URL: none

Nokia 9000

This is a "Lust List" right? So, give me e-mail capabilities, speakerphone, and cell phone Internet access in the palm of my hand; and to hell with the cost.

PRICE: $3,000
COMPANY: Nokia
PHONE: 800.666.5553
URL: www.nokia.com

KX-PS600

I want convenience, not a workhorse; so the four machines in one: fax, scanner, printer, and copier of the KX-PS600 would provide me with the perfect portable office in my micro-sized apartment.

PRICE: $799
COMPANY: Panasonic Communications & System Co.
PHONE: 800.742.8086
URL: www.panasonic.com

U.S. Robotics Pilot 5000

Like 007... my Pilot PDA with its handwriting recognition package and stylus will go everywhere with me. I'll record my new cocktail ideas and sync them to my desktop; and the security program will ensure the info remains classified. This is just the beginning... Lamborghini that doubles as a jet ski... breath freshener that's really a handgun...

PRICE: $369
COMPANY: U.S. Robotics
PHONE: 415.949.9560
URL: www.usr.com

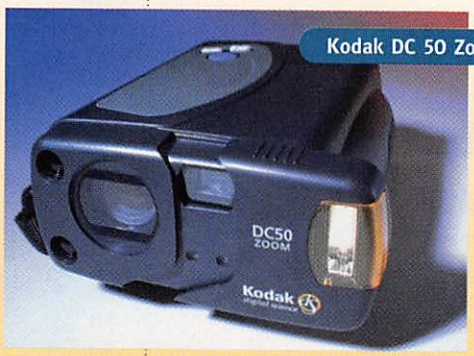
Supra NetCommander

Scrap the 33Kbps, I want ISDN, Plug-and-Play, and speedy transfer rates. The NetCommander's impressive software; full ringing support; and ability to chat while downloading files from the Net will make my online life a veritable paradise—and it won't cramp my analog social life.

PRICE: $299
COMPANY: Diamond Multimedia
PHONE: 800.468.5846
URL: www.diamondmm.com

Kodak DC-50

Ease of use, combined with plenty of memory, plus removable storage cards, make the DC-50 worth lusting after. It may weigh extra, but I need the upper body work and the DC50's convenience, and image quality that goes beyond "high" and "low," make this my pick of the digital camera lot.



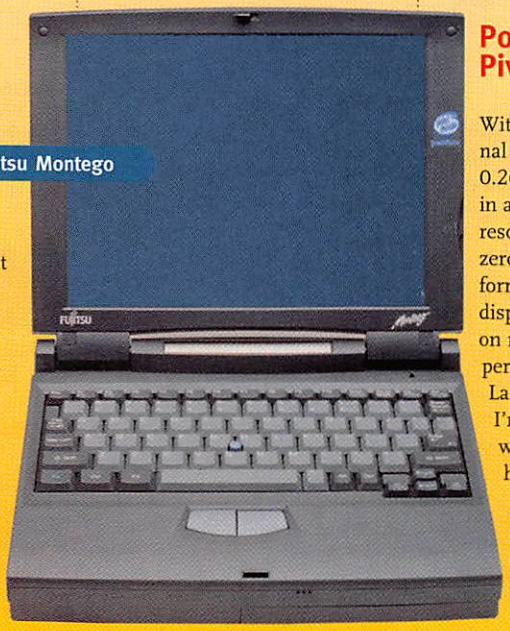
Kodak DC 50 Zoom

PRICE: $1,000
COMPANY: Eastman Kodak Company
PHONE: 800.235.6325
URL: www.kodak.com/daiHome/DC50/

Fujitsu Montego

It may not be king of all multimedia, but it has what I need: true portability. With a built-in floppy drive; long battery life; and weighing in just under five pounds, I can work for hours on the road, without AC. Hook up a portable CD-ROM drive, and I'm set.

PRICE: $2,999.99
COMPANY: Fujitsu PC
PHONE: 888.466.8434
URL: www.fujitsu.com



Fujitsu Montego

Portrait Displays Pivot 2100

With 20.2 inches of diagonal viewing area and a 0.26mm dot pitch clocking in at 75Hz with 1600x1200 resolution, the Pivot makes zero compromises. Even its format is flexibile: Portrait display when I'm working on magazine pages at 200 percent magnification; Landscape mode for when I'm teaching the tech boys who's boss in the dark halls of *Quake*.

PRICE: $999
COMPANY: Pivot Displays
PHONE: 800.858.7744
URL: www.portrait.com

Mind of a Killer

This is one CD-ROM I must have. All the psychopaths in one place. It may not be a hot new product, but it's still on my list. Santa, get those helpers busy, 'cos I'm waiting.

PRICE: $30.98
COMPANY: Cambrix Publishing
PHONE: 818.992.8484
URL: none

Shel Kimen

Columist

Shel Kimen, a real '90s kinda gal, lobbying for T1 lines in every household during the day and surfing endless Web sites evangelizing Java by night. When she does finally succumb to the lure of slumber, she sleep talks in straight HTML.

Micron Millenia TransPort P133 12.1 TFT

With the largest active-matrix monitor available for a notebook, an 8x removable CD-ROM drive, a bucket full of battery power, and KICK AXE performance, this yummy has my name all over it.

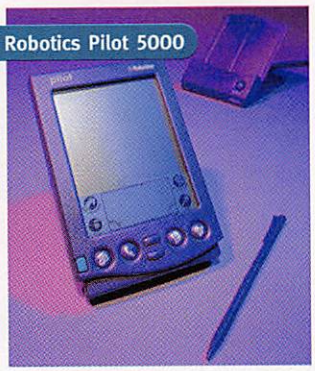
PRICE: $5,199
COMPANY: Micron
PHONE: 800.209.9686
URL: www.mel.micron.com

U.S. Robotics Pilot 5000

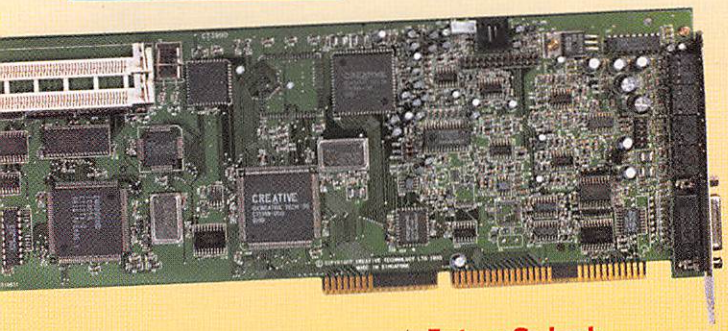
Everywhere I go, everyone I meet, everyone wants this capable little PDA. Maybe because it's cute, maybe because it's functional. Maybe because it's just RAD! I must have this dynamo.

PRICE: $369
COMPANY: U.S. Robotics
PHONE: 800.342.5877
URL: www.usr.com

U.S. Robotics Pilot 5000



Sound Blaster AWE32 PnP



FutureSplash Animator

It's just what this Web-weaving world needs now: A better software program to make Web animations. Animation is de rigeur on modern Web pages, but overhead can be prohibitive. This beauty's file sizes are small and it's eeezeee to use.

PRICE: $250
COMPANY: Futurewave Software
PHONE: 800.619.6193
URL: www.futurewave.com

HiJaack Pro 4.0

A smart utility suite for PC users. It has the world's most powerful graphics converters (more powerful than *Paintshop Pro*), screen capturing, and shell extensions for creating graphic file thumbnails. It'll do until *Debabilizer* makes it to the PC.

PRICE: $250
COMPANY: Quarterdeck
PHONE: 800.354.3222
URL: www.quarterdeck.com

Liquid Motion

When it's hot, it's hot! Java's hot and DimensionX's *Liquid Motion* lets you build Java applets with drag-and-drop ease. Since I gotta have my Java, I gotta have *Liquid Motion*. Way cool!

PRICE: $149
COMPANY: DimensionX
PHONE: 888.369.5282
URL: www.dimensionx.com

AT&T Digital PCS Service

While MCI is trying to pull off the same stunt, AT&T's ultra-cool service combines voice, messaging, and paging with a single phone line (available in 40 major cities so far).

PRICE: $24.99 per month base
COMPANY: AT&T
PHONE: 206.803.4000
URL: www.attws.com

Sony Multiscan 20sf11

Twenty inches of rock-steady res madness. Sony sure knows how to build 'em. If your eyes are locked to your PC day and night, make sure you have a more than brilliant monitor.

PRICE: $1,699
COMPANY: Sony
PHONE: 800.352.7669
URL: www.sony.com

Sound Blaster AWE32 PnP

Sound Blaster, a name we've all grown to love and trust, tops off with another exceptional sound card. Hey Creative Labs! Stick to the standard-setting sound cards and keep looking forward with products such as this one.

PRICE: $249.95
COMPANY: Creative Labs
PHONE: 800.998.1000
URL: www.creativelabs.com

Canon BJC-70

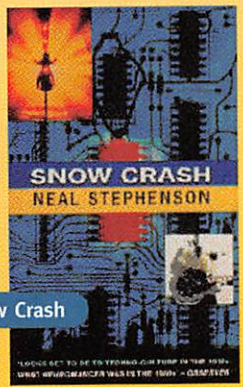
This bubble-jet beauty captures your on-screen world and spits it out into your real world in living color. Weighing in at four pounds, you can't beat it for price, weight, or quality.

PRICE: $300
COMPANY: Canon
PHONE: 800.848.4123
URL: www.canon.com

Snow Crash

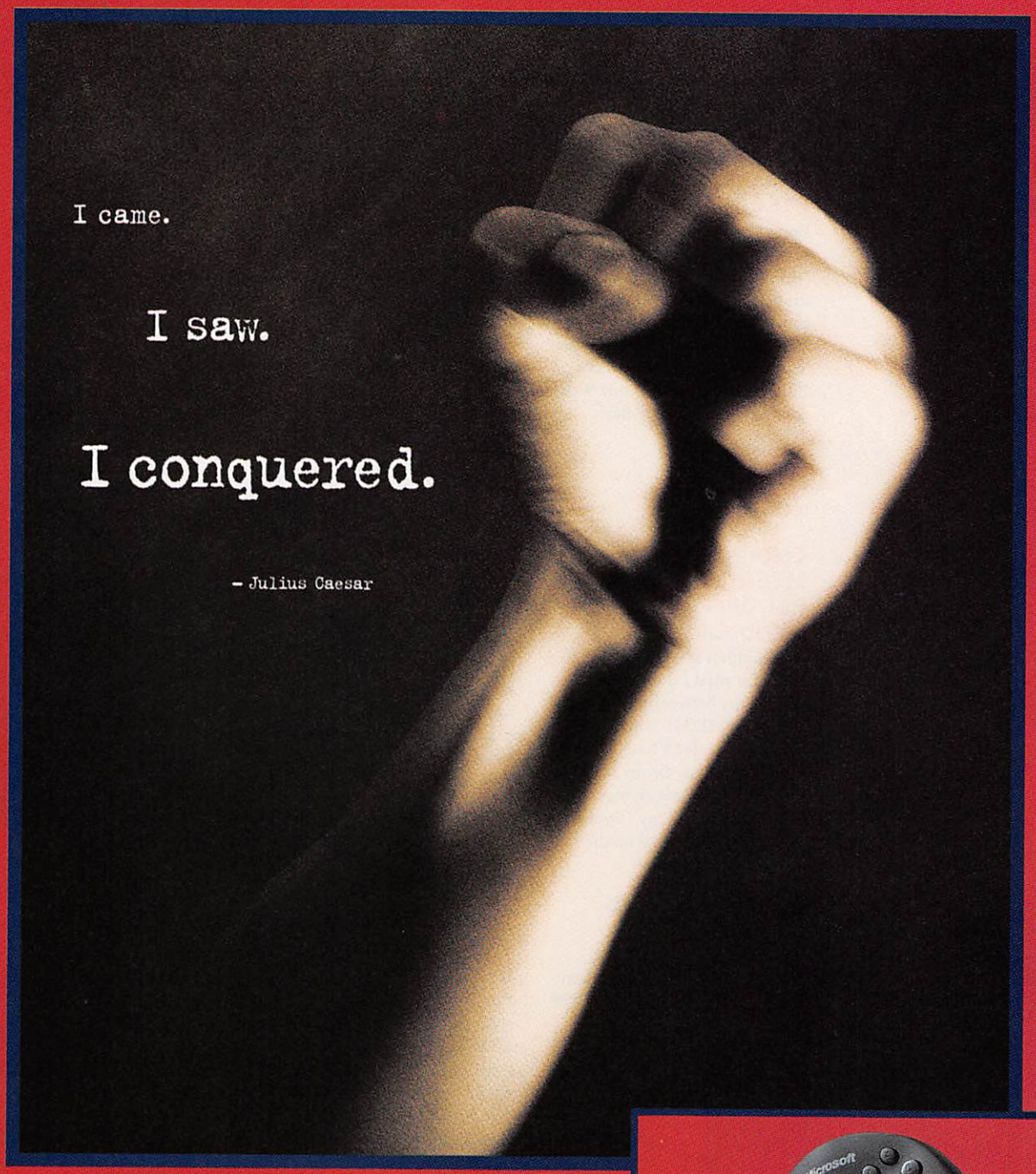
So what if this book's so old it could legitimately be called a classic? If you haven't read it yet, do so immediately! Neal Stephenson foresaw a cultural revolution and managed to maintain his perspective. Forget all the cyberspace hype and take it for what it is—a comical look at the networked future we all live in today (or maybe tomorrow, at the latest).

PRICE: $4.95
COMPANY: Bantam Books
ISBN: 0-553-56261-4



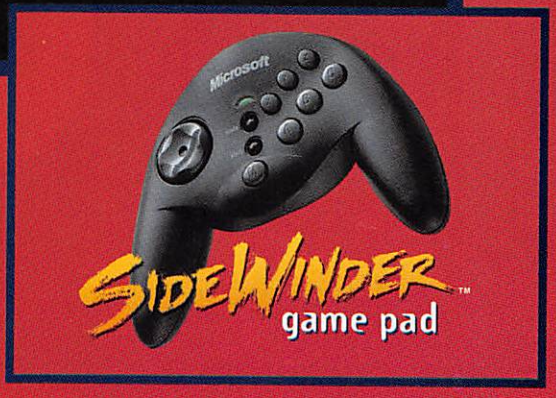
Snow Crash

Future Splash Animator



Absolute victory. Total control.

With all the buttons you could ever need, the Microsoft® SideWinder™ game pad is going to give your white knuckled hands the ride of their life on all of your Windows® 95 games. Hard to remember multi-button moves are a stroll through the park as you can map them to a single button on the game pad. Suddenly someone is wondering what just hit him. The SideWinder game pad is perfect for a little ugly head-to-head action since you can connect up to 4 game pads for fully functional, multi-player play. All of which are great reasons to buy more than just one. So step out of the way, because the battle is about to begin.



Microsoft

Where do you want to go today?® www.microsoft.com/sidewinder/

©1996 Microsoft Corporation. All rights reserved. Microsoft, *Where do you want to go today?* and Windows are registered trademarks and SideWinder is a trademark of Microsoft Corporation.

Daevid Vincent

Webmaster

Daevid Vincent, whose exoskeleton appears as cybernetic as the audio he listens to, is a sound chemist. He has experienced virtually every computing device, from a common calculator to the most advanced Unix systems (which he prefers), and Daevid is *boot*'s Webmaster.

Nimantics Orion P166 Notebook

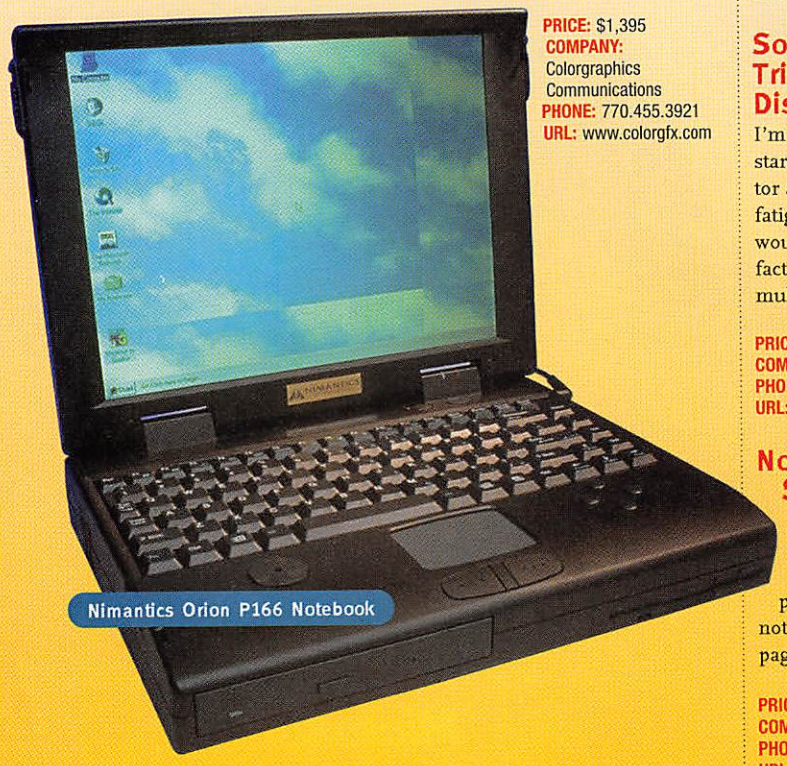
Because I travel a lot and spend many a wasted hour waiting for "things;" as in traffic, people or dinner, I would like to be able to access any and all the information I need when I need it. I can also follow the example of our Editor In Chief and do our Web pages on a boat in the Bay!

PRICE: $4,499
COMPANY: Nimantics
PHONE: 800.646.5005
URL: www.nimantics.com

Colorgraphics MEGA Lightning PCI Dual Monitor Video Card

One monitor is NOT enough space for what I do! I would like to have my browser on one monitor and my HTML editor in another, so I don't have to keep flipping screens. Or my MIDI sequencer's screen on one side of my studio, and my *Direct-to-Disk Recording* screen on the other.

PRICE: $1,395
COMPANY: Colorgraphics Communications
PHONE: 770.455.3921
URL: www.colorgfx.com



Nimantics Orion P166 Notebook

Ricochet Wireless Modem

I'd like to be able to go online any time and any where I am. I want to be able to get my e-mail messages at any place, whether it be walking around the city, shopping, or at the clubs, eating at a diner... the possiblilities are endless.

PRICE: $40 per month (rental plus basic service)
COMPANY: Metricom
PHONE: 800.556.6123
URL: www.metricom.com

Yamaha CDE-102II Recordable CD

I like to archive things constantly but tape is way too slow and inconvienient to retrieve data from. With a gold disc, you just pop it in, search, and copy. Simple as that. It is also a great way to send large files to others, since almost everyone these days has a CD-ROM drive of some kind in their machine.

PRICE: $1,200
COMPANY: Yamaha
PHONE: 800.825.6414
URL: www.yamaha.com

Sony Multiscan 20sfII Trinitron Graphic Display

I'm tired of squinting. When I stare at a dinky lil' 17-inch monitor all day, I tend to get very fatigued. A 1600xl200 NI display would really open my eyes; in fact, I'll take two to go with my multiheaded video card!

PRICE: $1,700
COMPANY: Sony
PHONE: 800.352.7669
URL: www.sel.sony.com/

Nokia 9000 or the Sharp Zaurus PDA

One of these babies is much more convienient to carry around than my rolodex of papers and post-it notes and notebook and cell phone and pager and...

PRICE: $700
COMPANY: Sharp
PHONE: 800.447.9469
URL: www.zaurus.com/zaurus.htm

PRICE: $3,000
COMPANY: Nokia
PHONE: 800.666.5553
URL: www.nokia.com

Connectix Color Quick Cam

I want to try some *CU-See-Me*. I've already got the voice telephony stuff workin', now it's time for the next step and see what I've been missing!

PRICE: $229
COMPANY: Connectix
PHONE: 800.950.5880
URL: www.connectix.com

Ricochet Wireless Modem

Cable Modem Line at Home

At 10Mbits per second Down-Stream, I would cut the time I spend surfing and searching by an order of magnitude. And won't my live camera and audio feeds be awesome in real time?

PRICE: $35 per month; $100 setup fee
COMPANY: @ Home Network
PHONE: 415.944.7200
URL: www.home.net

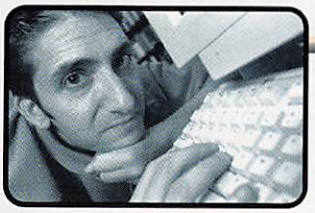
Touch Window's Touch-Screen Monitor Overlay

It would really come in handy for doing things like Web browsing or music/MIDI applications. It would make all those embossed buttons actually seem real, and it also would save a heck of a lot of desktop space.

PRICE: $300
COMPANY: Touch Screens
PHONE: 800.753.2441
URL: www.touchwindow.com

Jon Phillips

Columnist



Force Feedback Joystick

Nintendo 64 with Super Mario 64

Our meandering mason isn't available for PC, and likely never will be available for PC. Sure a P166 with add-ons up the keyster may be the ultimate gaming platform, but the N64 is a veritable museum piece; some kind of wild multimedia theater installation. Give it to me, baby.

PRICE: $249
COMPANY: Nintendo
PHONE: 800.255.3700
URL: www.nintendo.com

Ascend MAX modem

Allow me to explore my inner greed. For my basic Internet needs, I don't really need a single box capable of up to 96 digital dial-up connections. But I do like basking in the knowledge that another 95 connections are ready to go, should I decide to get into the ISP business. Slip me some slack, people. At least I didn't lust for the MAX TNT, capable of up to 627 concurrent calls!

PRICE: $2,400
COMPANY: Ascend
PHONE: 800.621.9578
URL: www.ascend.com

Zenith HomeWorks Universal Cable Modem

OK, so maybe the ISDN connectivity offered by the Ascend MAX won't be enough in a few months. Let's stay relatively technology-proof, and ask Santy for a badass cable modem capable of 4Mbps downstream data transfers. When ya coming to my town, Mr. Internet Cable Company? Get here soon, Jocko!

PRICE: $400
COMPANY: Zenith Electronics
PHONE: 847.391.8181
URL: www.zenith.com

SGI Onyx

To hell with Pentiums and MMX. Give me an Onyx, the same box that powers the Magic Edge location-based VR flight sims found in Tokyo, Sydney, and other select locations around the globe. This baby holds up to 24 MIPS R10000 processors, and up to 16 gigs of 8-way interleaved memory. So what's Phillips going to do with it? Plan A: Hook it up to my noggin and do a full-on brain dump. Plan B: Gut the mother, and use it to refrigerate seven or eight cases of good old American suds.

PRICE: $165,000
COMPANY: Silicon Graphics
PHONE: 800.800.7441
URL: www.sgi.com

Casio QV-10 Digital Camera

Sometimes convenience is more important than power specs. Other digital cameras on the market offer higher resolutions, but this device is perfectly swank for its modest hobbyist intentions. The QV-10 can hold up to 96 digital images, all immediately visible through an LCD color display. I'll use mine to gather content for my Web site.

PRICE: $699
COMPANY: Casio
PHONE: 800.848.9441
URL: www.casio.com

Force Feedback Joystick

I'm torn between competing devices from CH Products and Immersion Corp. Regardless of which joystick Santa delivers, I'm looking forward to jolts, vibrations, and other types of play-triggered resistance. Let's bring those gaming experiences a few steps closer to true pain.

PRICE: $149
COMPANY: Immersion
PHONE: 408.467.1900
URL: www.immersion.com

Interactive I/O Virtual Vehicle JD

I hope the JD stands for "juvenile delinquent," because I'm gonna be both juvenile and socially delinquent when I use this bucket seat/steering wheel/foot pedal contraption for my favorite racing games. Now I just need a device that can simulate truck dancing, and we'll be in business.

PRICE: $1,295
COMPANY: Interactive I/O
PHONE: 714.921.2393

Coherent Infinity Pulsed Laser

The Coherent company wants me to use my new laser for spectroscopy and holography. To hell with them. I'm gonna use my new destructo beam for burning the tires off of parked cars. And when those dirty street bums begin crowding my doorway again, well, I'll just train my beam on them, too.

PRICE: $112,000
COMPANY: Coherent
PHONE: 800.527.3780
URL: www.cohr.com/clg/clg_products/clg_infinity.html

3D Studio Max

Bring on the wireframes! Even *boot* says this 3D modeling package is too technically complex for beginners. So be it. I want complexity. Throw me in the fire, and if I'm not man enough to claw my way out, well then, to hell with me! If I wanted some namby-pamby, drag-and-drop solution for beginners, I'd waste my money on Adobe *Dimensions* for the Mac. Extruded text. Yeah, right.

PRICE: $3,495
COMPANY: Kinetix
PHONE: 415.507.5000
URL: www.ktx.com

SimEverything

Reality is for people who don't have the creativity to explore other options. Me, personally? I want to simulate every event that has ever happened, and every event that ever will happen. I know this software exists because I saw it advertised in the back of *boot* a few months back.

PRICE: free
COMPANY: Infinity Interactive
PHONE: 800.INFINITY
URL: www.infinity.com

Virtual Vehicle JD

Jon Phillips (jphil@slip.net) is Features Editor of *The Net* magazine (www.thenet-usa.com). He'd give up a year of his publishing career if the fates would just grant him the ability to slam dunk a basketball at will.

Coming soon for Windows®95

REACH OUT AND TORCH SOMEONE.

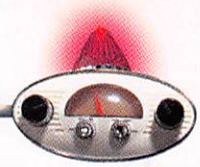
F/A-18 HORNET

The hottest flight simulator game is now torching up your Windows® 95 PC. It's F/A-18 Hornet. With incredible 3-D graphics and realistic instrumentation, it'll push you to the outer limits then bring you screaming back to earth. In fact, F/A-18 Hornet closely simulates the Navy's own attack-fighter aircraft. There's 28 different Persian Gulf combat missions to test your skills — where you can blow up everything from ammunition depots using the M61 Vulcan cannon to MiG fighters with an AIM9 Sidewinder. So pick up the award winning F/A-18 Hornet today. It's the best way to get close to someone.

GRAPHIC SIMULATIONS CORPORATION

www.graphsim.com/graphsim

Product Information Number 150



Throughout history there have been discoveries that have defied logic and refuted science:

The dark recesses of time speak of alchemists transfiguring lead into gold and thought into matter. German scientists during World War II delved into the depths of genetic engineering, and inadvertently touched upon the unknown bounds of evolution to bring back the biologically inexplicable creatures known as Sea Monkeys. Engineering's constant quest for the perpetual motion machine has yielded engineering marvels such as the little glass bird with the insatiable thirst for a mysterious red liquid. In more recent history, a brief moment in 1989 yielded the discovery of cold fusion in a jar, a marvel which could never be reduplicated.

Try it out! **Lust-O-Matic** on the **bootDisc**

This month's *bootDisc* stands on the shoulders of these historic milestones to bring you a machine that transforms pure lust into reality.

Now you can create a personalized list of our Editor's most lusted after products, tailored to your unique needs. We ranked these products according to Creativity, Innovation, Strategy, Arcade, Music/Sound, Graphics, Internet, Multiplayer, Bargain Price, and Ease of Use. Each of these categories has a slider controller next to it. Cranking the category's slider to the right sets the amount of lust you have for items with that attribute. Once the Lust-o-Matic spits out its results, clicking on the name of the item brings up a description of it. The engine that drives the Lust-o-Matic is neither scientific or logical, so the results from your personal settings may surprise you.

the boot 12-step program

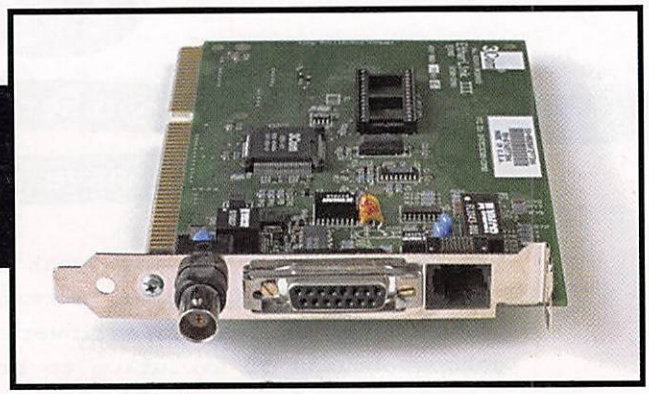
DEALING WITH YOUR PC **OBSESSION** DAY TO DAY BY BREAKING IT DOWN INTO 12 **EASY** STEPS

this month:

How to rig a cheap multiplayer game LAN

So blowin' up zombies in Quake *and fraggin' drones in* Descent *is becoming passé? Stronger Orcs aren't fulfilling the addiction? You need better opponents, not bigger ones. And what's more challenging than going* mano a mano *with another human player? Yeah, they originally thought we'd be using multiplayer networking to cooperate, teaming up to fight side by side, hip deep in the blood and entrails of a common enemy. But it was more fun to completely unload on a fellow team member, not only ruining any cooperative teamwork but changing the face of networking games forever. A new battle line has been drawn and those old monsters are nothing more than nuisances slowing you down on your quest to bathe your closest comrades in friendly fire. Dude, you just pulped your best buddy. But hey, what are friends for?*

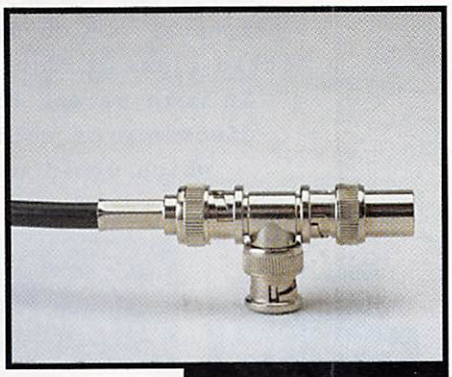
— Sean Cleveland



① This card gives you three tries at properly connecting your network cable.

1 Get Wired

There are a lot of ways to hook up machines. The secret to slaughtering your friends is to be compatible with them. If your friends already network games, ask what they use. Nothing's worse than buying a card that doesn't support the cable being used at the local fragfest, and you'll be really peeved when you realize that you lugged your box around for nothing. The two types of cabling commonly used are **coaxial** and **twisted pair**. Coax is fondly referred to as CheaperNet since it's by far the least expensive way to hook up a bunch of machines. It's like the cable that pokes out of your living room wall to feed cable TV to the boob tube, and you daisy chain it from machine to machine, and terminate it at either end. Twisted pair resembles telephone wire and requires a hub. As the name implies, a hub is where all the network lines connect. Not only is twisted pair cabling more expensive (go figure), hubs ain't cheap either.



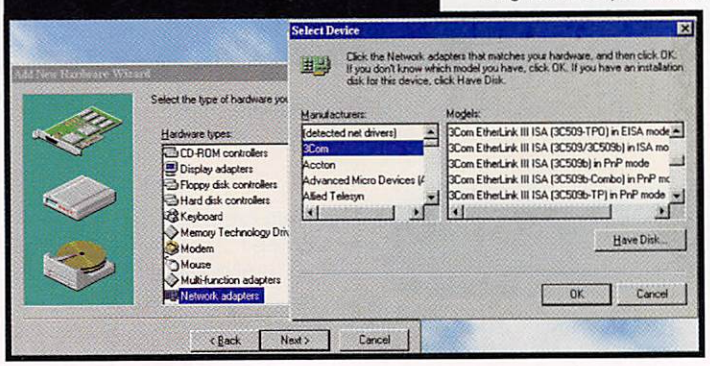
① The cabling pictured above goes by the name of coax. It leads into a BNC connector with a terminator at the end.

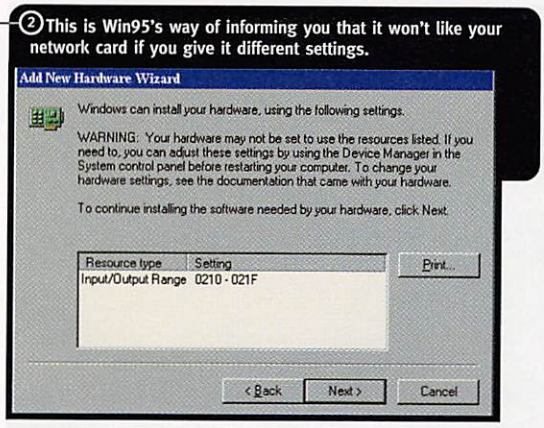
① Put one of these at either end of your daisy-chained network to properly terminate it.

2 Doing Windows

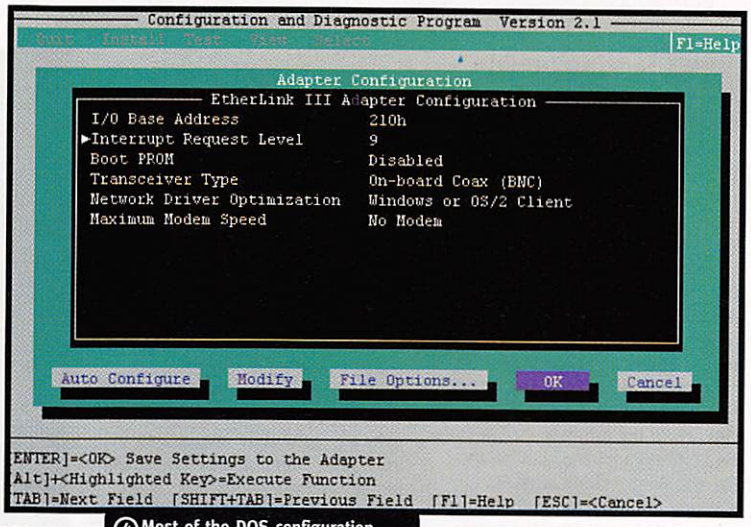
If you don't use Win95, skip to Step 3. If you're installing the network card on a Win95 system, set up the card in the operating system before even cracking your case. Win95 assigns IRQ and I/O addresses dependent upon all the other resources it's already allocated. Since this doesn't always match the settings you've given an installed card, it's usually best to find out the resources Win95 wants to assign before going in and assigning them willy-nilly with the card's DOS setup utility. Be prepared: This step will require your original Win95 disc. Choose the Add New Hardware Wizard from the Control Panel. Deny the Windows search for new hardware by selecting "No" when prompted. Selecting Network Adapters at the next prompt brings up a long list of adapter manufacturers on the right, and the different cards they manufacture on the left. Don't get too confused. If you have an ISA 3C509 3Com card, for example, choose the driver for the model '3Com EtherLink III ISA (3C509/3C509b) in ISA mode'. The next screen will give you IRQ and I/O address settings that will not conflict with any other installed hardware.

② If you can't find your card on the list, check on the driver's floppy that came with it, or pull it down from the company's Web site.





(2) This is Win95's way of informing you that it won't like your network card if you give it different settings.



(4) Most of the DOS configuration programs also serve as diagnostics to aid in troubleshooting hardware problems.

3 Insert Card Here

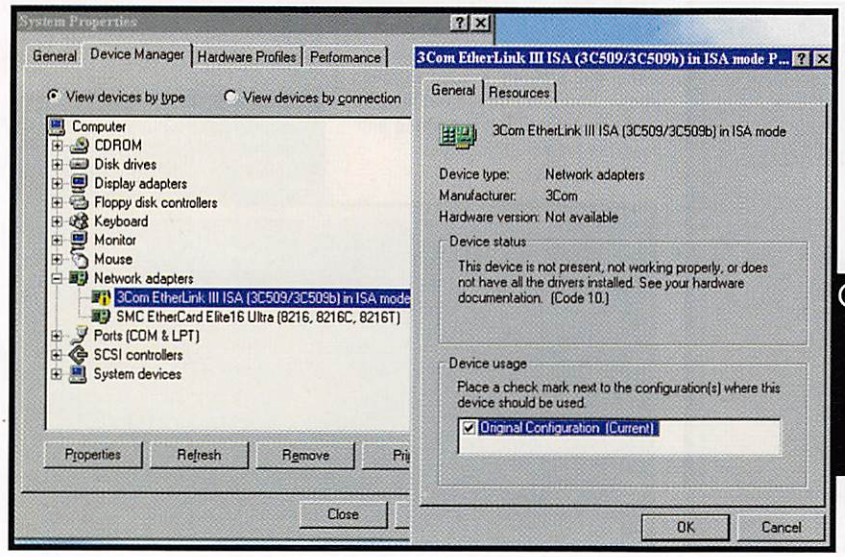
Unplug the power cord, any wires that are in the way, and remove the case. Position the machine so the motherboard is lying flat on its back. Ground yourself by touching the metal lining of the case with both feet on the floor (do *not* levitate during this step!)—this will discharge any static electricity your socks and the carpeting may have conspired to generate. Take the network card and slide it in its appropriate slot. It's best to line the card up with the ISA slot and use both hands to firmly push down on either end of the card. You've heard it before and we'll say it again: Do not force it! Screw the brace into place, put your case back on, and rehook the wires you previously rended asunder. Plug your network cabling into the back of your card and fire the beast up. You are nearly ready to flex its muscles.

4 Go Configure

Boot to DOS. If you're running Win95, bring up the Win95 Startup Menu by hitting the F8 key when the message "Starting Windows 95..." is displayed, and then choose option 7 "Safe Mode command prompt." Now you're ready to configure the card, using the software that came with the card. (If you don't have it, look on the company's Web site or BBS.) All network cards have a DOS utility to change their IRQ and I/O settings, and cable-line type. Documentation (usually found in a readme.txt file) will tell you how to do this for specific cards. Change these settings to the values you obtained way back in Step 2, along with the cable type. Save these settings and reboot back into Win95.

5 Yeah, But Does it Work?

The best way to make sure your card is correctly installed and working is to check the Win95 Device Manager, located within the System portion of the Control Panel. Something's wrong if either the yellow exclamation point or the red X appear over the mini-icon of the network card. You'll need to diagnose these problems before anybody will see you on the wire. Sit down, take a deep breath of fresh air, maybe a few aspirin, and approach this calmly. Double clicking on the network card will bring up its properties with further information to help troubleshoot the situation.



(5) You can argue until you're blue in the face but Win95 says your card just ain't there.

6 Get a handle on it!

Well, you've made it this far. Now's a good time to check your joystick or gamepad. It's considered bad battle etiquette to keep a bunch of blood-lusting animals waiting while you configure your joystick. Unless you're playing a game such as *Quake*, which allows you to join in at any time, everybody will have to quit the game and wait for your sorry ass to fix the problem. Do this enough and they'll start without you. Or just express their violent tendencies in the less-than-virtual world of your face. You'll find, as you probably already know, all the configuration options for these in the Control Panel.

7 Time to Kill

You're now ready to DESTROY your friends, uh... enemies. Select a game with a multiplayer LAN gameplay option, such as *Quake*, *Duke Nukem 3D*, *WarCraft II*, or *MechWarrior 2* and launch into it. Consult the manual or readme.txt file that accompanies each game for instructions about the steps involved to initiate network play.

Try it out!

demo on the bootDisc

Shareware

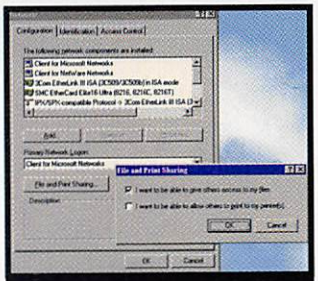
The latest shareware versions of *Quake*, *Duke Nukem 3D*, *WarCraft II*, and *MechWarrior 2* are on the *bootDisc*.

8 Setting up File and Print Sharing

As a happy coincidence, you're now only a few baby steps away from peer-to-peer networking. Simply enable File and Print Sharing for Microsoft Networks. This means no longer invoking dozens of floppy disks to move your largest files back and forth from machine to machine. You can share a drive, or a directory and let others access your files via the network. What? You don't trust your friends? Make 'em Read Only! Now, go to the Network section in the Control Panel and click on the File and Print Sharing buttons. Highlight the file sharing option, the printer option, or both. You *must* make sure everyone's part of the same Workgroup. To set up your Workgroup name, click on the Identification tab at the top of the main Network window. Name the Workgroup whatever you want—as long as everyone uses the same name. The Computer Name and Computer Description fields, however, must be unique. Shared items are set up by hand. If you wanted to share your GAMES directory, all you need do is right-click on the GAMES directory in the Explorer and click on the Sharing option displayed. Use the network administrator to map the shared drive or directory to a drive letter on another machine.

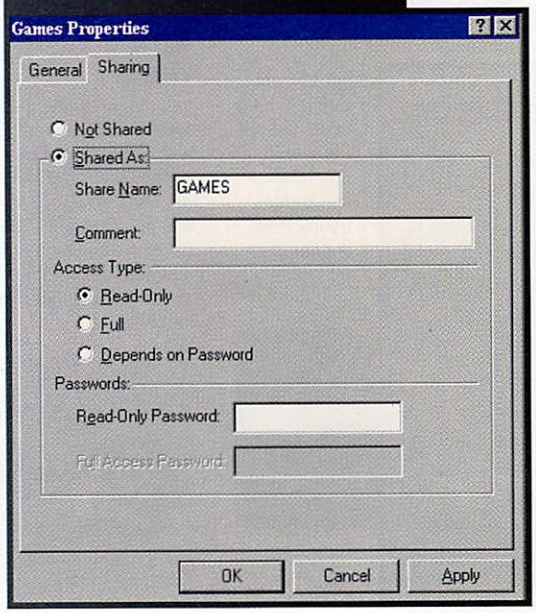
9 Enter a Pure DOS Environment

If you're planning on networking a DOS game, such as *Quake*, you don't need Win95. In fact, it just slows things down. If you have Win95 on your system, it's best to install games there first, then use the same parameters in DOS. Otherwise, follow the configuration software installation instructions from Steps 3 and 4. Don't be afraid to use the instructions that came with the network card.



⑧ If you trust your friends you can easily share files over the same link you were using to kill each other.

⑧ Setting a password for sharing rights, or allowing read-only access, are ways to make sure your data doesn't fall into the wrong hands.




```
C:\NWCLIENT>
C:\NWCLIENT>
C:\NWCLIENT>lsl
NetWare Link Support Layer v2.16 (950417)
(C) Copyright 1990-1995 Novell, Inc. All Rights Reserved.

The configuration file used was "C:\NWCLIENT\NET.CFG".
Max Boards 4, Max Stacks 4


C:\NWCLIENT>3c5x9
3Com EtherLink III MLID w/ DME  v1.51 (941003)
(C) Copyright 1994 3Com Corp.  All Rights Reserved

Int 5, Port 300, Node Address A02467DC60 L
Max Frame 1514 bytes, Line Speed 10 Mbps
Board 1, Frame ETHERNET_802.3, LSB Mode
Board 2, Frame ETHERNET_802.2, LSB Mode
Board 3, Frame ETHERNET_II, LSB Mode
Board 4, Frame ETHERNET_SNAP, LSB Mode

C:\NWCLIENT>ipxodi

NetWare IPX/SPX Protocol  v3.02  (950808)
(C) Copyright 1990-1995 Novell, Inc.  All Rights Reserved.

IPX RETRY COUNT 30
SPX LISTEN TIMEOUT 36
Bound to logical board 1 (3C5X9) : Protocol ID 0

C:\NWCLIENT>_
```

⑩ If your card is improperly configured you'll discover it when you load, or attempt to load, these drivers.

10 Getting Loaded

Copy the DOS network drivers to a directory on your hard drive. The files you're looking for are `lsl.com`, the driver for you card (3c5x9.exe a 3Com Etherlink III) and `ipxodi.com`. You'll also need a `net.cfg` file that will tell the driver what the card's parameters are. A sample can usually be found on the disc along with the drivers or one can be manually created in any DOS editor. Make sure the same Frame Type is used by all. This is usually either 802.2 or 802.3. Load all four shown in the example if you want to make sure your back is covered and load the drivers in the order explained above.

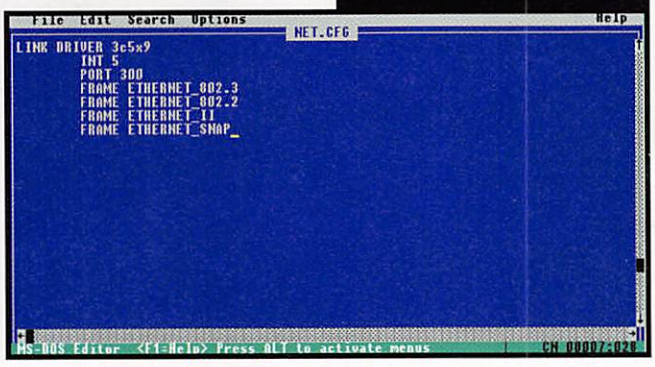
11 Better Living Through Batch Files

Done. Just change back to your game directory and follow the networking instructions that came with the game. You may want to create batch files to load these drivers more quickly. You can load any other drivers you may have in the same file as well, such as mouse drivers.

12 A New Fragrance Called Obsession

Convince your housemates that they need to devote a room entirely to network games.

⑩ This is a net.cfg with all the frame types listed. Make sure everyone is using the same frame type or you won't see each other.



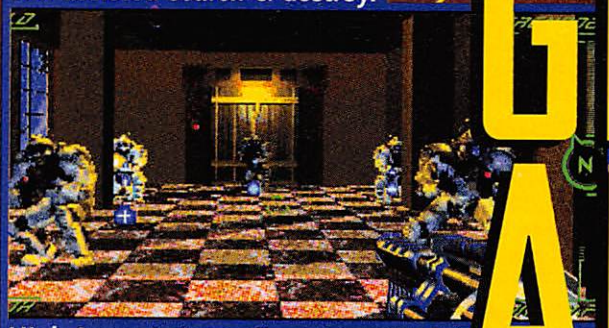
ASSUME THE ROLE OF JACK BUTCHER, AND THERE WILL BE A LOT OF PEOPLE WHO WANT YOU...DEAD.

CAUGHT IN THE CROSS-HAIRS OF AN ARMY OF TERMINATORS, YOU'LL HAVE TO FIGHT YOUR WAY TO SAFETY DODGING A FIRESTORM OF BULLETS THROUGH DOZENS OF FLOORS AND WINDING HALLWAYS OF TERROR.

NO ONE GETS OUT ALIVE

(EXCEPT MAYBE YOU)

A.I. assisted search & destroy.



High-impact cinematic cut-aways.

High-resolution real-time combat.

Daunting, hyper-realistic motion-captured enemies.

"...best-looking DOOM so far."
– Fusion

"...exhilarating first-person combat action."
– Computer Player August 1996

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boot worthy

EACH MONTH, **BOOT** EDITORS COMPILE THE BEST **PRODUCTS** IN A SPECIFIC CATEGORY AND DEEM THEM: BOOT**WORTHY**

this month:

Digital Cameras

How photography used to work: Send some specialist trained in the arcane language of *f*-stops and focal lengths out in the field to turn his or her wrist a few times to focus and twitch an index finger to snap off a shot. Then the real fun began. Your true hardcore photophile would then plunge themselves into a darkroom to futz with deadly chemicals for the next few hours, emerging with sopping wet prints that, once dry, would be handed to someone else to be slapped onto a flatbed and scanned. Your "aggressive implementer of new technologies" might actually scan the raw film directly (after processing, of course). All said and done, you're looking at teams of specialists spending days to deliver a single image capable of being posted on a Web page or laid out in a desktop publishing setup.

Welcome to our world, Mr. Flintstone. These new breed digital cameras make real world to virtual world a point-and-click proposition. And with all their innovative features, this is a no-compromise transition. Say goodbye and good riddance to film.

— Brad Dosland

Kodak DC20

PRICE: $349
MAXIMUM RESOLUTION: 493x373 at 24 bit
CAPACITY: 8 Images
COMPANY: Eastman Kodak
PHONE: 800.235.6325
URL: www.kodak.com

OK. I know what you're thinking: "This must be some sort of typo. He really means the DC20's bigger, tougher brother, the DC50. Right?" Wrong. While I love the performance and feature set on the DC50, it really doesn't distinguish itself from its class. Meanwhile the capable little DC20 is in a class all its own.

Lighter than the wallet denting my buttocks right now and oh-so-small enough to spirit away in a pocket and forget, (just remember to retrieve this puppy before those pants hit the washer, mate!) this inexpensive wonder has a feature with which no other worthwhile digital camera can compete: ultimate convenience.

Despite looking like a disposable 35mm point-and-shoot number, (better to fool the pickpockets, eh?) this mighty mite performs. It's fixed focus lens is sharp and bright, with apertures as wide as *f*4.

The built-in auto exposure program balances aperture settings with shutter speeds ranging from 1/30 of a second to 1/4000.

The DC20's images stand the test, keeping pace with its much more bulky and expensive competitors in even the most challenging lighting situations, such as low light environments where colors tend to fade and backlit scenes. This kleine kamera even handles shade with minimum bluish cast and mottling.

The DC20's images stand the test, keeping pace with its much more bulky and expensive competitors.

The LED system of notifying the happy shooter when there's only a few clicks left in the DC20's

1MB of storage is woefully inadequate and without a port for expansion cards to offload, you'll want to travel with a laptop if you expect to shoot heavily. But these are minor limitations. If I think I'll need to shoot reams of images, I'll either lug my laptop or bring another camera (working at boot, I have that option) that one with greater storage options.

But usually, when the time arrives when I want to capture the moment for posterity, a few snaps will suffice. And with the DC20 tucked away, I get the shots that previously got away.

Once images are caught, downloading them is as simple as a serial cord connection and brief download into *Photoshop* (via the included plug-in); or the solid *Photo-Enhancer SE* software which comes bundled with the DC20. The software allows for color correcting, sharpening, cheating up the resolution, and special effects to be added before saving your masterpiece in any number of popular formats.

If you really want to add some special special effects, fire up the bundled copy of Kai's *PowerGoo*. This fine MetaTools program allows you to acquire images directly from the DC20 and, once you've got them, they're yours to do with as you please: twisting and distorting your unknowing victims into the wild caricatures that might pour out of the acerbic pen of some demented political cartoonist.

Olympus D-300L

PRICE: $899
MAXIMUM RESOLUTION: 1024x768 at 24 bit
CAPACITY: 30 Images
COMPANY: Olympus
PHONE: 888.553.44825
URL: www.olympus.com

This digital wonder from the mind of Olympus is cooler than the other side of the proverbial pillow.

It's almost everything you could ever dream of in a digital camera: Incredibly high resolution for a consumer camera (the pro models sport price tags that read like the down payment on a really nice house); built-in multi-mode flash; auto focus; and an awesome color LCD monitor centered on the back of the camera, perfect for framing a tricky shot with the camera away from your face, or reviewing the day's images. The ability to share the pictures you just took, instantly—without waiting a week for prints, or an hour for rush processing, or even five minutes to hook up the camera to a PC and download the image to the screen—is an utter and total blast that must be experienced to be fully understood. It's kinda like the new breed of video cameras, with their built-in color 3-inch viewfinder/monitors, but there's something even more magical about an image frozen in time.

The ability to share the pictures you just took is a total blast!

Beyond this metaphysical musing, the color LCD is damn practical too!

When you're limited to the number of frames you can capture in the field, you really grow to appreciate the D-300L's ability to flip, one-by-one, through the images stored in it and delete specific ones. Maybe the flash wasn't set right. Or Uncle Jim blinked. Whatever. Now those faux pas need not be counted against your precious memory.

Worried that this power might run rampant, and you may inadvertently delete that snapshot of Bigfoot riding the Loch Ness monster while the Hindenberg crashes in the background? Relax. You can lock the frames that'll put your kids through college someday.

And once you have this dream machine in your hot little hands, don't miss the nine image thumbnail preview, (which the folks at Olympus like to call the "Hollywood Squares" or "Brady Bunch" mode). Way handy for getting the big picture of where you've been and where you're going.

Add in that annoying red-eye-reducing flash, time and date stamping, an ultra-sharp five-element *f*2.8 lens complete with sophisticated auto-focusing mechanism, and a handy protective sliding lens cover and you're ready to take on the world with this baby.

The D-300L reviewed above wasn't available early enough for photography. The Olympus D-200L, pictured, looks nearly identical.

Sony DSC-F1

PRICE: $849
MAXIMUM RESOLUTION: 640x480 at 24 bit
CAPACITY: 30 Images
COMPANY: Sony
PHONE: 800.352.7669
URL: www.sony.com

Sony is the undisputed king of consumer electronics, so you had to figure that any digital camera by these folks was gonna kick it.

The DSC-F1 at first glance might be mistaken for one of the new viewfinder video cameras that Gretzky pitches on the TV. With a 1.8-inch LCD viewscreen on the back to preview and review your shots and a lens that swivels up and down (conceivably to make aiming the camera easier for people whose wrists don't bend), the giveaway is the flash mounted on the swivel head alongside the lens. Flash is a technology that has not truly caught on with the video buffs.

But the little camera from Sony does have some very video camera-esque abilities, such as its 4fps Continuous mode, or the Time Machine setting that takes advantage of a buffer to capture images prior to actually clicking the shutter. The Multi-Screen effect is particularly impressive, dividing a single frame into nine thumbnails to break down an action into 1/30 second slices. Try it on your favorite local skateboarder and you'll be astounded at the motion he puts on that board during a kickflip.

The DSC-F1's 4MB of flash memory can hold 30, 58, or 108 images, but instead of reducing capture resolution, as most digital cameras do to trade off quality for expanded storage, the Sony camera changes compression schemes. Image quality still diminishes with increasingly lossy JPEG formats, but resolution hangs steady at 640x480. Normally, I wouldn't even bother bringing up these lower settings, as image quality degrades to the useless category so rapidly, but Sony's solution results in much better "low resolution" images than any other digital camera we've seen in the bootLab.

The DSC-F1 can fire its images through the ether to any IrDA equipped PC at speeds up to a smokin' 1.152Mbps!

The most innovative feature of the DSC-F1 has to be the wireless image transmission. Sometimes it can be a real hassle to climb under your desk to plug in a serial cable. And serial cable transfers tend to run around 35Kbps. The DSC-F1 can fire its images through the ether to any IrDA equipped PC at speeds up to a smokin' 1.152Mbps; 30 images in 30 seconds! The camera can also be hardwired to any TV or video monitor for playback and the Slide Show mode can loop images continuously for easy on-the-fly presentations.

When you put all this together in a 4x3x1.6-inch case; add time, date, and compression stamping, manual exposure modes, the ability to go back and delete any botched images and a rechargeable lithium-ion battery, the DSC-F1 is a powerful package that takes the concept of still camera to a new plateau.

Canon PowerShot 600

PRICE: $949
MAXIMUM RESOLUTION: 832x608 at 24 bit
CAPACITY: 18 Images (with built-in memory)
72 images (with PC card)
3,000 images (with HDD card)
COMPANY: Canon
PHONE: 800.848.4123
URL: www.ccsi.canon.com

This is a big camera.

Big size, big weight, and perhaps most importantly big time power that shames many of its contenders.

Still, there's no getting around the bulky industrial-design inspired appearance of this monster. Looking like some homage to 50's sci-fi laser blasters (or those clunkers in the pilot for *Star Trek* where everyone wore velour), the PowerShot 600 is a sturdy character.

People with small hands may have trouble getting a grip on the 3.6-inch width of the camera and desk jockeys may find hefting this muscle camera's 20-plus ounces (fully loaded) for the duration leads to some serious arm fatigue.

But if you're up to it, the PowerShot 600 is all about kicking butt and taking names.

Sure, any camera in this category can hold 18 images in its 1MB of onboard memory, but the field thins significantly when you ask for a show of hands as to who can load another 72 on a PC Card. And the room dead empties when it comes time to plug in an ATA-compatible HDD PC card. This 170MB hard disk on a card sells for $380 and holds, brace yourself, 3,000 images at 640x480. Yes, that's three-zero-zero-zero!

Canon calls this "the equivalent to digital film,"

I call this proof in a higher intelligence. It doesn't matter if your shutter finger's twitching like a sugar junkie on a Mountain Dew jag, you've somehow managed to fill

If you're up to it, the PowerShot 600 is all about kicking butt and taking names.

that 170MB vault, whip it out and pop in a new one and you're back to the races, Weegee. When it comes time to get your booty into your PC, drop the PowerShot 600 into its docking station tethered via any high-speed parallel port and you're throwing down big time into any TWAIN-compliant app, such as *Photoshop* or the bundled *Photoshop*-killer ULead's *PhotoImpact* (check out the Kick-Ass review on page 108).

Images are tack-sharp as they pass through Canon's proven glass f2.5 lens. The 7.5mm focal length is the equivalent to a 50 mm normal lens on a 35mm camera (as opposed to the slightly wide-angle view found on most digital offerings). Canon sells a 28mm wide angle adapter for $99.

Exposure is programmed automatic with TTL (vastly superior Through-The-Lens technology) readings. Shutter speeds range from 1/30 to 1/500, (which may come up short in many action situations, 1/4000 would be a better max).

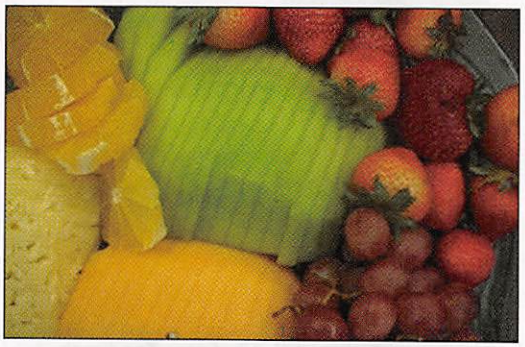
Some strange features, such as voice annotation and ultra-high resolution monochrome "text" mode (for capturing business card and spy documents) are also included.

The PowerShot 600 is a pure PC power digital camera.

SAMPLE IMAGES

Kodak DC20

Olympus D-300L



Sony DSC-F1

Canon PowerShot 600

boot

previews

HARDWARE
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SOFTWARE SOON TO SHIP

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74 Cirrus Logic **Laguna3D**

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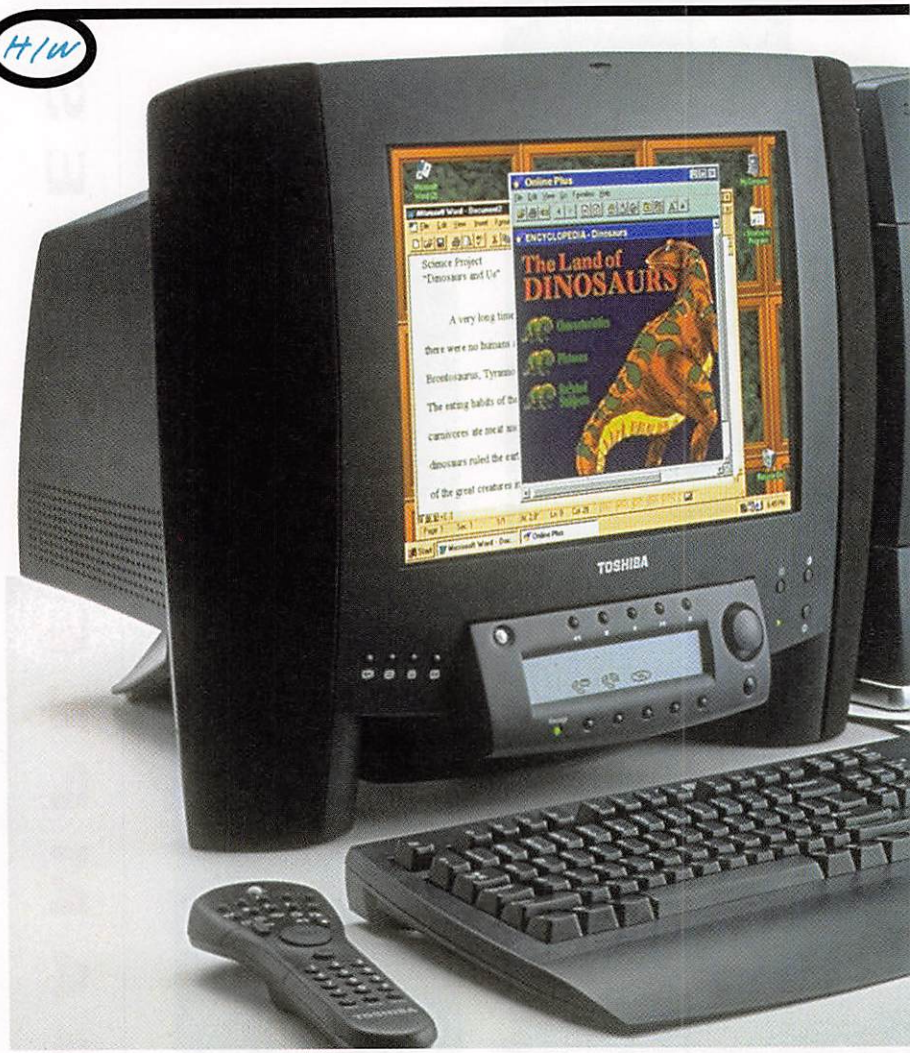
H/W



Toshiba Infinia Series

A "Back-in-Black" fashion statement

The Infinia is Toshiba's first foray into desktop computers, and a glance at their new machine's curvy exterior reveals that the veteran notebook manufacturer has been closely studying Hewlett-Packard's Pavilion line. But once you look at the screen or crack the case, the Infinia's innovative insides and Toshiba's unique 17-inch monitor deliver a much different impression than HP's offerings.

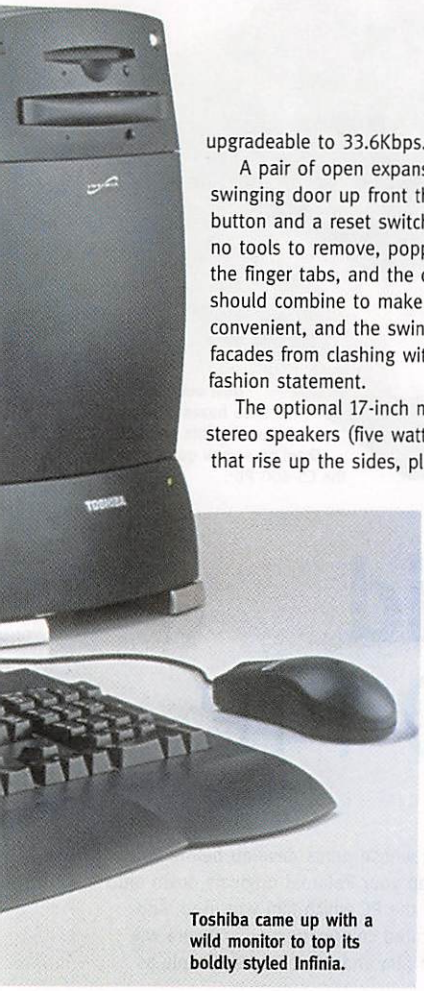
There are three computers in the Infinia line, with the top-end model 7200 featuring a 200MHz Pentium, 32MB of EDO DRAM (upgradeable to 128MB), a 3.0GB hard drive, 8x CD-ROM drive, S3 ViRGE 3D-graphics chip, a TV/FM Radio capture card, and two integrated Universal Serial Bus ports. An Infinia 7200 arrived at the bootLab just as we were going to press, giving us an opportunity to prepare this hands-on preview.

The Infinia has three ISA and three PCI slots mounted directly on the motherboard. One of each type of slot is occupied (by a fax/modem card and TV tuner, respectively). Access to the motherboard is through convenient side panel that doesn't require any screws. The ViRGE chip is mounted directly on the motherboard, as is the Sound Blaster 16-compatible wavetable synthesizer chip. The TV/FM radio card includes coaxial inputs for radio and television reception, as well as an S-video jack for video sources such as camcorders or VCRs. The built-in modem is a 28.8Kbps model, which will be software

upgradeable to 33.6Kbps.

A pair of open expansion bays are hidden behind a swinging door up front that also guards the main power up button and a reset switch. The covers for the bays require no tools to remove, popping off with simple pressure on the finger tabs, and the case opens with similar ease. This should combine to make installing additional hardware convenient, and the swinging door will keep off-white facades from clashing with the Infinia's "Back-in-Black" fashion statement.

The optional 17-inch monitor houses a pair of powered stereo speakers (five watts per channel) built into columns that rise up the sides, plus a five-watt subwoofer built into the base. In addition to on-screen volume controls, separate speaker and subwoofer dials are built into the side of the monitor. A microphone integrated into the front panel offers hands-free communication for the speakerphone/answering machine. There's also a headphone jack and a mic input on the monitor. The monitor forgoes the ubiquitous tilt/swivel base for a design that uses a chrome hinge behind the monitor to adjust viewing angle. The case sits directly on the desktop and by pressing down on the top rear of the monitor, a spring in the flexible leg in the back supports the display.



Toshiba came up with a wild monitor to top its boldly styled Infinia.

Toshiba's InTouch module is sure to prove a real conversation piece. This clever LCD screen plugs into one of the Infinia's USB ports and offers convenient push-button control over the computer's CD-ROM drive, answering machine, and TV and radio tuners. It also displays information such as the number of messages waiting and the television or radio frequency that's currently tuned in. The panel can be set on the desktop or mounted into a special bay on Toshiba's monitor. And if you like to control your computer from across the room, an infrared controller comes with the system, too.

Similar to Compaq's new Presarios and IBM's Aptivas, the Infinia's monitor dims and the hard drive spins down when there's no disk or keyboard activity. Punch the Silver button on the monitor or system, and the machine awakes within seconds. The Infinia still answers the phone, receives faxes, and even plays the radio, TV, or CDs while sleeping.

The deciding factor on the success of this foray for Toshiba will be the performance of their new line. Next month we'll spill the results of our exhaustive testing, but unlike other major Japanese consumer electronics firms entering the U.S. desktop fray, it looks as though Toshiba is jumping in with innovative features that create a system that's truly different from the pack.

— Bryan Del Rizzo

product info

AVAILABLE: dec 1996
PRICE: $2,799
COMPANY: Toshiba Information Systems
PHONE: 800.334.3445
URL: www.computers.toshiba.com

Canon Innova Media Tower Series

One speedy CD

Even after seven generations of systems, Canon isn't exactly a household name in personal computers. But its new Innova Media series looks to change that by including both an ultrafast 12x CD-ROM drive *and* an iomega Zip drive in its 166MHz and 200MHz Pentium models.

"With the release of our new Innova Media PCs, we're providing our customers with the features that meet their sophisticated needs," says Tom Perrier, director of PC sales and marketing for Canon Computer Systems. "The 12x CD-ROM is just one of the many strong technological advancements we will continue to deliver to stay in front of the competition."

Canon's MT 9800 ($3,299) will also ship with 32MB of EDO DRAM, 256K pipeline burst cache, a 3.1GB hard-disk drive, and an S3 ViRGE 3D-graphics accelerator with 2MB of video memory on the motherboard. Communications features will include a 33.6Kbps SVD telephony card with an answering machine and speakerphone, and a 12-watt-per-channel powered speaker system.

If you're in the habit of strip mining a ton of material from the Web every day, downloading your 100MB chunks straight to the cartridges in a built-in Zip drive will save you the agony of constantly deleting those mission critical GIFs and the subsequent need to defrag your hard drive, weekly; after all, even a 3.1GB drive is going to fill up and require hygienic cleaning eventually. The cartridge drive is also much better than boxes of floppies for backing up your spacious hard drive.

The 33.6Kbps SVD modem and external mic included with Innova series will be great for multiplayer games; enabling you to curse and taunt your opponents while doing online battle. Canon tech-support personnel will also use the modem (along with Radish's *Talkshop* software) to troubleshoot your system over the phone line and carry on a conversation at the same time.

All the Innova Media systems will be bundled with Netscape's *Navigator* and Microsoft's *Explorer*, Microsoft *Works 4.0*, *Quicken SE 96 Multimedia*, and *Comptons 1996 Interactive Encyclopedia*. High-end models will also include *Descent II*, *Havoc*, and *Terminal Velocity*.

— Bryan Del Rizzo

Canon hopes its Innova Media Tower series (the 200MHz Pentium MT 9800 is shown here) will increase its profile.

product info

AVAILABLE: nov 96
PRICE: Model MT 9800: $3,299
COMPANY: Canon Computer Systems Inc.
PHONE: 800.848.4123
URL: www.ccsi.canon.com

H/W

Portrait Pivot 2100

No matter how you look at it

Monitors are wide, pages are tall. That's the way it's been since the dawn of the computer age, frustrating graphic designers to no end. To work on a page in its entirety required extensive zooming out or panning around; not fun. Portrait displays solve one set of problems, but then spreadsheets, games, and other programs designed for a wide screen don't look right. There had to be a better way.

Pivot Displays found it: Build a monitor that quickly and easily rotates from one orientation to another, and pair it with software that instantly reconfigures your Windows' display for the new orientation. Their 17-inch Pivot 1700 won rave reviews for its quality and convenience. But some wanted more resolution, a bigger screen. Now Pivot has announced the 21-inch Pivot 2100.

This 100-pound monster offers 20.2 inches of diagonal viewing area, with a 0.26mm dot pitch and 200MHz of input bandwidth. This permits a maximum resolution of 1600x1200 with a 75Hz refresh rate (or 1200x1600 res in portrait mode). Front-mounted digital controls let you adjust color, white balance, brightness, contrast, screen position, sizing, pin cushion, trapezoid, rotation, parallelogram, and degaussing. You can store 25 sets of preferences in the monitor's memory.

The Pivot 2100 is EnergyStar complaint, and it abides by the MPRII emissions standard.

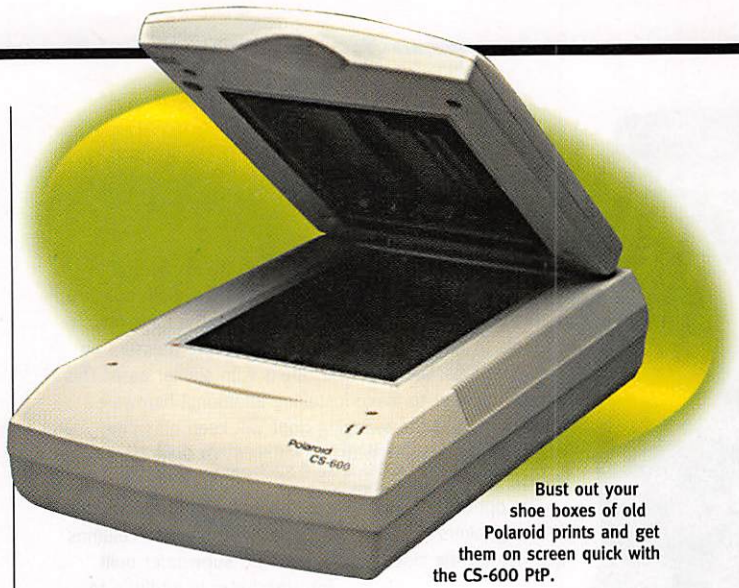
If you are working with pages (Web or paper) and like them big, check out this monitor.

— Chris Dunphy

This rendered image of the *Pivot 2100* shows how the monitor will let you have it both ways.

product info

AVAILABLE: spring 97
COMPANY: Pivot Displays
URL: www.portrait.com
PRICE: $2,999
PHONE: 800.858.7744



Bust out your shoe boxes of old Polaroid prints and get them on screen quick with the CS-600 PtP.

Polaroid CS-600 PtP

Point and click

The company known for the camera whose prints develop before your eyes, wants those pictures back. Slap your Polaroid originals down onto the CS-600 PtP flatbed scanner, tell the PC which film you used, and the rest will be automatic. Sophisticated color-correcting software will recognize the cast of each particular film and compensate. Simple as point and click.

The CS-600 PtP's engine specs are impressive as well, with 600x1200dpi optical resolution; daylight fluorescent, linear CCD array; and 36-bit color capable of capturing 68.7 million distinct colors (which breaks down to 4,096 shades of gray per RGB channel). At its maximum document size of 8.5 inches by 14 inches, the CS-600 PtP generates a 70MB file, with maximum resolution and color depth. Once you've captured your image, you'll want to share it with the world, the Web, a service bureau, or just a desktop color printer. Polaroid's proprietary color tables ensure accurate exports and CMYK seps in formats including JPEG, EPS, DCS, and Scitex CT.

The SCSI-based scanner will grab a 4x5-inch Polaroid print in roughly 60 seconds, with a nominal time of 20 milliseconds per line per color. Batch scanning software will allow up to four pictures to be scanned at once, even when they all require different scan settings.

With the optional transparent media adapter (a replacement lid that backlights film media with a scrolling light source), slides from 35mm to large format can be brought into the digital realm for manipulation and output.

The Polaroid CS-600 PtP's price and performance puts it in competition with many digital cameras... and film originals are a fabulous way to archive high-res images.

— Brad Dosland

product info

AVAILABLE: nov 96
COMPANY: Polaroid
URL: www.polaroid.com
PRICE: $1,995; transparent media adapter $495
PHONE: 800.662.8337

H/W

Force Feedback

Sticks with tricks

You've seen the degenerate Los Angeles streets of *Duke*; you've gazed down the dank halls of *Quake*; you've grown motion sick watching the world spin in *Descent*. Now, Immersion, Thrustmaster, and CH Products want you to *feel* games instead of just playing them.

Immersion's I-Force hardware architecture and software API enable peripherals such as joysticks, gamepads, and even steering wheels to physically react to the events on screen. Similar effects have been attempted in coin-op machines and location-based VR environments, but these usually only consisted of shaking generators, audio vibrations, or motion platforms.

Immersion plans to offer a force-feedback stick of its own.

Using I-Force technology, game software can send commands to peripherals that will cause physical sensations corresponding to game action. These forces, which can be assigned to the device's x- and y-axes, range from jolts to whacks, vibration, rumbling, and buffeting. Reflex jolts assigned to a button press are especially cool—there's nothing like firing a weapon during a heated battle, and feeling the joystick button shudder and recoil as you squeeze off rounds. The force of the Vectorforce can produce magnitudes of resistance on either axis, simulating G-forces, strong winds, or head-first crashes into walls. Multiple forces can be activated simultaneously to create new effects or sensations, and the level of force intensity can also be adjusted.

Games must be modified to take advantage of I-Force technology and there are 10 such games already available, including *Descent II*, *Silent Thunder*, *Need for Speed Gold*, *Monday Night Football*, and the new *JetFighter III*.

This model shows how CH Products' Force FX stick will look when it ships in December.

Immersion makes its I-Force API available royalty-free to all comers, and they encourage the creation of new forces and the royalty-free distribution of them. If force-feedback catches on (and it should), we might even see porn software developers embracing it.

Immersion and CH Products plan to ship their force-feedback joysticks this year; Thrustmaster will introduce a force-feedback steering wheel in early 1997. Street prices are expected to range from $149 to $179.

— Bryan Del Rizzo

Microsoft drops support for enhanced peripherals

Microsoft has confirmed that version 3.0 of its DirectX APIs will not include support for force-feedback joysticks or VR products—contrary to statements made by company representatives at last spring's Computer Game Developers Conference.

Such support "was never 'promised' at the GDC, just mentioned," says Microsoft's Jason White. "We should be putting support for force-feedback and VR products in DX4 or DX5."

DirectX is a bundle of APIs (including Direct3D and DirectDraw) that provide standard interfaces between hardware and software. The decision by Microsoft to not include force-feedback support is a blow to hardware and software companies currently pursuing the emerging technology; and to gamers who eagerly await it. Based on perceived promises of commitment from Microsoft, many manufacturers have not budgeted time or money for writing drivers for their upcoming enhanced peripherals; assuming DirectX 3.0 would handle them. Without the Microsoft APIs, software developers must now decide which hardware to support; manufacturers must convince developers that *their* hardware is worthy of support; and consumers must configure every piece of software they buy to work with every piece of hardware they own.

In a related move, Microsoft recently acquired EXOS, a force-feedback joystick and technology developer. The company doesn't expect to deliver force-feedback products until late 1997. Microsoft's decision to drop force-feedback support from DirectX 3.0 is seen by many as an attempt to freeze this market until Microsoft can ship its own products.

CH Products Force FX

Force-feedback sounds cool on paper, but how does the technology fare in the real world? The prototype of CH Products' Force FX stick recently arrived in the bootLab, and it's pretty damn cool.

The stick delivered a genuine feel for the road in *Need for Speed Gold*; and in *Descent II* it was a blast to release the handle and watch the stick bounce around while my craft flew through lava pits and force fields.

The mammoth prototype's huge metal footprint—and massive powerbrick—weighed in at more than eight pounds and was equipped with an F-16 Combatstick handle and hat switch. CH Products promises that shipping units will be smaller and more stylish.

product info

AVAILABLE: dec 96	**PHONE:** 408.467.1900
COMPANY: Immersion	**URL:** www.immersion.com
AVAILABLE: dec 96	**PHONE:** 619.598.2518
COMPANY: CH Products	**URL:** www.chproducts.com
AVAILABLE: spring 97	**PHONE:** 503.615.3200
COMPANY: Thrustmaster	**URL:** www.thrustmaster.com

H/W

Cirrus Logic Laguna3D

Being late has its advantages

The Laguna3D was designed with Intel's Accelerated Graphics Port in mind.

Video chip giant Cirrus Logic is joining the 3D graphics accelerator fray with its Laguna3D CL-GD5464 chip. And Creative Labs has signed on to use the part in an upcoming Graphics Blaster product.

The new chip supports hardware texture mapping, bilinear/trilinear filtering, mip mapping, compressed textures, alpha blending, transparent textures, Z-buffering, perspective correction, and fogging. All effects are done in one pass, so there is no slowdown for adding and combining multiple effects to a scene.

The Laguna3D is based on Cirrus' earlier Laguna2D architecture (the CL-GD5462) that Creative is using in its Graphics Blaster MA302 2D graphics accelerator. The new part's complete overhaul is intended to endow the chip with 3D acceleration capabilities and even more 2D horsepower. S3 took a similar path in the design of its ViRGE 3D accelerator, but since Cirrus began so much later, the company was able to design the part with Intel's Accelerated Graphics Port bus architecture in mind.

Cirrus Logic's TextureJet technology allows textures to be stored in main system memory without a major performance hit. The Laguna-3D uses some fancy bus-mastering interface logic to provide AGP-like functionality (but not AGP-like speed) over the PCI bus. An all-AGP version of the Laguna3D (the CL-GD5465) will be available to OEMs in the first half of 1997; AGP systems are expected to appear in the second half of 1997.

The CL-GD5464 is designed for use with Rambus memory, the same memory architecture in the Nintendo 64. Rambus reverses the trend toward more and more pins (128-bit paths are expensive and complicated to deal with) by using just 27 pins per Rambus channel. It compensates for any lost speed by running at 600MHz or faster, moving data at 600MB per second while allowing true random access without a speed hit—a big plus when dealing with textures.

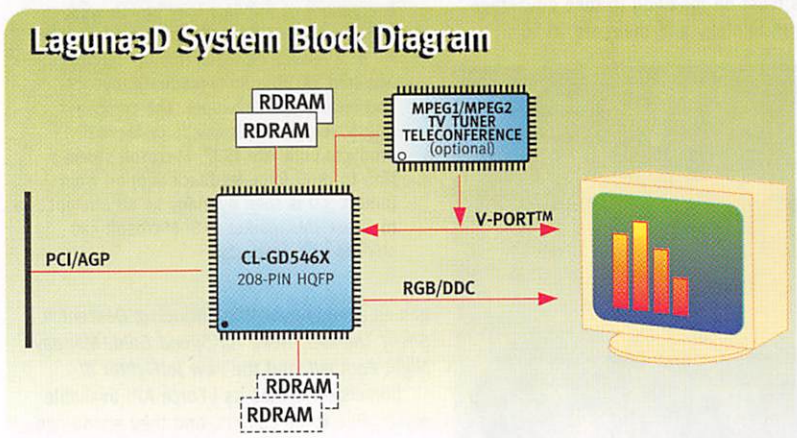
Support for Direct3D and OpenGL are integrated, but Cirrus Logic has decided not to release a proprietary API to allow maximum performance; instead, they're focusing on optimizing Direct3D performance.

The chip is capable of 1600x1200 resolution with 8-bit color and an 85Hz refresh rate; and it can produce 24-bit color at 1024x768 thanks to its integrated 230MHz DAC. The chips are priced at $29.50 each in quantities of 10,000.

Cirrus will be announcing additional Laguna3D products at fall Comdex. Sources at Cirrus told *boot* to expect to see an on-chip polygon vertice setup coprocessor, a second Rambus channel to double memory bandwidth, and faster 3D acceleration.

In other Cirrus news, the company announced that it's working with Microsoft to develop Talisman-compatible hardware, due out in late 1997. But the company declined to discuss any products that might arise from their licensing of 3DO's M2 technology.

— Chris Dunphy



product info

AVAILABLE: nov 96
PRICE: $29.50 (10,000 qty)
COMPANY: Cirrus Logic
PHONE: 510.623.8300
URL: www.cirrus.com

S/W

Dark Reign

Move over C&C

The next best thing to a great original idea is improving on a great original idea. Activision's new action/strategy game *Dark Reign* promises to out-conquer *Command & Conquer* with an impressively comprehensive game engine.

Scheduled for release in the first quarter of 1997, *Dark Reign* is set in a post-apocalyptic future. The action unfolds in the familiar top-down view, with the player controlling either the forces of the Imperium army or the rebelling Freedom Guard.

***Dark Reign* will feature SVGA graphics and an impressive array of armaments.**

The game will offer a unique "fog of war" element in which armies can hide in forests, ditches, mountain ranges, and other geographic features. You'll even be able to create impassable craters by dropping bombs, dynamically deforming the terrain.

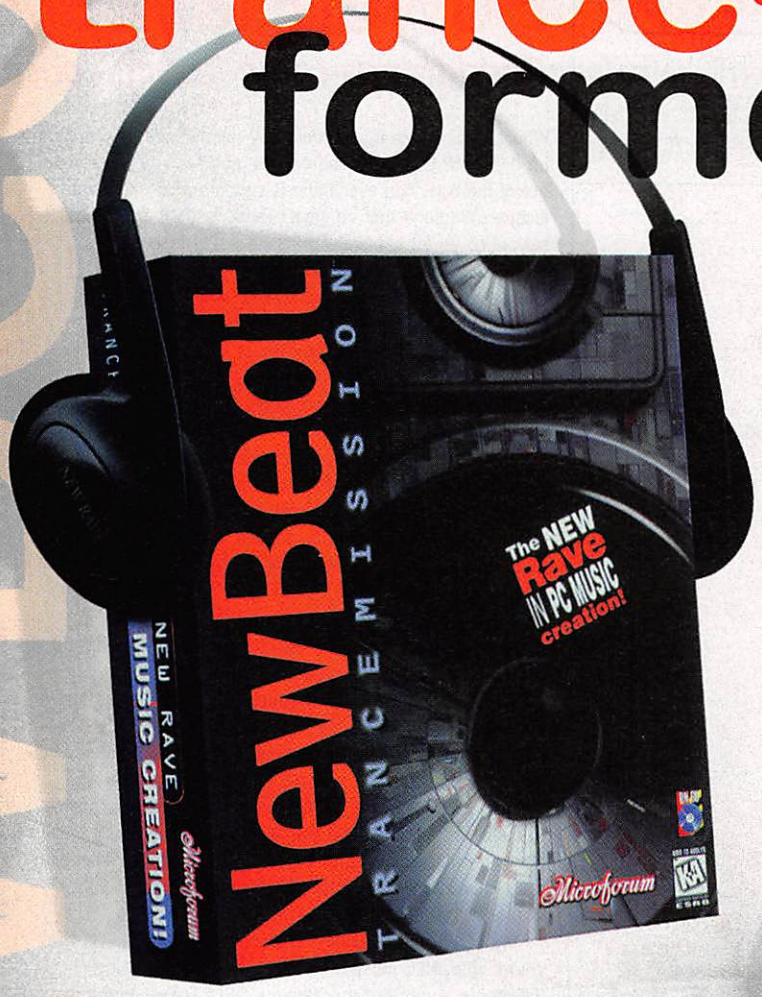
In multiplayer mode over a modem, LAN, or the Internet, players will be able to loan or give units to their allies, or just engage in a bloody free-for-all. Look for a hands-on review in an upcoming issue.

— Michael Brown

product info

AVAILABLE: First quarter 1997
PRICE: TBA
COMPANY: Activision
PHONE: 800.477.3650
URL: www.activision.com

Your PC has just been trance-formed



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- Money back guarantee - if you are not satisfied with this product, we'll refund your money

ON CD

KIDS TO ADULTS K-A CONTENT RATED BY ESRB

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Product Information Number 234

boot reviews

KICKIN' THE TIRES ON THE LATEST **HARDWARE** AND TAKIN' THE NEWEST **SOFTWARE** OUT FOR A SPIN

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H/W

boot KICK ASS! PRODUCT

NEC PowerPlayer 2020

Good things come in small packages

Wouldn't it be nice if you could buy the ultimate system right off the shelf? Configured with all the goodies you crave, right out of the box? And everything is supported by one manufacturer. Wouldn't that be great? That's just what NEC has set out to do for gamers with its PowerPlayer 2020.

NEC has definitely put together a nifty package. Open the box and you'll find nearly everything you could want in a gaming system, along with all the latest software to take advantage of it. The PowerPlayer, in many respects, is a no-compromise system. With a 200MHz Pentium and 32MB of EDO DRAM, the machine has horsepower to spare. The 3Dfx Voodoo-powered Monster 3D card by Diamond provides the most dollar-for-dollar polygon-crunching power today. ThrustMaster's FCS Mark II flight stick, Logitech's three-button mouse, and Gravis' GrIP MultiPort hub (plus a pair of matching gamepads tossed in for good measure) are quality gear and can be found on most gamers' desktops or wish lists. Top it off with Advent's excellent AV370 three-piece speaker system and you have a formidable package.

DOUBLE TAKE

THIS IS THE MACHINE I'D WANT TO TAKE HOME. BUT THE FIRST THING I'D DO WHEN I GOT IT THERE WOULD BE TO PLUG IN A BETTER SOUND CARD. WHEN WILL COMPUTER MANUFACTURERS REALIZE THE IMPORTANCE OF TOP-NOTCH AUDIO? - MB

But still, this system just couldn't crack a "10" rating in the bootVerdict. NEC's original decision to use ATI's 3D Rage graphics accelerator seemed like a fantastic idea when we first heard about it in May; now, we know that chip delivers only mediocre 2D Windows and DOS performance. (It's still better than most 2D/3D hybrid accelerators, but it's nowhere near as powerful as, say, Matrox's MGA Millenium card when it comes to pure 2D performance and application-oriented 3D graphics.)

We reserve our heaviest criticism for NEC's choice of a sound chip. NEC must know that gamers want true wavetable audio, but the Yamaha OPL4 FM/wavetable hybrid on this baby's motherboard ain't foolin' nobody. Yes, Sound Blaster compatibility is assured, but in terms of sound quality, the OPL4 chip is miles away from Creative Labs' AWE32 or Yamaha's WaveForce XG cards. Following Compaq's decision to hobble their ultimate game system, the Presario 8710, with AMD's weak-sounding, semi-Sound Blaster compatible InterWave chipset; NEC's decision stands as yet another example of the low priority these companies place on sound quality. At least the OPL4 offers hardware compatibility. PowerPlayer 2020 is a kick-ass gaming system, but falls just short of being "ultimate." None of its weak links are fatal. If you dread building your own dream, NEC will be happy to share this pleasant one with you.

— Chris Dunphy

Spare Change?

NEC sacrifices speed for convenience with their 6x4 CD-ROM changer, (which is actually manufactured by Nakamichi). The drive mounts as the system's F: drive. Insert four discs into the drive and use the provided utility (in either DOS or Windows) to choose between them. It's handy, but not nearly as fast as any of the 8x drives common in competing 200MHz systems.

+	−
• EVERYTHING IN ONE BOX	• WEAK WAVETABLE AUDIO SOLUTION
• 3DFX VOODOO GRAPHICS ACCELERATOR	• WEAK 2D-GRAPHICS PERFORMANCE
• 6X4 CD-ROM CHANGER	• IR MOUSE IS FLAKY
• THREE-BUTTON MOUSE	
• EXCEPTIONAL SOFTWARE BUNDLE	

under the hood

the brains

CPU.....200MHz Intel Pentium
External Cache ...256K pipeline burst cache
RAM.....32MB EDO DRAM (128MB max)
Video.....ATI 3D Rage 2D/3D accelerator on motherboard (2MB EDO DRAM) Diamond Monster 3D (3Dfx Voodoo Graphics chipset) for Direct3D and Voodoo optimized games (4MB EDO DRAM)

the brawn

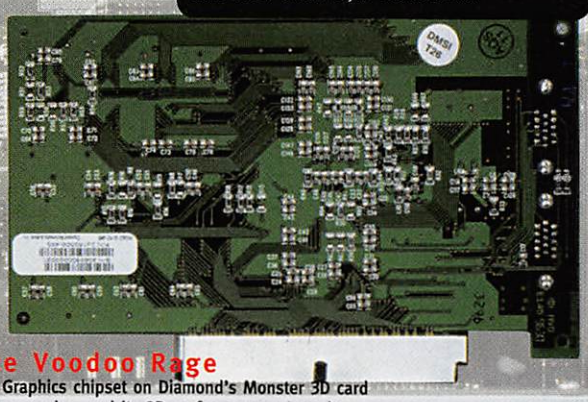
Hard Drive.....3.2GB EIDE IBM DAQA-33240
CD-ROM.....NEC MultiSpin 6x4 (6x, 4-disc changer)
Expansion Bus...3 ISA, 3 PCI, one shared, one of each occupied
Fax/Modem.....33.6Kbps fax/modem with full duplex speakerphone

the beauty

Monitor .....NEC MultiSync XE17
Sound Card.....Yamaha OPL4 FM/wavetable synth (on motherboard)
Speakers .....Advent AV370 system (2 satellites providing 10 watts per channel, plus a 30-watt subwoofer)
Other .....ThrustMaster Mark II FCS joystick; Gravis MultiPort hub with two GrIP gamepads; two USB ports

the goods

NEC has stuffed all the gaming goodies into the PowerPlayer 2020's box.

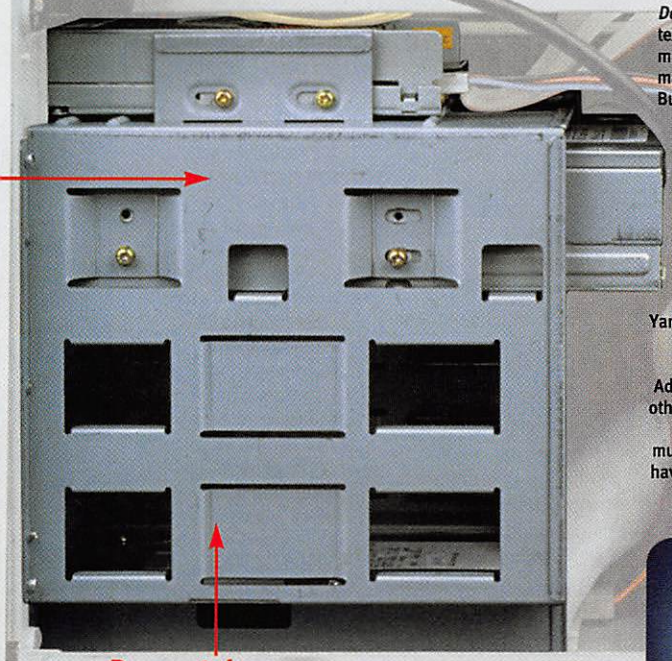


Experience Voodoo Rage

The 3Dfx Voodoo Graphics chipset on Diamond's Monster 3D card is straight from the arcades, and its 3D performance proves it. *Descent II* becomes a whole new game, with smooth, high-res textures zooming all around you. The ATI 3D Rage chip on the motherboard offers less exciting performance, with 2D performance in Windows and DOS that's nothing to get excited about. But you can always plug in your own favorite 2D rocket.

The Beam Team

The PowerPlayer features an IrDA-compliant infrared port for beaming data to and from notebooks and PDAs. You can also use NEC's remote as a mouse, and to control the system's CD player and telephony applications from across the room. Unfortunately, the remote's performance is skittish: it hardly moves at first, then it lurches across the screen.



Baywatch

The chassis has two 5.25-inch drive bays accessible from the front, and one internal 3.5-inch drive bay. The front bays are easy to load. Unfortunately, NEC decided not to provide the interface cables required to hook up any extra drives; a decision that strikes us as bizarre. Adding drives means buying all new cables and reconnecting the existing drives.

Consider the Source

Yamaha's OPL4 is a poor choice for delivering the wavetable sound everyone wants. The Advent AV370 speakers, on the other hand, kick butt. The satellite are small and don't take much desktop space (they even have a mounting bracket on the back). Leave the beefy subwoofer on the floor.

Get a Grip

The three-button Logitech mouse is a nice touch; it shows that NEC really has studied the gaming market. Including a Gravis MultiPort and two GrIP gamepads is also a smart move. The FCS Mark II may not be ThrustMaster's top of the line, but it is an excellent stick nonetheless. A good throttle and perhaps a set of rudder pedals are about the only components missing.

boot verdict

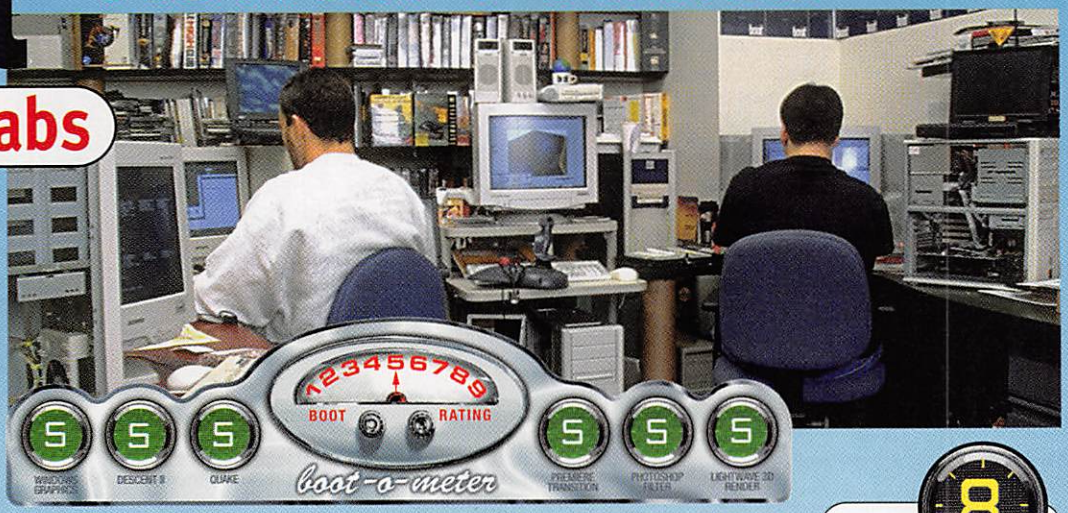
PRICE: $3,299
COMPANY: NEC Technologies
PHONE: 800.632.4636
URL: www.nec.com

A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

S/W

boot Review Policies

labs



boot *isn't like any other computer magazine, and neither is our product* ***evaluation*** *process. We don't test equipment in the cold, sterile environment of a warehouse-sized lab, and we don't write our reviews based on the* ***test scores*** *that lab-coat-wearing technicians scribble on clipboards.*

Our review ***scores*** *are based on a combination of objective* ***benchmark*** *testing, real-world performance, and our* ***subjective*** *evaluation of features, performance, and the many less tangible* ***characteristics*** *that go into a product. All of our evaluations are based on* ***hands-on*** *use of the product.*

boot KICK ASS! PRODUCT

Only the **best** earn enough respect to be worthy of our **editors' choice** award.

The boot-o-meter explained

For our tests, we use Ziff-Davis' WinBench 96 suite of benchmarks to measure CD-ROM and hard-disk drive performance (kilobytes per second), as well as graphics speed under Windows (millions of pixels per second). All systems are tested at 1024x768 resolution with 16-bit color depth. All notebooks are tested at 800x600 resolution with 16-bit color depth (they're also tested at higher resolutions, if higher resolutions are supported). We judge DOS video performance by measuring the number of frames per second that a system is capable of pumping out while playing games such as *Descent II* (at 640x400 resolution) and *Quake* (at 640x480 resolution on desktop systems; 320x480 res on notebooks).

In our real-world tests, we measure how long it takes a system to perform specific tasks: Rendering a video transition in Adobe's *Premiere*, applying a gaussian-blur in *Photoshop*, and rendering a wireframe scene in NewTek's *LightWave 3D*. The performance is guaged on a scale of 1 to 9 in each of these areas, average the scores, and arrive at an overall performance rating. The details of each test (specific frame counts and such) are always available on the *bootNet* Web site at **www.bootnet.com**.

Our performance scales are based on systems that we consider to be among the best in their class, and we change those reference standards every six months. If the system reviewed equals or exceeds the performance of the reference platform (a score of five or better), the boot-o-meter dial is green; if it scores a four, the dial is yellow; and if it scores a three or less, the dial is red.

Our Reference Desktop PC

Gateway's P5-166XL *is our reference desktop computer because it's a workhorse, delivering solid benchmark scores all around. Systems shipped since the P5-166XL—especially 200MHz Pentium systems—should at least match its performance.*

Our Reference Notebook PC

We selected ***Fujitsu's Monte Carlo*** *as our reference notebook because of its excellent benchmark scores. The Monte Carlo's use of more expensive VRAM, instead of the slower DRAM, resulted in exceptional graphics performance.*

The bootVerdict

The fastest computer in the world is useless if it's poorly designed. That's why we evaluate a host of subjective criteria in addition to rigid benchmarks. We look at a machine's overall design, its ergonomics, expandability, ruggedness, and advanced features.

We also carefully consider a manufacturer's component choices, including the quality of the sound card, speakers, modem, keyboard, and mouse. We count expansion slots and drive bays. We take off the case and put it back on. We plug in drives and cards to judge how easy—or difficult—it is to expand the machine. These might seem like minor considerations, but they have an enormous impact on the level of satisfaction a new computer delivers. Our final rating is an amalgam of the objective benchmark ratings and these subjective judgements.

DOUBLE TAKES
GIVE A SECOND EDITOR'S HANDS-ON OPINION OF THE SYSTEM BEING REVIEWED.

H/W

3D Blaster PCI; Reactor; Screamin' 3D

Voodoo competition

Vérité Head-to-Head
(in millions of pixels per second)

Resolution	Color Depth	Refresh Rate	3D Blaster	PCI Reactor	Screamin' 3D
800x600	24-bit	75Hz	13.7	15.1	15.5
1024x768	16-bit	75Hz	17.3	17.4	23.1
1280x1024	8-bit	60Hz	20.4	22.1	26.5

If you're one of the animals still staring into the lights of the oncoming wave of 3D accelerators, now may be the time to move. The second generation of cards is wrapping up with Rendition's Vérité V1000 as the last significant contender.

Creative Labs announced it would use Rendition's chipset in its Blaster PCI card more than six months ago, but recently two unlikely newcomers have also jumped on the Vérité bandwagon.

Software giant Sierra On-Line enters the fray with the Screamin' 3D, and workstation powerhouse Intergraph makes its first foray into the consumer market with the Reactor. All three cards feature the same graphics engine and 4MB of EDO DRAM, so we were surprised by the differences in performance.

The buzz about Vérité has only been matched by that from 3Dfx's Voodoo Graphics chipset; still, the two are very different. Voodoo is specifically a 3D accelerator and requires a second graphics card for 2D; while Vérité does it all: 2D- and 3D-graphics acceleration, video acceleration, plus DOS compatibility. (See boot *03 for reviews of Voodoo-powered cards from Diamond and Orchid.)*

Vérité doesn't rate best-of-class in any one category, but does deliver excellent all-around performance. As a special-purpose CPU optimized for 3D, the Vérité isn't a single-purpose, hard-coded graphics engine like most accelerators. Vérité does much of its own triangle-setup calculations, dramatically reducing the load on the host's CPU and PCI bus. And since it's a processor in its own right, manufacturers who build it into their cards can upload new code to its PROM. This internal code, and external Windows drivers, result in performance differences between otherwise identical products.

When accelerating 3D graphics, all three cards performed identically, but Sierra On-Line's Screamin' 3D is the surprise winner in this face-off because of its superior 2D performance and software bundle.

Between the Voodoo and the Vérité, it's still too early to tell; there aren't benchmarks to base a comparison on. Both generate stunning 3D graphics and smooth frame rates, but the Vérité accelerates apps, that present 3D graphics in a 2D window. — *Chris Dunphy*

Reactor

***IndyCar II* looks fantastic on the Reactor.**

Intergraph tweaked Rendition's reference drivers the least. Scoring a Graphics WinMark 96 of 17.3 million pixels per second, the Reactor tied with the 3D Blaster in terms of Windows graphics acceleration, but lagged significantly behind the Screamin' 3D. The card was a fraction faster than the 3D Blaster playing *Quake*, and a fraction slower than the Screamin' 3D. All three cards delivered the same frame rate playing *Duke Nukem 3D* at 640x480 and 800x600.

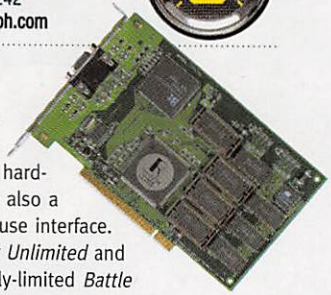
The Reactor comes packaged with the full 3D-accelerated version of *Indy Car Racing II*, the accelerated shareware version of *Quake*, and demo versions of Microsoft's Direct3D games *Monster Truck Madness* and *Hellbender*. Intergraph doesn't include an MPEG player.

boot verdict

PRODUCT: Reactor
PRICE: $199
COMPANY: Intergraph
PHONE: 800.763.0242
URL: www.intergraph.com

8

3D Blaster PCI



Creative Labs customized Vérité's code, making it backward compatible with games written for the CGL API. This enables 3D-accelerated games designed for the first-generation 3D Blaster to run on the new hardware, but most of those games are no longer state of the art. There's also a software MPEG decoder saddled with a cute but nearly impossible-to-use interface.

The 3D Blaster's accelerated bundle includes full versions of *Flight Unlimited* and *Rebel Moon*, a slightly-limited *Battle Arena Toshinden*, and the shareware version of *Quake*.

The 3D Blaster comes with *Battle Arena Toshinden*.

boot verdict

PRODUCT: 3D Blaster PC
PRICE: $199
COMPANY: Creative Labs
PHONE: 800.998.5227
URL: www.creativelabs.com

8

Screamin' 3D

Sierra outsourced Screamin' 3D and device-driver design to Canopus, a Japanese graphics card manufacturer, and focused on 2D performance. The Screamin' 3D delivered a Graphics WinMark 96 score of almost six million pixels per second faster than the other two cards.

In addition to the best 2D performance, Sierra's superior software bundle consists of 3D-accelerated full versions of *Indy Car Racing II*, *Silent Thunder: A10 Tank Killer*, and *Cyber Gladiators*; plus the accelerated shareware version of *Quake*. Sierra does not bundle an MPEG player.

The Screamin' 3D leads the Vérité-powered graphics accelerators.

Sierra's *Cyber Gladiators* on the Screamin' 3D.

boot verdict

PRODUCT: Screamin' 3D
PRICE: $199
COMPANY: Sierra On-Line
PHONE: 206.649.9800
URL: www.sierra.com

9

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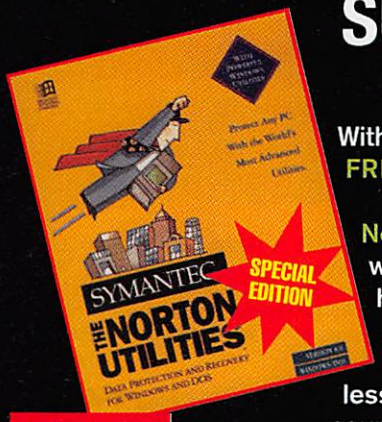

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Fujitsu Monte Carlo

We have a winner

If the Monte Carlo were the perfect notebook PC, it would boast a fast processor; long battery life; a big screen; floppy, CD-ROM, and hard-disk drives—all at the same time—and it would be light as a feather. As it is, the Monte Carlo comes closer to this ideal than anything else that's come through the bootLab. Considering this is Fujitsu's first foray into the North American PC market, it's an R&D coup equivalent to breaking the bank in, well, Monte Carlo!

This machine has a winning design: Its modular floppy drive can be swapped out for a second lithium ion battery—without giving up the 6x CD-ROM drive. The ErgoTrac pointing device combines the best of track pads and pointing sticks. The video chipset delivers up to 800x600 resolution with 65K colors (up to 1024x768 on an external monitor). Overall, the Monte Carlo's video subsystem delivered great benchmark numbers.

Fujitsu includes features you won't appreciate until you use a notebook that doesn't offer them. The thumbwheel volume control and analog brightness slider, for example, allow you to make adjustments without studying the keyboard. A four-inch LCD panel delivers information about battery life, disk access, and other conditions even when the lid is closed. There are PS/2-style ports for a mouse *and* a keyboard. It even sports a joystick/MIDI port.

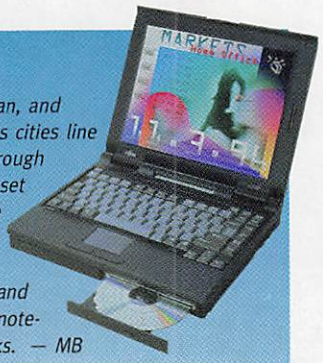
Despite our praise for the Monte Carlo, it lacks a few key features. Fujitsu anticipated some of these criticisms and is designing them into its next generation of notebooks. (See the sidebar "But I'm Not Dead Yet!") High on *our* wish list is support for a docking station—or at least a port replicator.

A lesser flaw concerns the Monte Carlo's feet, which tend to collapse when you lift the front of the unit. When they're up and you open the CD-ROM drive, it scrapes along your desk. It's not bad enough to prevent the drawer from opening, just enough to make you worry about bending the rails out of alignment. (Fujitsu recommends the drive only be opened when the feet are tucked away—nonsense.)

The Monte Carlo's benchmark performance, peripheral integration, and unique features add up to a compelling package. Although the machine tips the scales at more than seven pounds, the carrying weight increases by only one pound when you include the power brick. The absence of a docking-station port will be a drawback to some, but Fujitsu makes it easy to gamble on the newcomer.

— *Bryan Del Rizzo*

But I'm Not Dead Yet!



Even as Fujitsu is beginning to ship its Montego, Milan, and Monte Carlo notebooks, it's already killing the famous cities line in favor of a whole new Lifebook series that went through R&D almost concurrently. The Lifebook's design was set in concrete even before the first line shipped, but we were surprised to discover that some of our favorite features are being dropped.

Here's a summary of the features to be added—and dropped—from Fujitsu's new LifeBook 500 series of notebooks and LifeBook 600 series of ultralight notebooks. — MB

Added	Dropped
Pentiums up to 150MHz	LCD viewable when case is closed
Docking station support	Second PS/2-style device port
Zoomed Video Port support	Joystick port (only from the 500 series)
Can replace floppy w/second HD	ErgoTrac pointing device

DOUBLE TAKE

THE MONTE CARLO IS LOADED WITH INNOVATION, SUCH AS ITS ALWAYS-VISIBLE LCD AND ERGOTRAC POINTING DEVICE. THE MACHINE IS SLIGHTLY HEAVIER THAN SOME, BUT I'D TRADE A LITTLE WEIGHT FOR PERFORMANCE ANY DAY. - MB

'Round Back

The Monte Carlo is equipped with parallel, serial, and VGA ports. An IrDA-compliant infrared port is mounted above them. The small fan on the back is amazingly quiet. Having two separate PS/2-style ports (one for a keyboard and one for a mouse) is mighty handy, but a connector for a docking station would have been even better.

Locked Tight

The Monte Carlo supports two Type II PC cards or one Type III card. Each card can be locked into place using this sliding tab. The machine doesn't support a Zoomed Video port, but Fujitsu does bundle a software MPEG decoder.

Note: Reference Standard

The Monte Carlo's score of straight fives reflects our decision to use this machine as our benchmark notebook.

A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

under the hood

the brains

CPU.....120MHz Intel Pentium
ExternalCache.....256K pipeline burst
RAM.....16MB EDO DRAM (48MB max)
Video.....Cirrus Logic CL-7548, 2MB VRAM

the brawn

Hard Drive.....1 Fujitsu 1CGB EIDE
CD-ROM drive.....6x Matsushita IDE-ATAPI
Expansion 2 Type II PC Card or 1 Type III
Lap Weight.....7 pounds, 4 ounces
Travel Weight.....8 pounds, 7 ounces

the beauty

Display.....11.3-inch active matrix
Video.....800x600 max res, 65K colors (1024x768 on external display)
Sound.....ESS Technology ESS 1688 FM synth
Speakers.....Stereo speakers, headphone jack
Communications..IrDA-compliant infrared port

the goods

Fujitsu understands. Power users need both a floppy and a CD-ROM drive. The option to swap the floppy for a second battery is sweet.

I see...

This unique LCD is visible even when the lid is closed. It displays icons for power and battery status (one for each battery, if two are installed); disk, CD-ROM, and PCMCIA card access; and other information.

Showoff

The sturdy lid housing the small 11.3-inch active-matrix display exhibits minimal flex. (The 133MHz Monte Carlo comes with a 12.1-inch screen.) The Cirrus Logic graphics chipset, supported by 2MB of VRAM, produces up to 65K colors, but the display can handle a max resolution of only 800x600 (the chipset can drive an external monitor at up to 1024x768). The slider on the right side of the display adjusts brightness.

+	–
•Floppy and CD-ROM drive-simultaneously •LCD panel visible when case is closed •Joystick/MIDI port •PS/2 ports for mouse and keyboard •2MB VRAM •ErgoTrac pointing device •Analog controls for brightness and volume	•No docking station port •Display doesn't support 1024x768 •No support for Zoomed Video port •Modem not included

Point the Way

Fujitsu's unique ErgoTrac pointing device combines the precision of a pointing stick with the comfort of a track pad. The 82-key keyboard, with an extra-wide backspace key, is arranged in a standard layout and offers excellent tactile feedback. Expect a little more than two hours of life from the lithium ion battery, but swapping out the floppy drive for a second battery doubles the time you can spend away from AC.

boot verdict

PRICE: $3,699
COMPANY: Fujitsu PC
PHONE: 888.466.8434
URL: www.fujitsu-pc.com

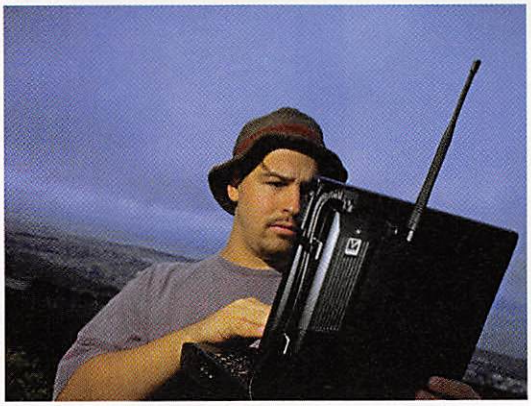
S/W

Ricochet Wireless Modem

Nothin' but Net

Wireless Web surfing is the next big thing. Try it for a week, and you'll be convinced. If you happen to live in the right spots, Metricom's Ricochet wireless modem can give you a taste of the future now, and at a fairly reasonable price.

Unlike cellular modems that max out at about 9.6Kbps and charge by the minute, Ricochet modems perform more like conventional modems and deliver unlimited usage for a flat monthly rate. The raw data rate between Ricochet transceivers is 100Kbps, but after accounting for overhead and latency, the practical speed limit ranges from 14.4Kbps to 28.8Kbps. Our tests in the San Francisco Bay Area resulted in speeds ranging from 2.4Kbps to beyond 28.8Kbps. We had mixed results trying to remain connected while driving. Sometimes it worked great, sometimes we lost our connection in midsession. Metricom is improving its routing to function better with Ricochets in motion. We also discovered that the modem's performance depends a lot on the application you are running—for instance, sometimes ftp crawls while *Cu-SeeMe* runs fine.

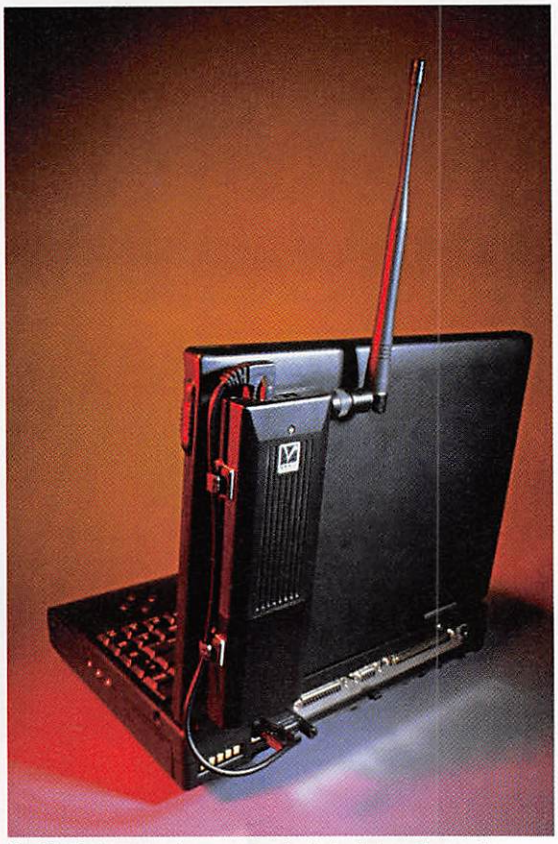


With the Ricochet you can e-mail from bed, or surf from the top of the world.

Metricom has wired most of the San Francisco Bay Area and Seattle, and will be moving into Washington D.C., 10 to 12 major airports, and some hotels by the end of 1996. The company plans to roll out national and even international service eventually; and is hoping to partner with other companies to achieve these goals.

The flat-rate pricing structure means Ricochet service costs little more than a second phone line and the cost of an ISP.

— Chris Dunphy



The Ricochet appears to your computer to be just another modem speaking PPP. It doesn't need any special software.

boot verdict

PRICE: $29.95 per month for e-mail account and unlimited Internet access. Modem rental $10 per month
COMPANY: Metricom
PHONE: 800.556.6123
URL: www.metricom.com

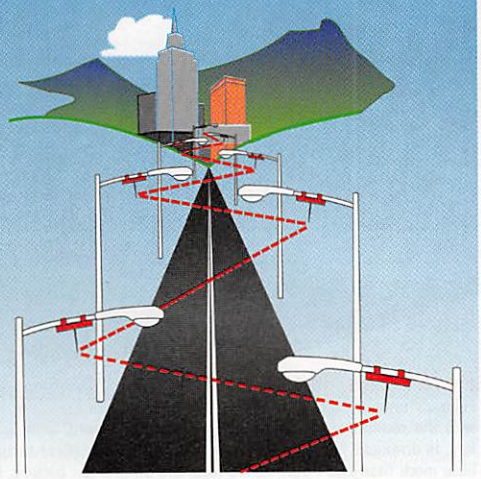
Internet Ping-Pong

The Ricochet works with any device equipped with a serial port (notebooks and PDAs, for example). The service uses a spread-spectrum, frequency-hopping transmission system that transmits data packets on randomly selected channels throughout the license-free 902MHz to 928MHz band of the radio spectrum—the same range that garage door openers and your better cordless phones use.

Because it's constantly switching channels, the Ricochet quickly skips over any interference, and it's nearly impossible to eavesdrop on the data traffic. (If you're really paranoid, you can configure the modem to do end-to-end encryption as well.)

Each transceiver in the network transmits at only one watt, which gives them an advertised range of just one quarter mile. Metricom deploys tiny repeater modules on street lights and buildings in a mesh pattern throughout its coverage areas. Every radio can talk to its neighbors, and ideally, every notebook-mounted Ricochet is within range of two or more repeaters. Data packets are then bounced from repeater to repeater, until eventually a wired access point is reached. At this stage, the signals are transmitted over T1 lines to Metricom's central office, and from there to the Internet.

Latency degrades performance, and multiple radio hops can add a lot of it. Chatty protocols that need frequent acknowledgment of sent packets (such as many games played over the Net) suffer a great deal. Applications that stream data without waiting for a response, such as *Internet Phone*, on the other hand, do very well.



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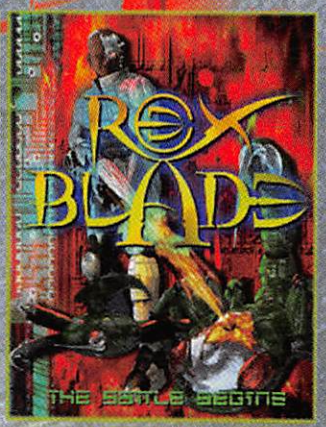

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H/W

Gateway Destination G5-166

Like a glass eye on the world

The Destination makes a great *second* computer. With its massive 31-inch monitor, this box makes the perfect living room game machine, reference library, and Web surfer. With a 166MHz Pentium, 256K of pipeline burst cache, 32MB of memory, and a cordless keyboard, the CPU is equipped to handle just about any application.

But note the emphasis on *second* computer. The Destination's greatest asset—its monstrous monitor—is also its Achilles heel. Any monitor worth a damn has a dot pitch no greater than 0.28mm, is capable of resolutions of at least 1280x1024, and offers a vertical refresh rate of 82Hz or higher, right? Any monitor worth a damn features etched glass and anti-glare coating, to reduce reflectivity; and a flat, square tube, to reduce visual distortion, right? All of these specifications are critical for the healthy use of a computer for word processing, spreadsheets, image processing, CAD, Web page design, and other applications, right? The problem is that you wouldn't want to use the Destination for any of these activities—at least, not for very long—because it fails to live up to any of those specifications. It's a glorified television monitor.

A person with 20/20 eyesight can comfortably read text from a CD-ROM encyclopedia at six to eight feet on the Destination's monitor (any further, and things get fuzzy). You can surf most Web pages from the comfort of your couch. And you can play games. Boy, can you play games.

Even on a 17-inch monitor, games feel as though you're looking through a small portal into another world. On the Destination, you feel as though you've been sucked into that world. *Quake*'s Shambler looks as if it's going to bust right through the glass and grab you by the throat. The wise-ass trivia game *You Don't Know Jack* turns your house into a game-show studio. And *Descent II* will have you reaching for the air-sickness bag in the seat pocket in front of you—especially if someone else is at the controls.

But games are only part of a computer's job. The Destination is not at all adept at *creative* applications. Its wireless keyboard and track pad aren't precise enough for painting or drawing (selecting a precise word in a text document can be a challenge); and you wouldn't want to write, or even read, reams of pages while gazing into that mirror-like monitor.

But when you see a Destination, that 31-inch monitor issues a siren's song that's awfully hard to resist; especially when it's playing through the optional Harmon/Kardon home-theater audio system. It's enough to make you say, "To hell with everybody else in the house, I'm taking over the living room, too!"

— *Michael Brown*

DOUBLE TAKE

WITHOUT A DOUBT, THE 31-INCH MONITOR IS THE DESTINATION'S SELLING POINT. I'M OK WITH ITS HIGH DOT PITCH AND LOW RESOLUTION (ESPECIALLY WHEN VIEWED FROM A DISTANCE), BUT IT'S GLASSY LIKE A MIRROR!

-BD.

Remote Control

The Remote Mouse features a marble-sized trackball that's easier to use than the touch pad for many applications. In addition to the left and right mouse buttons on the top of the remote, there's a third on the bottom that functions as a second left mouse button. You can also use the remote to change channels on the TV tuner, change the volume, and so on. Like the keyboard, it transmits using radio frequencies, not infrared.

Sound System

The heart of this $699 package is an H/K AVR10 A/V receiver equipped with a Dolby Pro-Logic decoder. The receiver offers inputs and outputs for two VCRs and one cassette deck, plus inputs for a CD player and a TV tuner or auxiliary device. In stereo mode, the receiver delivers 35 watts per channel continuous average power with less than .09 percent total harmonic distortion. In five-channel surround mode, it puts out 30 watts per channel to the front (left, right, and center) with less than 0.3 percent THD; and 20 watts to the rear (left and right) with less than 1.0 percent THD.

A full complement of speakers comes with the audio package, consisting of front, rear, and center speakers, plus a powered subwoofer. Gateway even provides heavy speaker wire in bulk. Playing games through this system—particularly the Nine Inch Nails soundtrack in *Quake* and the Dolby Pro-Logic soundtrack in *Wing Commander IV* is nothing short of spectacular.

A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

under the hood

the brains

CPU	166MHz Intel Pentium
External Cache	256K pipeline burst cache
RAM	32MB SDRAM (64MB max) (System tested was equipped with 16MB)
Video	STB Video Rage (Brooktree Mediastream chipset, 2MB VRAM, onboard TV tuner)

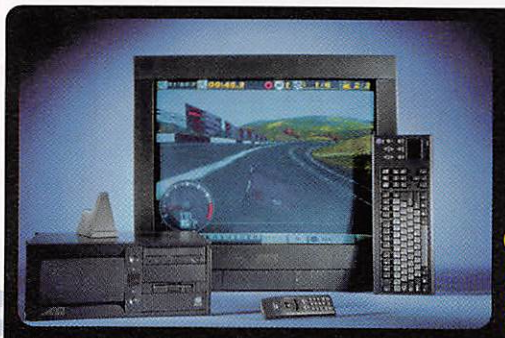
the brawn

Hard Drive	2.5GB EIDE Western Digital AC32500
CD-ROM	Toshiba 8x IDE-ATAPI
Expansion Bus	4 full-length PCI, 3 full-length ISA
Fax/Modem	33.6Kbps Gateway TelePath

the beauty

Monitor	31-inch Mag Innovision DL31-1 (Invar shadow mask)
Sound Card	Ensoniq Soundscape VIVO 90 (1MB sounds in ROM)
Video	800x600 max res, 65K colors
Speakers	Harmon/Kardon AVR10 Dolby Pro-Logic receiver with five speakers plus powered subwoofer

the goods



The Destination is the ultimate computer for couch potatoes. The massive 31-inch monitor is a sight to behold and will fill your living room.

Tiger in the Tank

Aside from the flat-back case, the Destination G5-166 doesn't look radically different from any of Gateway's other computers. The Intel Tiger Eye motherboard features a model 430VX core-logic chipset, 166MHz Pentium, 256K of pipeline burst cache, and seven expansion slots (four PCI, three ISA). There are four SIMM slots, two of which are occupied to deliver 32MB of SDRAM, but the system is expandable to only 64MB. All the components and drives are easily accessible, and there's plenty of room for growth.

Not to be Confused with the 3D Rage

Video is handled by a 32-bit STB Video Rage card, with a Brooktree Mediastream chipset and 2MB of VRAM. The card has a cable-ready TV tuner onboard, with a coaxial connector on the mounting bracket for antenna or CATV connections. There's also an RCA video-in jack and an S-video-in jack, so you can display other video sources (such as a laser disc player and a VCR) on the Destination's monitor. The only video input on the monitor is a VGA connector.

+	–
• 31-inch monitor • Integrated TV tuner • 2MB VRAM delivers great game perfor mance • Awesome sound system • Cordless keyboard	• Monitor has low-res specs • Video res limited to 800x600; optimal at only 640x480 • Sound Blaster compatibility achieved in software • Mediocre CD-ROM drive performance

Touch Me

The wireless battery-powered keyboard transmits using RF in the 900MHz range, so there are none of the line-of-sight requirements imposed by infrared devices. The integrated touch pad is much handier than a mouse, but it doesn't feel nearly as precise or as well made as the touch pads on most notebooks. The buttons above the touch pad control the TV tuner (the power button is for the TV, not the computer), and the Resume button "wakes" the touch pad.

boot verdict

PRICE: $3,299 (plus $699 for optional audio system)

COMPANY: Gateway 2000
PHONE: 800.846.2000
URL: www.gw2k.com

8

H/W

Panasonic CF-62

A sure-fire way to join the mile-high club

There's one reason to buy a Panasonic CF-62 notebook—and it's not the 133MHz Pentium at its core. Punch the eject button and you set into motion an intricate set of gears and motors that elevates the keyboard, exposing a PD/CD drive. Capable of reading CDs at 4x speed, and reading and *writing* 5.25-inch 650MB PD cartridges, the mechanism offers an infinite amount of storage. And the sight of a tray emerging from the bowels of the CF-62, seizing a disc, then withdrawing to its lair never fails to wow an audience.

This computer is definitely unique. It's so self-contained that you can back up its entire hard drive onto one or two cartridges, wherever you happen to be. Store all your work on a cartridge and keep it in your pocket, and you eliminate the risk of losing valuable data if the computer is stolen while you're on the road. In fact, the CF-62's hard disk, floppy drive, and battery are also removable, but you'll need fingers of steel to pry them out of their bays. And you must remove the floppy drive in order to release the hard drive.

Panasonic's engineers haven't made ergonomics a priority. The 1.75-inch deck on this box left deep indentations in my wrists after a few hours of typing. Tipping the scales at a shoulder-wrenching 9.3 pounds, this beast will exact a heavy toll on your physique if you carry it for long.

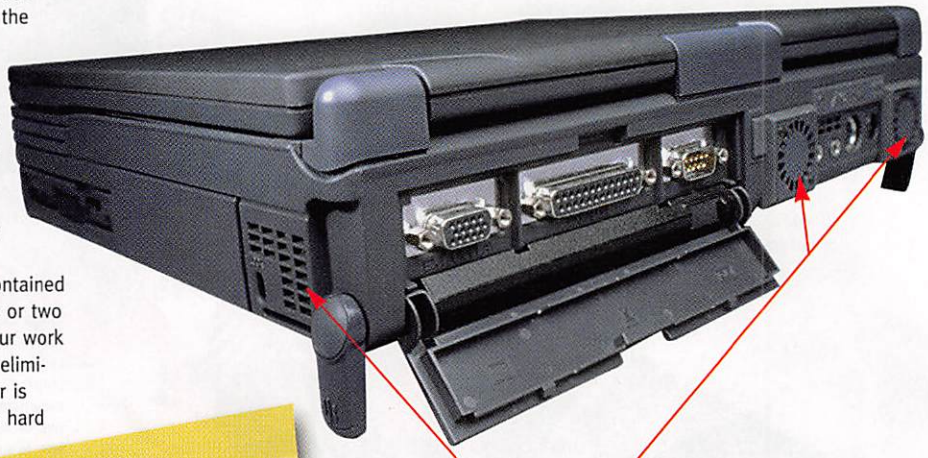
For all its heavy armament, the CF-62 is a mixed bag in terms of performance. The 1.35GB Seagate hard drive delivered a decent Disk WinMark 96 score of 688K/sec, but its Chips & Technologies HiQV64 video chipset pumped out only 9.13 million pixels per second on the Graphics WinMark 96 test at 800x600 resolution and 16-bit color depth. (That number dropped to 5.5 million pixels per second with video set to 1024x768.)

The CF-62 is a niche product, but it fills its niche exceptionally well. If you're a road warrior in need of massive amounts of secure storage, or even if you just like to show off, this is the perfect alternative to packing a stand-alone removable-media drive and a second power supply.

— *Michael Brown*

Port City

The back panel offers all the ports you'd expect, including an IrDA-compliant infrared transceiver. The headphone jack would be more useful placed on the side of the machine, and it would have left room for a second audio jack. Since there's only one, it must be configured in software to function as either a line-in (for a mic) or line-out (for speakers). There's a docking-station port on the bottom of the machine.



Keep Cool

It's not uncommon to find a cooling fan on a notebook, but the CF-62 is outfitted with *three*. The box makes so much noise it sounds like there's a Hovercraft idling in front of you. If it wasn't so heavy, it might form a cushion of air and glide right off your desk.

DOUBLE TAKE

When I saw the Panasonic CF-62 bristling with gadgets and levers, I figured it must include everything but the kitchen sink. When I saw the water-spigot symbol displayed in the LCD panel, I thought maybe the sink was in there after all. But no, that just depicts battery consumption. This notebook has it all, and the heft to prove it. It's an excellent mobile office, but at almost 10 pounds, I wouldn't want it in my backpack all day.

– CD

How PD Works

A PD drive (Phase-change Dual) uses a laser to create a pattern of dark and light spots on a PD disc. The laser changes the reflectivity of a tiny area of the disc from high to low to record—and back again to erase. Unlike other rewritable optical storage formats, such as MO, a PD drive can also read conventional CD-ROMs. The 5.25-inch media is encased in a plastic cartridge and is capable of storing 650MB. Cartridges cost about $70 each.

A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

under the hood

the brains

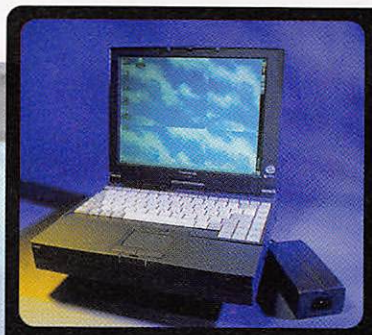
CPU	133MHz Pentium
External Cache	256K pipeline burst
RAM	16MB EDO DRAM (expandable to 80MB)
Video	Chips & Technologies HiQV64 with 2MB DRAM

the brawn

Hard Drive	Seagate 1.35GB EIDE
PD drive	Matsushita 650MB PD/4x CD
Lap Weight	9.3 pounds
Travel weight	10.7 pounds

the beauty

Display	12.1-inch active matrix
Video	1024x768 max res with 65,000 colors
Sound	ESS Technology ESS1888 FM synth
Speakers	Stereo, plus headphone
IrDA	Compliant Infrared



the goods

Panasonic's CF-62 is like a battle tank. Its rugged design and high-tech storage aren't built for speed.

Death of a Pixel

Panasonic shaved a few ounces off the CF-62 by encasing its 12.1-inch active-matrix display in a magnesium-alloy frame. The lightweight metal is impervious to flex, making it a wonderfully strong lid. On a different note, you'll want to carefully examine the unit you intend to buy; Panasonic's QA inspection requires only that there not be too many dead pixels in any one area of the screen—the unit we reviewed had six scattered about.

Iconography

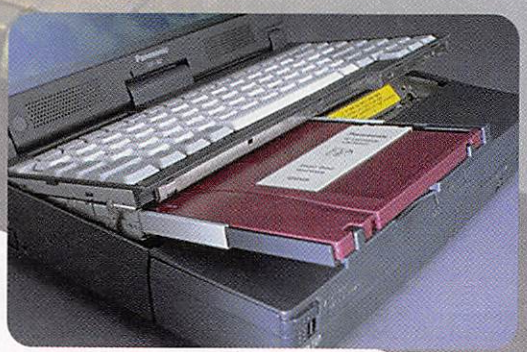
The *CF-62*'s LCD tells all, with a clever icon for everything you can think of.

Loud and Clear

Panasonic wisely avoided the trend toward mounting notebook computer speakers into the wrist rest. With the speakers mounted just below the display, sound is projected out toward your ears, instead of being muffled by your wrists. The ESS Technology ESS1888 FM synth sounds OK, but even a low-end wavetable synth would sound so much better.

Catch the Elevator

There's nothing like the CF-62's hideaway PD/CD drive. It reads CDs at 4x speed, and writes to 650MB rewritable PD cartridges. Using the bundled Seagate backup utility, you can back up the entire hard drive on two cartridges (requiring 78 minutes to back up 605MB of data.) The battery delivered a solid two hours of life with constant use of all components except the PD drive. Copying a 50MB file from the hard disk to the PD cartridge three times in a row consumed about 10 percent of the battery's life, so you'll want to use it sparingly when you're off the power grid.



+	−
•650MB PD drive •All media is removable •Docking-station port •Excellent power management and battery status tools	•Slow for a 133MHz Pentium •Heavy •Clunky design

boot verdict

PRICE: $5,399
COMPANY: Panasonic Personal Computer

PHONE: 800.662.3537
URL: panasonic.com/PCSC/PPCC/PPCC.html

7

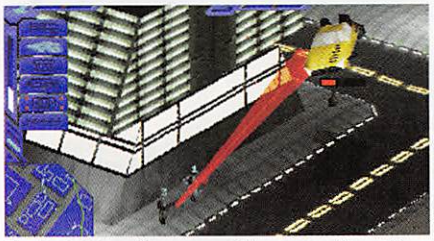
boot disc Try it out! demo on the bootDisc

Syndicate Wars

Is that a gun in your pocket?

Syndicate Wars, the long-awaited sequel to Bullfrog's *Syndicate*, retains the core dynamics of the original smash hit while adding a compelling new storyline, characters, enhanced graphics, and complex missions.

It's been 95 years since the original *Syndicate* took place. EuroCorp now controls Europe, thanks to the microchips embedded in our brains, so things are pretty peaceful. But a mental enhancement technologies experiment has gone awry, and alternate Syndicate factions have emerged intent on overthrowing EuroCorp, and ruling the world!



***Syndicate Wars* offers some wild camera action, with a variety of points of view.**

Playing as either the EuroCorp Syndicate or the Church of the New Epoch, each faction controls special agents, disgruntled scientists, and trigger-happy mercenaries.

Destroying buildings, rescuing captured agents, and assassinations of heads of state may appear routine, but missions must be methodically thought-out and surreptitiously executed. The AI is extremely realistic.

Syndicate Wars' drastically improved 3D graphics show a very dark world, and the atmosphere is reminiscent of *Blade Runner*. The scrolling landscape is smoothly rendered, but some of the 3D buildings and overall darkness make traversing the city somewhat frustrating and difficult.

The interface is intuitive and easy to use. You navigate via the main display panel, which shows real-time action in your mission area; and use your scanner to view the surrounding area, and chart your tactical advances. Control team members and steal or use vehicles simply by clicking a mouse button.

The game's 3D graphics are awesome, imbuing the game with a compelling sense of realism.

Syndicate Wars ran fine under DOS and Win95. Gameplay was fast and furious; the accompanying sound effects and eerie music contributing to the overall mood of the game; the screams of the people you kill and threaten sounding almost *too* realistic.

Up to four people can play simultaneously (each controlling one team member), but *Syndicate Wars* also supports modem and network play (with 15 extra levels). — *Brad Craig*

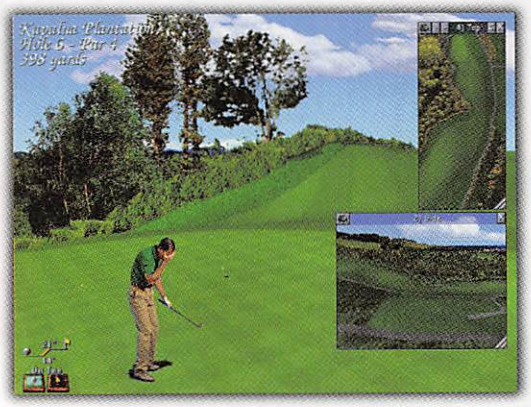
boot verdict

PRICE: $39.95
COMPANY: Electronic Arts
PHONE: 800.245.4525
URL: www.ea.com

NEW LINKS LS: TOUR WITH THE LEGENDS IN SPORTS

What's New About Links LS? Every Leaf, Every Contour, Every Chirp...

...Up to 16.7 Million Colors– New Links LS has unlimited screen resolutions and up to 16.7 million colors—resolution independent means that Links LS can match any monitor's maximum viewing capabilities (even 1600x1200 and higher) and up to 16.7 million colors means the finest in color quality possible. You've simply never seen any golf simulation software this good!

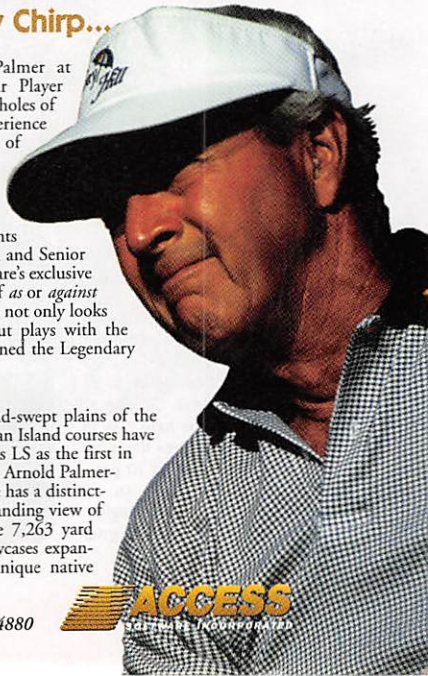


Features include new Post-Shot Reactions and Multiple Views!

...The Most Realistic Golf Simulation EVER– The totally new terrain rendering engine and ball flight give Links LS a realism never before achieved in the gaming industry. As Links has always done, we render not just the hole itself but the entire course and more—you literally can hit your ball a half-mile out of bounds! Now, authentic ground, sand, and grass textures combine with dynamic shadows and fog, to give you a course so lifelike you can almost feel the wet grass! Our engineers have reworked the ball dynamics giving you true-to-life ball flight. Fade your drive just like the pros or watch as your high arching wedge shot actually backs up on the green.

...Arnold Palmer– Arnold Palmer at Latrobe—the first in our Tour Player Series, delivers far more than 18 holes of golf. The Arnold Palmer experience includes a virtual reality tour of Arnie's workshop, office and trophy room. Roam freely in 360 degrees and examine the tools of the trade behind the legend. Listen to Mr. Palmer give insights and recollections about his PGA and Senior PGA tours through Access Software's exclusive multimedia footage. Then tee off *as* or *against* the digitized Arnold Palmer, who not only looks & sounds exactly like Arnie, but plays with the same style and tenacity that defined the Legendary Grand Master of Golf

...Kapalua– Resting on the wind-swept plains of the Golf Coast, two glorious Hawaiian Island courses have been selected to inaugurate Links LS as the first in the series of Resort Courses. The Arnold Palmer-designed Kapalua Village Course has a distinctly European flavor and a commanding view of the West Maui mountains. The 7,263 yard Kapalua Plantation Course showcases expansive slopes, deep valleys and unique native vegetation.



For more info, call 1-800-800-4880

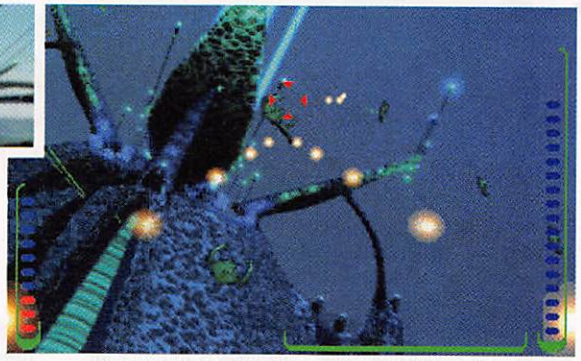
ACCESS SOFTWARE INCORPORATED

S/W

Deadly Tide

Water World *all over again*

On July 2, they arrive.



Deadly Tide is definitely a worthwhile experience, but the limited gameplay makes the experience hollow.

While playtesting *Deadly Tide*, I could feel people watching over my shoulder. "What is this? Are you underwater?" Yes, the game takes place entirely underwater. Alien invaders have come to Earth to set up a mobile home park at the bottom of the ocean and mine a mysterious mineral. Meanwhile, the planet's water level is increasing. Earthlings either have to grow gills or kick some butt.

"Are you in a jet or something?" Actually I fly a HydroFighter, but right now I'm on foot. "How can you sprint underwater?" Uhh... I never thought about that. *Deadly Tide* is so incredibly cinematic that you don't notice silly idiosyncrasies while playing.

It's important to note that the evil invading aliens are ugly, too.

"Is this one of those interactive movies?" Yes and no. This is a big summer blockbuster of a game with gorgeously rendered special effects and CD-quality sound, but everything is rendered, so it's *not* an FMV. It does, however, have great camera work; the video sequences are interwoven with gameplay through changing camera angles, shifting the viewpoint between first to third person and back. Even more incredible is how smoothly the camera pans and that the game graphics are of the same high quality as the cut scenes.

"How do you control where you're going?" You don't. Like any big cinematic experience you're pretty much along for the ride. Occasionally you're given a choice of which way to go, but other than that there's a lot of pointing and shooting while the game runs its predetermined path. While *Deadly Tide* is pretty, hardcore gamers will find the gameplay all washed up.

"Is that it?" It took me two hours to finish the game, the same length as your average movie. When I turned around everyone was gone, and I forgot to check their ticket stubs.

— *Sean Downey*

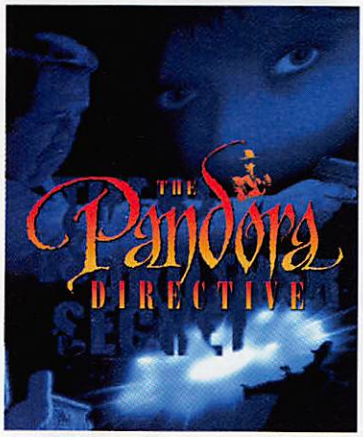
boot verdict

PRICE: $79.95
COMPANY: Microsoft
PHONE: 800.426.9400
URL: www.microsoft.com

2 LEVELS OF PLAY
3 NARRATIVE PATHS
7 DIFFERENT ENDINGS
THE Pandora DIRECTIVE
23 UNIQUE CHARACTERS
58 PLAYABLE ROOMS
360 DEGREES OF FREEDOM

THE PANDORA DIRECTIVE: PLAY IT AGAIN, AND AGAIN...

Tex Murphy returns in the most replayable interactive movie ever made!



An Enormous Six-CD Cinematic Epic!

The Story– What is the truth behind the rumored UFO crash at Roswell, New Mexico? Why did the military suddenly shut down and seal off the Roswell complex? And why the frequent references to the lost Mayan civilization? It starts out like a hundred other cases. $500 a day (plus expenses) to track down a missing person. As you pick up Thomas Malloy's trail, you realize you're not the only one looking for him. By the time you discover that he's ex-military and knows what really happened on July 6, 1947, it's too late. The government's biggest secret is loose and you're trapped in a deadly game of cat and mouse with the most powerful and ruthless agency in the world. Based on the novel by Aaron Conners.

The Features– The most replayability of any interactive movie to date! Follow one of *three* narrative paths leading to *seven* different endings. Choose between *two* levels of play. The first level offers a complete on-line hint system to help you through the tougher puzzles. The second level—for expert gamers—has no hints available, but rewards players with higher bonus points, extra puzzles and locations. Our unique "Virtual World" engine allows you to slip under desks, rifle through drawers, and see the flies tanning in the light fixtures. Without the restrictions of rendered paths, you can explore Tex's three-dimensional world with full freedom of movement.

The Cast– Enjoy the difference Hollywood cinematography, acting, editing, stunt work, music, and direction make as the world of Tex Murphy becomes amazingly real. Starring Barry Corbin (*Northern Exposure, War Games*), Tanya Roberts (*View to a Kill, Beastmaster*), Kevin McCarthy (*Invasion of the Body Snatchers, Just Cause*), and Chris Jones (*Under a Killing Moon, Martian Memorandum, Mean Streets*) as Tex Murphy. Directed by Adrian Carr (*Quigly Down Under, Man from Snowy River, The Power Rangers*). Original music by Richie Havens and Nicole Tindall.

For more info, call 1-800-800-4880

ACCESS SOFTWARE INCORPORATED

Product Information Number 80

H/W

BeBox Dual603-133

And now for something completely different

The Mac is in terminal condition, IBM has put OS/2 on life support, and the Amiga is dead and buried. Based on these facts, you'd have to be crazy to introduce an entirely new platform with an entirely new operating system. Well, the folks at Be might be crazy, but they believe the only way to truly advance personal computers is to throw off the shackles of the past.

If you're a hacker at heart, the type of person who creates gadgets from scratch because prefab tools just don't cut it, you'll be interested in Be's second offering, the BeBox Dual603-133. Powered by two 133MHz PowerPC 603e processors, the Dual603-133 packs more power than any other machine that aspires to be a "personal" computer. Of course, the BeBox has a huge downside, too: It's totally incompatible with anything else, which means there's no software library to speak of.

The people at Be are nonplussed by this. They contend that mainstream operating systems have become slow, bloated, and unstable; weighed down by needless layers of complexity. These behemoth OSs stifle programmer creativity with demands for backward compatibility, creating a vicious circle that demands ever faster hardware to maintain even the same level of performance.

Whether driven by economic necessity or simple wisdom, Be has embraced legacy hardware with the same gusto that they've rejected software compatibility. All parts are off the shelf. And with a plethora of standard PCI and ISA slots, cheap add-on hardware is just a driver away. This guarantees the Dual603-133 will be able to take advantage of whatever spare parts you have lying around.

If you're interested in being a pioneer, the Dual603-133 is for you. But remember, this isn't a mainstream computer—it's not even a general purpose box—and a pioneer's life can be harsh. You'll need to develop your own applications while coping with the rough edges of a newborn OS.

— Chris Dunphy

under the hood

the brains

CPU.....Dual PowerPC 603e's at 133MHz
RAM.....16 MB (Max 1GB)
Video.....ExpertColor Trio64 w/ 2MB

the brawn

Hard Drive.....2 GB Seagate SCSI
CD-ROM.....TEAC 6x SCSI
Expansion Bus.....3 full-length PCI, 5 full length ISA
Network.....Generic ISA Ethernet with 10BaseT and 10Base2 ports

the beauty

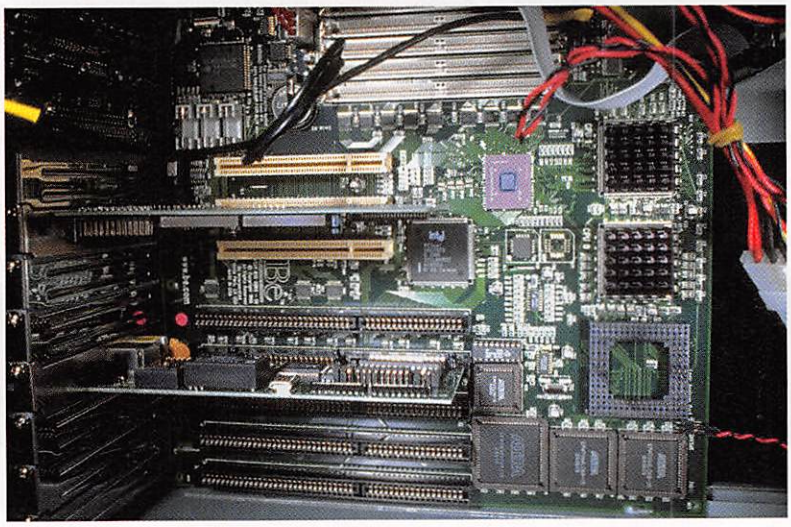
Sound.....16-bit stereo digital sound, two pairs of MIDI ports
Other.....3 IR ports, Geekport

SIMMs to Me

There are eight 72-pin SIMM slots provided. Memory must be 60ns or faster and added in matching pairs. SIMM sizes ranging from 2MB to 128MB are supported, and every pair can be of a different size. Populate all the sockets with 128MB SIMMS and you'll have a gigabyte of RAM onboard! The Dual603-133 comes with a pair of 8MB SIMMS.

Double Trouble

The BeOS is designed to support up to eight PowerPC processors, though the Dual603-133 offers only two. The PowerPC 603e has separate 16K data and instruction caches onboard. Compared to a Pentium running at an equivalent clock speed, the chip offers significantly faster floating-point performance and roughly equivalent integer performance. Two of them running at 133MHz deliver enough horsepower to outrun anything else in the Dual603-133's price range. Unfortunately, the CPUs are soldered to the motherboard, which means processor upgrades require a motherboard swap.



The BeOS

Currently at dr8 (developer release 8), the BeOS is the heart and soul of the Dual603-133.

The BeOS is a true multitasking, multithreaded, symmetric multiprocessing, object-oriented operating system optimized for providing real time interactions with streaming media-rich content. Applications run in protected memory space and (ideally) do not interfere with each other or bring the whole system down. Shared libraries are supported, and device drivers can be loaded and unloaded dynamically.

The user interface is primarily graphical with a text-based shell (based on the Bash shell from Unix) closely integrated for doing down and dirty work. There is a database built into the operating system that provides for a lot of interesting possibilities, an example would be: setting up a query to display a folder listing every file on your hard disk ending in ".gif" that is more than 50K—this folder would then be automatically and dynamically updated as the contents of your hard disk changed.

The native language of the BeBox is C++, and the BeOS comes with a demo version of Metrowerks' *CodeWarrior* development environment. (The demo only allows you to build applications smaller than 64K.) Posix libraries are provided to ease porting generic C++ and Unix applications. Metrowerks is currently extending the Be version of *CodeWarrior* to support Java, and is working with Be to integrate Java into the operating system itself.

In the BeOS, every Window has its own thread to deal with display issues without interrupting the application. This allows movies in dragged windows to continue playing throughout the move, for example. Be has recently released a standard OS API called the 3D Kit that works like Microsoft's Direct3D. Combined with the Game Kit that provides a standard interface to input devices, the BeOS has the potential to be a 3D gaming platform. Be has licensed OpenGL from SGI, and will be offering it soon to add further 3D functionality.

The last developer release of the BeOS is scheduled for this January, with version 2.0 due four months later.

the goods

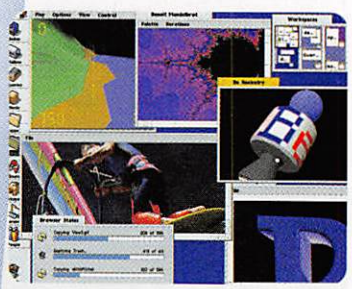
The BeBox is a tinkerer's dream machine, but it's not at all practical.

Sounds Good

The Dual603-133 is designed with advanced audio applications in mind. A 16-bit stereo sound system is provided on the motherboard, with RCA-style line-in, line-out, headphone, and microphone jacks on the back panel. The hardware supports full-duplex operation for simultaneous record and playback. Two sets of independent MIDI in and out ports are provided for networking musical gear together.

Graphics

The BeOS supports a wide range of PCI graphics cards based on S3 and Cirrus Logic chipsets. The Dual603-133 comes with a 64-bit ExpertColor Trio64 card with 2MB of memory. The OS supports resolutions up to 1600x1200, and color depths between 8-bits and 32-bits per pixel. Color depth and resolution can be adjusted on the fly, with no need to reboot or reset applications. You can also configure several different "workspaces," each with its own resolution and color depth.



Drives, Bays, and Slots

There are three full-length 33MHz PCI slots and five full-length ISA slots available. The Dual603-133 comes with a TEAC 6x SCSI CD-ROM drive; a 3.5-inch, 1.44MB floppy drive; and a 2GB Seagate SCSI HD. There is one open internal 3.5-inch drive bay and one open, front-accessible half-height 5.25-inch drive bay.

Light My Fire

Flashing lights are cool, and the Dual603-133 has more of them than anything since the days of the mainframe. In addition to the conventional power and HD-access lights, two columns of 16 LEDs bounce up and down the front of the case. These display the current load on each CPU and tell you at a glance how pegged your machine is.

I/O and the GeekPort

The BeBox has a wealth of I/O ports:

- Four RS-232 serial ports with 16550 UARTs.
- External SCSI II connector.
- PC-style parallel port.
- DIN-style PC keyboard connector and a PS/2-style mouse port.
- Three independent infrared controller ports, each supporting one IR receiver or transducer. (These are not IrDA compliant, but are compatible with A/V remote control applications.)
- Two PC style game ports, each supporting two joysticks via a Y-cable.
- GeekPort—A 37-pin connector that is internally fused and connected to a variety of digital and analog inputs and outputs. The GeekPort is designed to make it easy and safe for tinkers to build their own hardware and interface it to the BeBox.

DOUBLE TAKE

COMPETITION PRODUCES INNOVATION. BUT DEMAND FOR BACKWARD COMPATIBILITY IS A STRONG FORCE—WHICH EXPLAINS WHY NOBODY'S PUSHING BE SOFTWARE. BOTTOM LINE: THE BEBOX IS AN IMPORTANT COMPUTER EVEN IF IT DOESN'T SURVIVE.

—MB

+	−
• 8 72-PIN SIMM SLOTS • RIPE FOR CUSTOMIZING	• CPUS SOLDERED TO THE MOTHERBOARD • IMPRACTICAL

boot verdict

PRICE: $1,995 empty; $2,995 loaded
COMPANY: Be
PHONE: 415.462.4100
URL: www.be.com

S/W

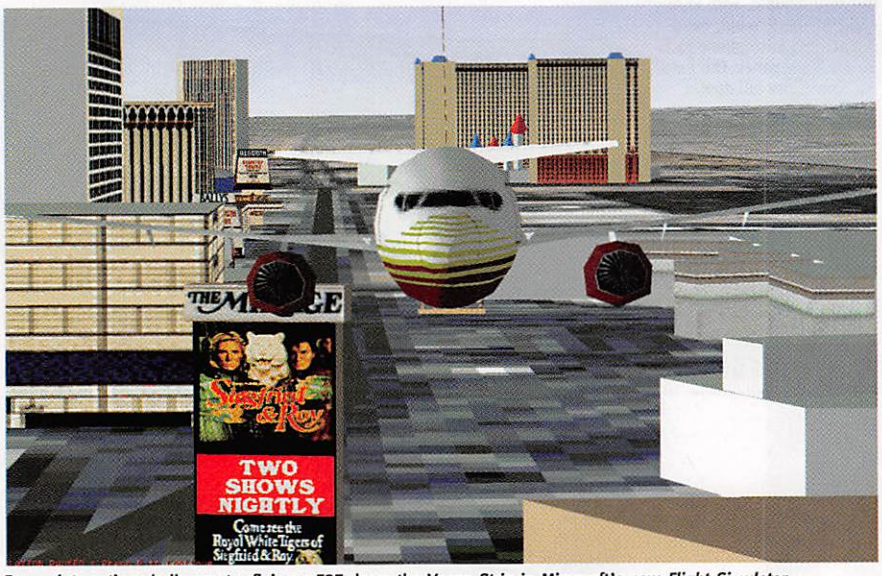
Microsoft Flight Simulator for Windows 95

No guns, but still fun

Flight Simulator has finally made the leap to Windows 95, and Microsoft gave it an overhaul in the process. The grandaddy of flight sims now features an enhanced user interface that makes it easier for beginners and experts alike to configure things and get flying, and there is an online multimedia reference and tutorial that features so much information even real pilots will find it handy.

Flight Simulator gives you the chance to fly a Boeing 737-400, aerobatic Extra 300, Sopwith Camel, Cesna 182RG, Learjet 35A, and the Schweizer 2-32 sailplane. All craft feature exquisite and fully functional digitized cockpits, but only the Cesna features external control surfaces that actually move.

Despite all the improvements, there are a number of areas in which the program is lacking. The sim has no multiplayer support, for example, and there is no advanced air traffic control interaction. Without real flying partners, animated scenery, or any sort of ground-control AI, the world seems static—the occasional local drone traffic notwithstanding.



For an interesting challenge, try flying a 737 down the Vegas Strip in Microsoft's new *Flight Simulator*.

Flying a sailplane over the Golden Gate. Notice how the control panel, display, and map can be resized.

Flight Simulator supports any Windows screen resolution, but only in 256 colors. Even with this limitation, the graphics are superb if you have sufficient horsepower to maintain a high frame rate and scenery density. Zoom low over Buckingham Palace and admire the beefeaters. Fly to Vegas and read the billboard to see who's playing at the Sands.

You can land at 300 airports around the world, and many metro areas feature 3D buildings and landmarks. A few areas are modeled with photorealistic satellite imagery, so the terrain looks real from on high.

The scenery isn't as pretty close up. *Flight Simulator* does a poor job modeling 3D terrain. Most urban areas are just flat (even downtown San Francisco!), and flying through canyons and valleys is visually disappointing because the terrain is too angular and unrealistic.

Cross-country navigation is accurately simulated with VORs and NDBs, though GPS navigation has been ignored. Everything you need to practice precision instrument flight and approaches is accurately provided.

Microsoft Flight Simulator is amazingly comprehensive, and it remains the standard by which all other flight sims will be judged. But the jump from *Flight Simulator 5.1* should have been larger. With serious competition looming in the form of Sierra On-Line's *Professional Pilot* and Looking Glass Technologies' *Flight Unlimited 2*, Microsoft will need to gain some altitude in order to maintain *Flight Simulator*'s leadership role.

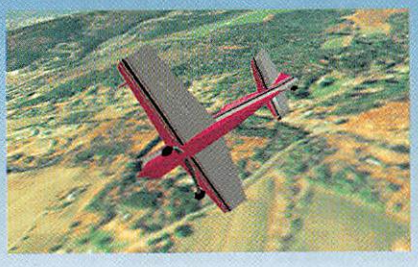
— *Chris Dunphy*

Round the World vs. Round the Block

Which is better, *Flight Simulator* or *Flight Unlimited*? The answer depends on whether you want to experience a simulated airplane, or simulated flight.

Flight Simulator gives you the whole world to play in, and it accurately simulates the navigational and procedural aspects of flying a real plane. To keep things interesting, it also throws in 3D landmarks and scenery around cities. *Flight Unlimited* gives you a much smaller physical space to fly in. It offers beautiful, realistic 3D terrain and an ultrarealistic aerobatic flight model, but there is no navigation, airplane management, or 3D buildings—just pure flying.

The distinction between these two styles of flight sim is beginning to blur. The new version of *Flight Simulator* provides the option of flying an aerobatic plane, and the next version of *Flight Unlimited* will feature multiple airports and thousands of square miles of terrain. And you can get it all for about the price of one hour in a rented plane. — *CD*



boot verdict

PRICE: $59.95
COMPANY: Microsoft
PHONE: 800.426.9400
URL: www.microsoft.com/games

H/W

Gateway Solo 2100

Two steps forward, one step back

Aside from speedier components, the 2100 isn't much different from the Solo 2000 we reviewed in *boot* 01, but several of the touches we admired in the Solo 2000 are now MIA.

But we certainly can't complain about the new, low price.

The 2100 is powered by a 133MHz Pentium, 256K of pipeline burst cache, a 1.35GB hard drive, a 6x modular CD-ROM drive, a 12.1-inch active-matrix display, and a whopping 40MB of EDO DRAM (expandable to 72MB). The Solo 2100 supports two Type II PC cards or one Type III card. Gateway includes a 28.8Kbps modem card that will consume one of these slots. Gateway also added a Zoomed Video port to the bottom PCMCIA slot and the ability to install a second battery in the CD-ROM/floppy-drive bay (although you still have to swap the two drives or use the floppy plugged into the parallel port). The best part is that the Solo 2100 is priced almost $1,500 *less* than the Solo 2000.

The missing Solo 2000 features that we liked include: the analog brightness control on the side of the display; the thumbwheel volume control (both adjustments are now made using the keyboard); the LCD panel that displayed battery status and other information (it's been replaced by a row of idiot lights); and the spring-loaded feet for adjusting the typing angle (you'll have to shove a couple of magazines under it). Sure, these are minor things, but they added value to the package.

The Solo 2100 is a powerful notebook. It delivered excellent benchmark results, especially in terms of its DOS video and disk performance (Windows graphics and CD-ROM performance were less impressive), and Gateway packs it with everything you need.

— *Bryan Del Rizzo*

the goods

The Solo 2100 sports some good features, but having to swap out the floppy for the CD-ROM isn't one of them.

Viewing Habits

The lid housing the 12.1-inch active-matrix display is extremely rigid and exhibited almost no flex. The screen offers excellent off-axis viewing and game performance is great. Video performance under Windows is less exciting, delivering a Graphics WinMark of only 7.69 million pixels per second. The Cirrus Logic CL-7548 graphics processor and 1MB of EDO DRAM produced only 800x600 resolution with 65K colors. We'd like to see 1024x768—especially with an external monitor attached.

Plug It In

Mounted on the back panel you'll find parallel and serial ports, a VGA output, and a docking station connector. Gateway has a hot-dockable port replicator and a mini docking station in the works, but the company hadn't set pricing at press time. The infrared port, line-out, speaker out, and microphone jacks are located on the machine's right side.

Keystone Kapers

The Solo 2100's keyboard has a solid feel (with 2.7mm of travel) and is laid out intelligently, but the cursor-control keys are small enough to be annoying. The Synaptics touchpad is responsive and easy to use. We don't know what possessed Gateway to move the stereo speakers onto the deck below the keyboard—your wrists completely muffle the sound.

under the hood

the brains

CPU	133MHz Intel Pentium
External Cache	Level 2, 256K
RAM	40MB EDO DRAM (72MB max)
Video	Cirrus Logic CL-7548, 1MB EDO DRAM

the brawn

Hard Drive	IBM 1.35GB
CD-ROM	TEAC 46E900 6X
Expansion	2 Type II PC Card or 1 Type III
Lap Weight	6 pounds, 15 ounces
Travel Weight	10 pounds, 14 ounces

the beauty

Display	12.1-inch active matrix
Video	800x600 max res, 65K colors
Sound Card	ESS Technology 1888 FM synth
Speakers	Stereo speakers, headphone jack
Communications	IrDA-compliant infrared port, 28.8Kbps PCMCIA modem

The AC power adapter isn't much bigger than a credit card; so how come Gateway couldn't find a way to integrate it into the case?

+	−
•Excellent DOS video performance •40MB EDO DRAM •Docking station port •Slim design •Zoomed Video port compatible	•CD-ROM and floppy drives share a bay •Volume and brightness controls on keyboard

boot verdict

PRICE: $4,149
COMPANY: Gateway 2000
PHONE: 888.888.0243
URL: www.gw2k.com

A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

Gamepads in the Digital Domain

Take control of your game

To excel at arcade games, such as Virtua Fighter PC, *your controller has to be fast. And if you're going to pull off Wolf's patented Face-Lift kick, it better be smart enough to store the key combos.*

The first generation of PC gamepads sported only four buttons (and just two in two-player mode), and devoured as much as 15 percent of the CPU's clock cycles. No wonder a 12-year-old with a $149 game console could whup your butt in a fight.

That 12-year-old better look out, because a new era of digital controllers is dawning, offering multiplayer support, programmable buttons, and ergonomics for adult hands. These gamepads are faster and more powerful (requiring just one percent of the CPU's time). Make sure the gamepad you buy is compatible with DOS games, such as Crusader: No Regret, *and that it offers precise diagonal direction control without these features.*

Try it out! demo on the bootDisc

Settings

Try out the *Gravis GamePad Pro* and *ThrustMaster Phazer Pad* gamepad settings for *Crusader: No Regret, Manic Karts, Sonic CD, Virtua Fighter,* and *Bug.*

Creative GamePad

The Creative GamePad isn't all that bad, but it isn't all that good, either. It's digital; it's compatible with both DOS games and Win95 games; and you can flip a switch and turn it into an analog controller. So far, so good. But Creative failed to make the pad programmable. Bad move.

Programming Interface 0
Functionality 5
Ergonomics 6
Performance 5
Game Compatibility 6

In terms of design, the pad resembles a garishly painted Sega Saturn controller. And without subjecting the device to chemical analysis, the plastic shell and buttons feel far less substantial than the components in the other controllers. The buttons exhibit much more sideways travel, for example, and the directional pad feels loose, resulting in imprecise diagonal movement.

The buttons are well laid out, except that button C is a little awkward to reach (you have to arch your thumb to reach the button comfortably). Although the problem with most gamepads is that they're too small, this one actually feels too big: The distance between the left and right hand is double that of the Microsoft SideWinder and Gravis GamePad Pro.

Creative Labs promises the pad will ship with a collection of game-control settings, but none of these were available for this review. Compared to the Gravis GamePad Pro, the no-frills Creative GamePad is strictly for amateurs. Compared to Microsoft's offering, the pad comes up way short due to its lack of programmability, but at least you can use it with DOS games.

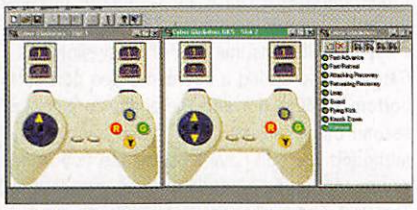
boot verdict

PRICE: $29.95
COMPANY: Creative Labs
PHONE: 800.998.1000
URL: www.creativelabs.com

Gravis GamePad Pro

Gravis' digital GrIP hardware allows you to connect an unlimited number of controllers with an unlimited number of buttons to your PC.

Fully digital and programmable, the GamePad Pro will be familiar to anyone who owns a Sony PlayStation. Eight buttons are grouped in fours—four on the top, plus four triggers in back. The buttons are appropriately spaced, but because the pad is so small—it needs longer pontoons—it can be difficult to hit only one button at a time. The directional pad is great—diagonal movements are dead on, and you can even screw a mini joystick handle into it. Flip a switch, and the GamePad Pro turns into a conventional analog controller.



Gravis' *GrIPKey* programming interface is great.

Hook up two controllers using the Y-cable adapter that's molded into the end of the cable; but if you want to use more than two controllers at a time, you'll need to purchase additional GrIP hubs (each of these will support up to four pads).

The GamePad Pro ships with more than 55 preconfigured GrIP settings, but what makes this gamepad stand out is its depth of programmability and functionality. The *GrIPKey* programming interface is top notch. Create a function list of game commands and simply drag them to any of the screen representations of the pad's 10 buttons or direction pad. Assign up to 255 keystrokes to each button (that's one long cheat code!), and the button action can store a different keystroke for the button press *and* button release. You can also decide how the buttons will work: Step mode lets you step through a string of characters one by one, which is perfect for weapons selections; Loop mode will cycle through a string all at once; and Auto-Repeat mode works like a traditional turbo fire.

Configurations are saved to disk and can be printed for visual reference. The configurations can also be loaded from a DOS command line, which is useful if you're not running Win95. And since the GamePad Pro sports an EPROM, there's no need to reload the settings until you play a different game.

Plenty of games (including all of the EA Sports titles) already support GrIP technology. But when you factor in the ease of programming and the pad's virtuosity, the GamePad Pro is hard to beat.

Programming Interface . **10**
Functionality **9**
Ergonomics **6**
Performance **9**
Game Compatibility **8**

boot verdict

PRICE: $29.95
COMPANY: Advanced Gravis
PHONE: 800.663.8558
URL: www.gravis.com

Holy Gamepads Batman!

Alps Interactive will introduce its first gaming peripheral early next year. The company's radical 14-button Alps Interactive GamePad looks like an accessory from the Bat Cave. We put our hands around the rubber grip of a non-working prototype and were impressed with the feel, but we'll reserve judgment until we've endured a few hours of hard play.

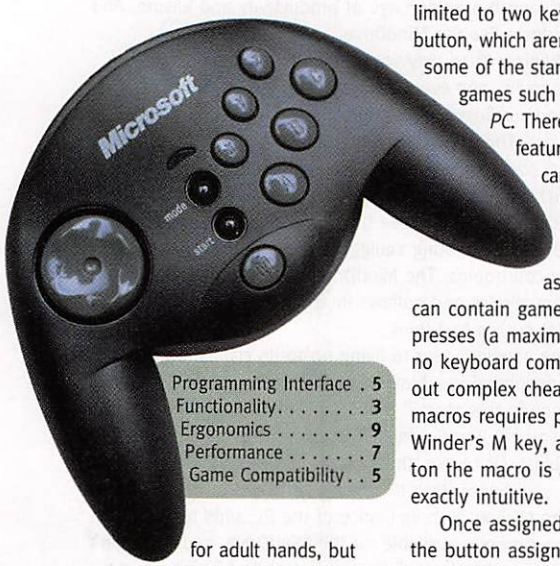
Alps claims theirs will be the first USB-compatible programmable gamepad. Although several computer manufacturers, including Compaq, AST, and IBM are shipping desktop computers with USB ports, compatibility problems with the current Win95 build render these ports useless—at least for now. Alps, however, promises that their pad will support all versions of Win95. — *BDR*

Microsoft SideWinder GamePad

Microsoft surprised a skeptical gaming world last year with their excellent SideWinder Pro joystick, and we expected the SideWinder GamePad to be equally impressive. At first glance, the SideWinder GamePad looks like a winner (although some think it looks like a cow's udder), but beyond the stunning aesthetics, the pad fails to deliver.

The SideWinder GamePad's anemic programming utility is a big letdown.

The SideWinder, a cross between the Sega Saturn and the Nintendo 64 pads, is very comfortable to use. The buttons are well placed (especially the triggers), and they feel solid and sound remarkably quiet. The pad is well proportioned



Programming Interface . 5
Functionality. 3
Ergonomics 9
Performance 7
Game Compatibility . . 5

for adult hands, but may be a tad big for kids. The directional pad is accurate and effective, offering precise diagonal moves.

Up to four SideWinders (or other joysticks) can be daisy chained, thanks to an integrated game port connection on the back of each pad. But connecting directly to the pad can be cumbersome—especially if the person attached to the other end of your leash yanks the cable just as you're about to perform a complicated move. Plus, the additional plug adds just enough weight to slightly throw off its balance.

The SideWinder's biggest problem is its level of programmability. The *Game Device Profiler* allows you to create macros and map keyboard strokes to any button, but you can't assign keyboard commands to the directional pad. Worst of all, you're limited to two keystrokes for each button, which aren't enough for some of the standard moves in games such as *Virtua Fighter PC*. There's no turbo-mode feature either, and you can't assign the same keystroke twice.

Equally disappointing is Macro assignment, which can contain gamepad button presses (a maximum of 10), but no keyboard commands—ruling out complex cheat codes. Activating macros requires pressing the SideWinder's M key, and then the button the macro is assigned to—not exactly intuitive.

Once assigned, it's nice to print the button assignments, but there's no printing option. And even when you view the button assignments on screen, you can look at either the keystrokes or the macros, but not both at the same time.

The SideWinder GamePad is designed to work with native Win95 games, (or games running in a DOS shell), but no preset game configurations are included. DOS support isn't included, either; so unless you're running Win95, the SideWinder GamePad is useless.

Ergonomics notwithstanding, the SideWinder's programmability is a major disappointment.

boot verdict

PRICE: $44.95
COMPANY: Microsoft
PHONE: 800.426.9400
URL: www.microsoft.com

ThrustMaster Phazer Pad

ThrustMaster is known for its high-end, realistic flight joysticks. The Phazer Pad is their first stab at a gamepad, and it ain't bad.

A combo digital/analog controller with eight buttons, the Phazer Pad can be used in DOS and Win95. Unfortunately, it must be plugged into your game port and your keyboard port to be programmed. You'll need to plug your keyboard into a PS/2-style pass-through port at the end of the pad's cable, which means if your keyboard uses a DIN-style connector, you'll have to attach an adapter. A kludgey solution at best, and it gets worse when you're using two Phazer pads on the same system. A bigger problem is that the pad will send keystrokes to whatever application is active.

The Phazer Pad is comfortable to hold: the pontoons extend into the palms of your hands, delivering good support. Most of the buttons are well positioned (except the two fire buttons on the back), but they feel too rubbery. The two triggers on the back are spring loaded and bounce back firmly. The unique thumbwheel throttle on the front is perfect for playing games such as *MechWarrior 2*.

ThrustMaster's Phazer Mapper programming interface is easy to use.

The *Phazer Mapper* programming interface is easy to use. Click a button, then use the virtual keyboard to assign keystrokes. You're limited to 255 keystrokes per button, but each keystroke must be followed by a space, reducing the number of keystrokes per button to just over 100. The pad supports different keystrokes for button press and button release, but you must type a special command to accomplish this.

You need to flip a switch to put the pad into a mode to download the

Programming Interface . 5
Functionality. 8
Ergonomics 6
Performance. 7
Game Compatibility . . . 7

control settings from the programming utility. You can also program the Phazer Pad in DOS, although the interface is a little cumbersome. You can print the control settings, but they're not very useful because they contain only text information and keyboard commands.

The Phazer Pad is a good product, but the keyboard interface makes connections more complicated than necessary—and this pad is priced significantly higher than the rest of the field.

— *Bryan Del Rizzo*

boot verdict

PRICE: $59.95
COMPANY: Thrustmaster
PHONE: 503.615.3200
URL: www.thrustmaster.com

S/W

boot KICK ASS! PRODUCT

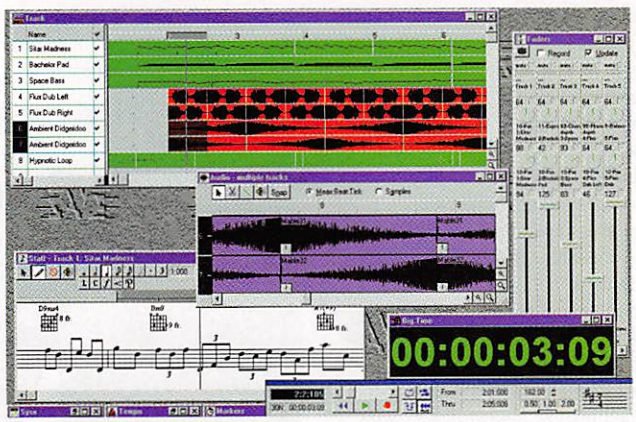
Cakewalk Pro Audio 5 Deluxe

The icing's sweet

Cakewalk Music Software has taken their jammin' MIDI sequencer/digital-audio recorder, *Cakewalk Pro Audio 5*, and made a number of improvements. This latest incarnation offers all the Win95 goodies: 32-bit code, drag-and-drop editing, the ability to run multiple iterations, dedicated multithreading, and disk-cache bypass for stable playback. And Cakewalk has brought back CAL, the scripting tool that was missing from version 4.0.

The Deluxe version also includes a bonus CD containing *Virtual Jukebox*, *Cakewalk TECHniques*, *Jammer Hit Session*, *Hy-ph-en-a-tor*, some extra groove templates, *CanvasMan GS Patch Editor/Librarian*, and a pant load of MIDI/audio files.

Cakewalk offers tools for processing recorded audio, including graphic and parametric EQs, custom cross-fades, normalizing, extract audio timing, and—handiest of all—remove silence, which not only cleans up mixes, but also conserves precious disk space. If that isn't enough digital-audio editing power for you, *Cakewalk* provides a pipeline that squirts the clip over to a stand-alone waveform editor.



You'll want a high res display to fit all these windows comfortably on screen.

No software is perfect, however, and *Cakewalk* has its share of anomalies. When the Loop tool selects a range of MIDI or digital-audio clips there's an annoying pause before looping back around.

Also, *Cakewalk* is limited to 256 MIDI channels and 256 tracks per song (Opcode's *Vision for Windows* supports an unlimited number of tracks, but it doesn't support digital audio).

Try it out! demo on the bootDisc

Cakewalk is a professional tool suitable for the most demanding applications, yet designed such that anyone can access its power. And if you want digital-audio with your MIDI tracks, it's the sweetest recipe in town.

— Daevid Vincent

boot verdict

PRICE: $479
COMPANY: Cakewalk Music Software
PHONE: 888.225.9255
URL: www.cakewalk.com

H/W

The MindDrive secures snugly to a digit via the application of Velcro technology.

MindDrive

Quick! Pull my finger!

Every so often a technology emerges that promises to shatter the existing paradigm and launch a golden age of productivity and leisure. And then there are gadgets like the MindDrive.

From the packaging: "Use only your thoughts—to move images, run computer programs, and even play games." How it works: Strap a plastic splint onto your finger, plug it into the wall and into your PC, sit back, and think hard. The device reads the bioelectric patterns generated by your emotional state. These subtle galvanic responses are the basis for polygraph machines (commonly known as "Lie Detectors"). In the hands of a skilled professional, these big, expensive devices—complete with twitching needles generating squiggly lines—are admissible as evidence in many courtrooms. The MindDrive, on the other hand, is likely to administer giggles and guffaws in any room where it's being used. Which is not such a bad thing.

Despite coming nowhere near to living up to its claims, the notion of a lie-detector peripheral is a blast at parties or in groups. "Are you in love with anyone in this room?" Bip. "Have you ever shaved your butt?" Bip. "Did you kill Ron Goldman?" Buzzzzzz! It's digital Truth Or Dare, and it's a blast. Of course, the game would probably be just as entertaining with your finger stuck in a hair roller wired to the microwave oven, but still, the shallow tech ambiance of the PC adds to the fun.

Ten games are currently available for the MindDrive, and I wouldn't anticipate more unless there's a wild surge in installed base. *Fib* is a lie-detector game. Ignore the silly fill-in-the-blank questions and just use the true/false interface for your own freestyle interrogations. *MindBowling* is actually a pretty good bowling sim. You wait for the aiming device scrolling back and forth across the bottom of the screen to line up your shot—controlling it with your mind, of course—and press the space bar (with a finger from your free hand) to let loose your tenpin fury. The game's 3D graphics follow the ball up the lane, swerving and veering from the force of your thoughts, until impact. Also available is *MindSkier*, another decent-looking game, where you navigate down slalom and downhill 3D slopes dodging obstacles—controlled only by your mental prowess. Practice and try the ski-jump event. Definitely not for the timid.

Is the MindDrive a gimmick? Yes. Is it fun? Sure.

— Brad Dosland

boot verdict

PRICE: $139.95; games range from $24.95 to $39.95
COMPANY: The Other 90% Tech.
PHONE: 800.223.2363
URL: www.other90.com

Force FX

The new force feedback joystick from CH Products.

You've never felt anything like it. The new Force FX Joystick jolts gameplay into the thrill zone. Feel the true-to-life vibration of revving engines and rough roads. Brace yourself for air turbulence or engine stall buffeting, and hang tough against the vector force in a tight turn. Now, fire off a round and feel it kick back. The Force FX puts the yeehaaahh into flight simulations, driving, space combat and just about any other game. Your palms will sweat. Your knuckles will turn white. You'll swear it's alive.

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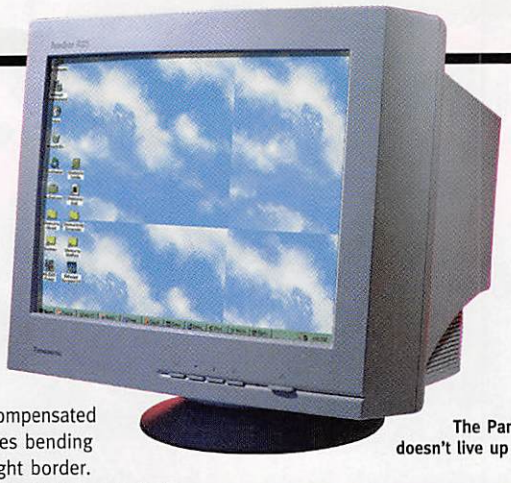
Product Information Number 110

H/W

Panasonic PanaSync S21

Deck the halls with gobs of pixels



The PanaSync S21 doesn't live up to its size.

At first glance, Panasonic's PanaSync S21 is a near twin to the highly-rated ViewSonic P810 reviewed in *boot* 02. Both monitors sport 21-inch high-contrast/low-glare shadow-mask tubes; they both support resolutions up to 1600x1200 with 75Hz refresh rates; and they both boast an ultrafine dot pitch of 0.25mm. But don't let glances deceive you. Where the ViewSonic surprised us with its near-flawless picture, the PanaSync S21 surprised us with its many flaws.

The *DisplayMate* Video Obstacle Course (see sidebar) revealed serious horizontal convergence problems that could not be adjusted away. This was particularly evident in the lower left of the screen. Other problems included moire patterns that could be removed only with manual adjustment of the built-in moire filters, and a slight asymmetry with the pin cushion that could not be compensated for—resulting in straight lines bending along the screen's left or right border.

The S21 features on-screen digital controls for brightness, contrast, position, size, pincushion, trapezoid, parallelogram, moire reduction, degaussing, and color level; and the 13 most recent settings are retained in memory. The S21 is Energy Star compliant, and it speaks VESA DDC for Plug-and-Play configuration. It also adheres to the TCO '92 standard for electromagnetic emissions.

None of the S21's flaws would be severe in a smaller monitor costing a thousand bucks less, but a high-end monitor should deliver much more. If you're making the leap to the glorious world of 21-inch displays, don't compromise your eyes for your wallet.

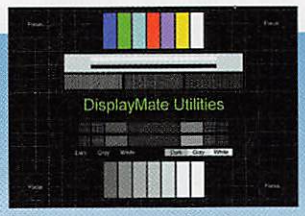
— Chris Dunphy

The S21's Optimal Resolutions with Maximum Refresh Rates

640x480	@	160Hz
800x600	@	147Hz
1024x768	@	116Hz
1280x1024	@	89Hz
1600x1200	@	76Hz

boot verdict

PRICE: $1,699
COMPANY: Panasonic Communications & Systems
PHONE: 800.742.8086
URL: www.panasonic.com



DisplayMate for Windows

Give your monitor a tuneup

If you're thinking of spending a wad to upgrade to a nifty new monitor—wait! Are you sure you're getting all you can out of your old one?

DisplayMate acts as an expert guide to fine-tuning your monitor. It walks you through a series of test patterns (more than 110 in all) designed to show the flaws and faults in any monitor. Each test tells you how to adjust your monitor and graphics card settings to achieve the best possible picture. Once tweaked to perfection, a periodic tune-up with *DisplayMate* keeps them looking that way.

boot verdict

PRICE: $79
COMPANY: Sonera Technologies
PHONE: 800.932.6323
URL: www.displaymate.com

Try it out! demo on the bootDisc

Short of esoteric lab equipment, *DisplayMate* is also the best tool available for comparing monitors. You can take *DisplayMate* shopping with you on a single floppy and put any potential purchases through the software's Video Obstacle Course. *DisplayMate* is so unique and useful it has become an essential part of the bootLab's benchmarking toolkit. *— CD*

Tektronix Phaser 350

See the world through rose (or teal, or mauve, or...) glasses

Is there anybody out there still buying monochrome monitors? No. Then why are people still buying black-and-white laser printers? Hmmm. Well, in the past, transferring your on-screen world of colors to paper meant some serious compromises. Inkjet, thermal transfer, dye sub... all entailed sacrifices in quality. Tektronix's Phaser 350 may not be the first color laser-caliber printer, but it is the first that's remotely attainable for many people who crave escape from their monochrome blues.

In all fairness, Tektronix pimps this printer as a business machine, and it excels as one. We ran ours via direct connection and as a network printer. The included *PhaserLink* software allows you to assign your printer a URL so you can check the status of the printer down to the paper stock loaded, access online documentation, and troubleshoot problems via a Web page. The 8MB of onboard RAM handle the print queue gracefully, only occasionally backing up when bombarded with mixed jobs from PCs and Macs.

The solid ink images clock in at 300dpi. Color is provided by easy-to-replace ColorStix (think "crayons") and, in order to keep print costs down, Tektronix is giving away free black ink with every purchase of a three-stick box of cyan, yellow, or magenta ink. Additional black ink is available for free on request. The goal of all this is to keep the

S/W

Try it out! demo on the bootDisc

Star Control 3

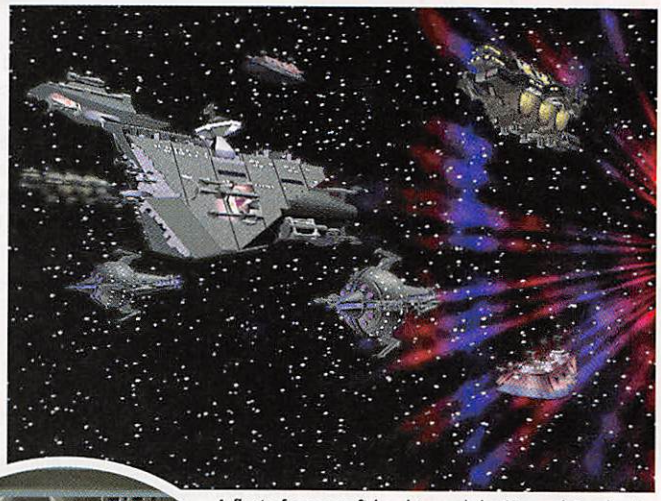
Worth the wait

Star Control 3 proves that good things *do* come to those who wait.

The game gets under way with the universe on the brink of yet another disaster. While exploring and colonizing the Kessarri Quadrant, your primary mission is to find out why the fabric of the universe is crumbling. If any members of the League of Sentient Races are captured or interrogated by a hostile race, all hell breaks loose and only Hyper Melee combat decides who rules and who dies.

Accolade went all out and designed movie sets and 24 different animatronic aliens for the game, and these aren't used for simple cut scenes. You interact and negotiate with these creatures through on-screen dialog boxes. *Star Control 3* isn't exactly a game about ethics, so don't be surprised if your so-called allies betray you in the middle of the game.

Colonization is key to winning. Execute a sensor scan on every moon and planet you discover. Look for planets rich in natural resources, so you can mine, develop, and research new technologies. As each colony grows, you'll gradually develop fuel refineries, mines, factories, star bases, and landing pods.



A fleet of spacecraft head toward the Kessarri Quadrant.

The game's strategy phases occur in this grid view.

Accolade spared no expense, designing animatronic aliens and Hollywood-style movie sets for *Star Control 3*.

It's important to spread your colonies out to the far reaches of the galaxy. You'll need places to restock your supplies and fuel strategically placed throughout the sectors. Pile them all into one sector and you'll find yourself in deep space without a fuel depot.

Star Control 3 is a complex game that requires a significant time investment to master, but it won't disappoint *Star Control* fans.

— *Bryan Del Rizzo*

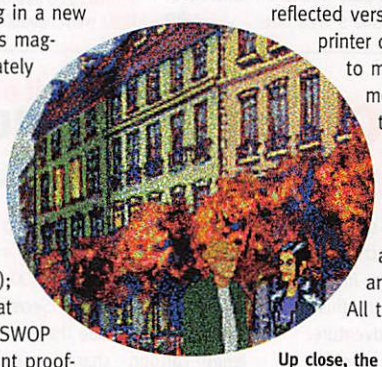
boot verdict

PRICE: $59.95
COMPANY: Accolade
PHONE: 800.245.7744
URL: www.accolade.com

8

cost per color print down around five cents per page. Very reasonable. Its rated 6ppm should be taken in the same light as mpg in a new car. A typical print, such as this magazine page, requires approximately one minute. Attaching a SCSI drive full of fonts to the Phaser's SCSI 2 port speeds matters up considerably.

In general, color is good. Built-in TekColor provides color correction for Vivid Color (bright colors for presentations); Simulate Display (to match what appears on screen); and three SWOP press specs (for commercial print proofing). The printer defaults to Vivid mode, which generates very bold colors; printing continuous tone images here can be a scary proposition.



Up close, the output from the Phaser 350 looks like it's from an impressionist painter, not from a laser printer.

The Simulate Display mode is really a lost cause given the vast differences in the very nature of reflected versus projected light. No printer can expand its color gamut to match the huge range of a monitor and, to make matters worse, the correction software doesn't accommodate hardware calibration, so the broad variations between make and age of individual monitors are not compensated for. All this said, the display mode is vastly better than no correction (which is offered by other, more expensive, color printers) and spares the patient desktop printer the dreaded "color-shift surprise" of seeing your carefully tuned image spewed out in nightmarish hues. SWOP specs are not Matchprint quality, but serve as a rough guide to press repro.

An LCD panel up front tells you what your Phaser is feeling and allows you to set options and provide the needed therapy with relative ease.

Color is good and the Phaser 350 is a reasonable route for businesses or ambitious types that seek goodness.

— *Brad Dosland*

boot verdict

PRICE: $3,495
COMPANY: Tektronix
PHONE: 800.835.6100
URL: www.tek.com/color_Printers/

8

S/W

NetObjects Fusion

World-wide cookie cutter

Try it out! demo on the bootDisc

As the name implies, *NetObjects Fusion* treats all items as objects that can be dragged, resized, and otherwise manipulated, similar to a traditional page layout program.

Pressed for time? *NetObjects* includes enough templates (About, Contact Info, Catalog, and so on) that you can get a basic page up in no time. Once you have a basic design, change its look and feel almost instantly by applying a style to banners, buttons, and other objects. Whenever you change an object, every object with that style also changes, making for fast facelifts.

You'll find all the usual Web tools (tables and forms tools, graphics previews, and support for Java, ActiveX, and ShockWave), but no audio preview. And, oddly, no tools for editing HTML. It's critical to see the page in its native format.

If *NetObjects* could import existing sites, it would be all that and a bag of chips; as it stands, it's just all that. — *DV*

boot verdict

PRICE: $495
COMPANY: NetObjects
PHONE: 888.449.6400
URL: www.netobjects.com

8

Rand McNally TripMaker 1997

The journey is its own reward

boot KICK ASS! PRODUCT

Much more than a simple guide from point A to point B, *TripMaker* gives you the lowdown on everything from restaurants to hotels to roadside attractions throughout North America. Plug in your origin and destination points, click Scenic, Shortest, or Quickest, and the program calculates your route. When it's finished, you have the option of jumping onto Rand McNally's Web site, where you'll find a personalized Web page generated specifically for your trip, with road-construction info for every major road and highway along your route. The Web page also contains information about your origin and destination points, plus points of interest along the way. If you decide to visit Pebble Beach, for example, your page will include a link to The Lodge at Pebble Beach Web site. Each time you add a side trip or stopover, *TripMaker* recalculates your trip and refreshes your custom Web page with new links.

One gripe: *TripMaker* doesn't logically add side trips from the middle of your journey, insisting you backtrack from your last stopover prior to your destination.

Still, *TripMaker* makes travel fun again. — *MB*

boot verdict

PRICE: $39
COMPANY: Rand McNally New Media
PHONE: 800.671.5006 x601
URL: www.randmcnally.com

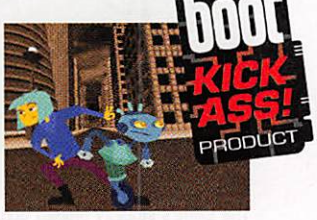
9

Escape From Dimension Q

Elroy *to the nth degree*

Escape from Dimension Q, the latest offering from Headbone Interactive, combines the same funny, funky art direction that distinguished the *Elroy* series but with a much better set of puzzles. To break the limitations of linear storytelling, all of your decisions directly impact the game's critical path. Obstacles can be skipped and returned to later, so you can still complete the mission, but your odds definitely go down. And the puzzles contain random elements that change from game to game, increasing replay value. This is one smart game.

The story revolves around a musically inclined girl named Iz and her robot sidekick Auggie. The pair are hurled headlong through the goo portal to a mysterious dimension. Their mission? Rescue lost agents of the Decentralized Intelligence Agency and get home. Before returning, they must face the ultimate in evil: a record producer!



Dimension Q is just the first in this new series, but if after this disc, you're hungry for more Iz and Aug, the disc comes bundled with AT&T WorldNet access and *Navigator* to play online *Dimension Q* games at Headbone's Web site. — *BD*

boot verdict

PRICE: $29.95
COMPANY: Headbone Interactive
PHONE: 206.323.0073
URL: www.headbone.com

9

Circle of Blood

A story and animation with depth

Try it out! demo on the bootDisc

Despite its ominous title, *Circle of Blood* is not a shoot-'em-up. Featuring beautiful animation; a well-written script; a rich orchestral score; and a deep plot involving murder, intrigue, and a manuscript by the medieval Knights Templars, this game is an engrossing graphic adventure.

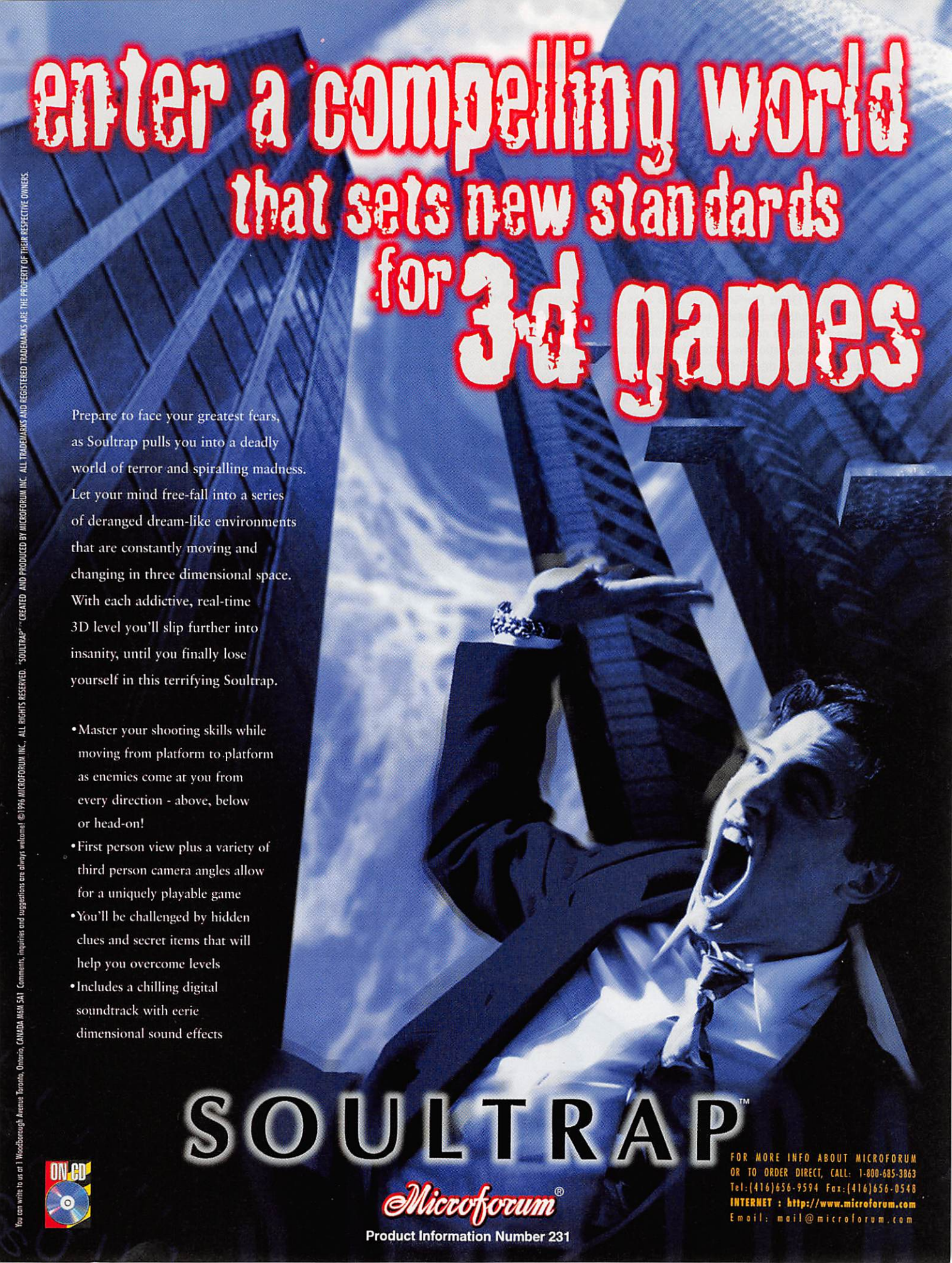
Unlike others in this genre, *Circle*'s clever inventory-based puzzles are integral to the plot. And gameplay involves more than screen-trolling for hot spots: You must interact with dozens of characters to unravel the mystery. But look elsewhere if you're after jam-packed action. In developing its deep plot, *Circle* occasionally goes over the edge and becomes a mini-movie.

The hand-drawn 640x400 animation is by alumni of Don Bluth Studios (*The Secret of Nimh*, *Dragon's Lair*). Ten parallel layers imbue the game with the look of a feature-length cartoon—characters grow larger as they approach, and smaller as they move deeper into the scene. Fortunately, this technical tour de force isn't accomplished at the expense of gameplay. — *MB*

boot verdict

PRICE: $54.95
COMPANY: Virgin Interactive Entertainment
PHONE: 800.874.4607
URL: www.vie.com

8


enter a compelling world
that sets new standards
for 3d games
Prepare to face your greatest fears, as Soultrap pulls you into a deadly world of terror and spiralling madness. Let your mind free-fall into a series of deranged dream-like environments that are constantly moving and changing in three dimensional space. With each addictive, real-time 3D level you'll slip further into insanity, until you finally lose yourself in this terrifying Soultrap.
•Master your shooting skills while moving from platform to platform as enemies come at you from every direction - above, below or head-on!
•First person view plus a variety of third person camera angles allow for a uniquely playable game
•You'll be challenged by hidden clues and secret items that will help you overcome levels
•Includes a chilling digital soundtrack with eerie dimensional sound effects
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ON CD
You can write to us at 1 Woodbourough Avenue Toronto, Ontario, CANADA M6M 5A1 Comments, inquiries and suggestions are always welcome!
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H/W

TravelMate 6030

A worthy travel companion

There's a thin line between power and portability. Texas Instruments manages to pack some serious technology into their top-of-the-line TravelMate 6030, making only a few compromises in the name of weight reduction.

The 6030's 133MHz Pentium is fed by a 256K pipeline burst cache and 16MB of EDO DRAM (expandable to 72MB). Despite having all the components of a multimedia notebook, TI treats the CD-ROM drive as a $299 option. (The configuration we tested *did* include a 6x IDE-ATAPI drive.)

With the CD-ROM drive installed, the box tilts the scales at a healthy 6 pounds, 9 ounces. Not including the more than 1 pound powerbrick. Fortunately, that bulk delivers all the components you'd expect in a high-end laptop, including a removable 1.35GB EIDE hard-disk drive, 12.1-inch active-matrix display, and a docking station port. The modular drive bay accommodates a second battery, a second hard drive, a high-capacity floppy drive, or the CD-ROM drive.

TI crams plenty of other great features into this box. The Cirrus Logic CL-7548 graphics controller, supplemented by 2MB of EDO DRAM, produces video resolution up to 800x600 with 16-bit color depth. And the Zoomed Video Port delivers exceptional motion video performance.

The 6030's video performance was exceptional both in DOS and Windows. Hard drive and CD-ROM performance was also above average for a laptop.

Of course, not everything is sweetness and light. Just look at the screen: It's bright and crisp dead on, but move off axis by 20 degrees and the image practically disappears. And TI takes the phrase "industrial design" a little too seriously. With its flat brown exterior and its severe edges and corners, the TravelMate 6030 is a dead ringer for a UPS driver's electronic clipboard. This one's definitely not a looker.

Gaze beyond the TravelMate 6030's utilitarian appearance—and its few flaws—and you'll see a notebook that offers raw power and tasty refinements to please the palette of the most discriminating mobile user.

— Bryan Del Rizzo

Double Take

Ultimately, a computer should be judged solely by its abilities, and the 6030's a very capable notebook. Still, there's no getting past the fact that it's a tad on the homely side and the pointing device will have your fingertips bleeding.

-BD

under the hood

the brains

CPU	133MHz Intel Pentium
External Cache	256K pipeline burst
RAM	16MB EDO DRAM (72MB max)
Video	Cirrus Logic CL-7548, 2MB EDO DRAM

the brawn

Hard Drive	IBM EIDE 1.35GB
CD-ROM	KME, 6x IDE-ATAPI
Expansion Bus	2 Type II PC Card or 1 Type III
Lap Weight	6 pounds, 9.2 ounces
Travel Weight	7 pounds, 11.2 ounces notebook and adapter

the beauty

Display	12.1-inch active matrix
Video	800x600 max res, 65,000 colors
Sound	ESS Technology 1888 FM synth
Speakers	Stereo speakers; headphone jack
Communications	IrDA infrared port; speakerphone

Zoom!

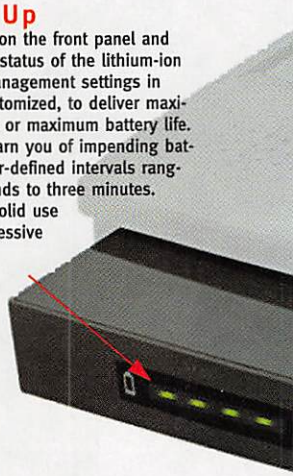
The 6030 supports two Type II PC Card devices or one Type III device. Placeholder cards eliminate the need for a fragile plastic door. The machine also supports Zoomed Video Port technology. The Zoomed Video Port bypasses the system bus and CPU to directly feed video data from a PC card to a video controller. This results in faster, smoother video than conventional solutions. According to the Zoomed Video Port spec, it's possible to pump video through the system with 640x480 resolution at a full 30fps. The hitch? No manufacturer, including TI, offers Zoomed Video Port peripherals yet.

Go the Extra Mile

The AC power adapter is small enough and light enough that it should have been integrated into the case.

Light Me Up

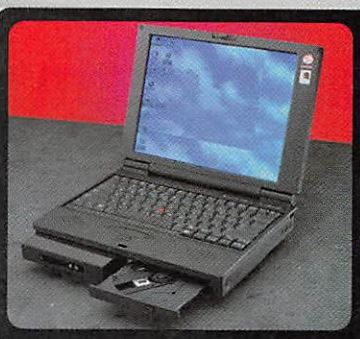
Press this button on the front panel and LEDs indicate the status of the lithium-ion battery. Power management settings in Win95 can be customized, to deliver maximum performance or maximum battery life. Audible alarms warn you of impending battery failure at user-defined intervals ranging from 30 seconds to three minutes. Battery life with solid use averaged an impressive three hours.



A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

Complete with Mags

Unlike most Pentium-powered laptops, the 6030 doesn't require a cooling fan. That's because the machine's rear panel does double duty: It's both a magnesium heat sink and the mounting location for the serial, parallel, and VGA monitor ports. There's also a docking station connector here (TI's docking-station options range from $260 to $521). A PS/2-style keyboard/mouse port, IrDA port, stereo line-in and line-out connectors, and a microphone jack are located on the sides.



the goods

TI's TravelMate 6030 is a solid notebook computer value, but it would be even better if you could use the floppy and CD-ROM simultaneously.

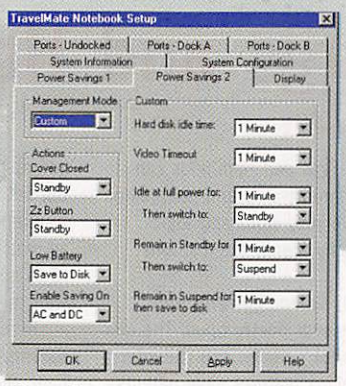
Need a Manicure?

The 6030's pointing device (TI calls it "The Stick") feels like an emery board. You could give yourself a manicure playing *Z*, but the coarseness might bug sensitive finger tips. The keyboard sports solid tactile feedback, and its 86 keys are big and well placed. Oddly, there is no Ctrl key on the right side, an oversight that will drive touch typists bonkers.

With its built-in 28.8Kbps fax/modem and microphone (hidden behind the right speaker) the 6030 functions as a speakerphone. Click on the desktop icon labeled "Talk with TI Support," and you'll immediately be connected to TI's tech support department (a toll-free call no less). Nice touch.

Disappearing Act

The TravelMate 6030's 12.1-inch active matrix display folds flat for use with a CRT monitor. The lid is rigid and exhibits minimal flex, but has poor off-axis visibility. Brightness is adjusted using keyboard commands; analog controls are much easier to use. The Cirrus Logic 7548 graphics controller, augmented by 2MB of EDO DRAM, delivers 800x600 resolution and 16-bit color depth. The chip also handles YUV-to-RGB color space conversion to deliver vibrant, crystal-clear video even when expanded to full screen.



TI's excellent power management utility enables you to fine-tune the 6030's power consumption and battery-life alarms.

+	−
• 133MHz Pentium • Excellent power-management utility • Docking station port • Zoomed video port • RAM expandable to 72MB • Speakerphone	• CD-ROM drive is optional • Poor display when viewed off axis • Severe industrial design • On the heavy side

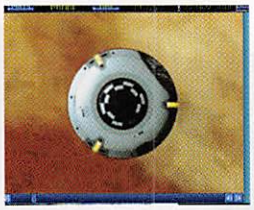
boot verdict

PRICE: $4,999 ($5,298 as tested)
COMPANY: Texas Instruments
PHONE: 800.848.3927
URL: www.ti.com

S/W

Solar System Explorer

Fly me to the moon



Set in the year 2019, *Solar System Explorer* combines fantasy with hard science to deliver a realistic and highly accurate space-flight sim.

Pilot the spacecraft Explorer to any planet or moon in the solar system, enter an orbit, and study the body's magnetic field, weather, seismology, and atmospherics; drop probes onto its surface; and examine detailed maps of its geography. Scientific accuracy is emphasized at every step: You won't encounter alien beings and you don't pack weapons, but the sim is packed with relief maps, 3D animation sequences, diagrams and drawings, and is augmented by an online link to Maris' Web site.

Given *Explorer*'s emphasis on realism, the over-the-top depiction of the spacecraft's interior, with black marble walls and Corinthian columns, is disappointing. But the fantastic animated depictions of volcanic eruptions, magnetic fields, and other phenomena make up for it. — *MB*

boot verdict

PRICE: $49.95
COMPANY: Maris Multimedia
PHONE: 800.526.2947
URL: www.maris.com

Building My **World**

Nurturing the next Frank Lloyd Wright

Building My World combines origami and CAD concepts to teach kids six and up 3D geometry and spatial reasoning.

The program's interface is simple and intuitive, although some tools require basic reading skills. Using basic objects —a rhombus, a cube, a sphere, and so on—kids can build anything they can imagine, from a helicopter to the Golden Gate Bridge.

Building My World is innovative, but it could be better. Building blocks can be stretched or squashed before being placed, but they can't be manipulated (other than moved or erased) afterward. And kids would learn more if the objects were identified by name.

3D design is inherently fun, but what really moves a child's concept of geometry from the realm of the abstract into the concrete is the ability to print the models they have created: Kids simply fold along the dotted lines and build real models of their on-screen creations.

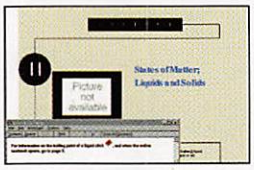
Building My World needs some polish, but it's sufficiently unique to be worthy of consideration. — *MB*

boot verdict

PRICE: $24.95
COMPANY: 3DP Object Technology
PHONE: 714.854.8680
URL: www.3dptech.com

ChemLab

Flame on



ChemLab does such a bad job of teaching chemistry that it could drive a chemist to wear natural fibers.

Choose from one of four theme labs: Contemporary, Dungeon, Futuristic, or Tropical. It doesn't really matter which one, because the only thing that changes is the style of elevator music playing in the background. Each is equipped with the gear you'll need to perform one of the eight experiments, (count 'em, *eight* whole experiments). The most complex involves elevating the boiling point of water by adding a solvent. Be careful. Drop that bottle of Thymol and it *will* break, forcing you to start from scratch.

The program's help system is a chemistry textbook. The material is excellent, but poorly formatted: Pages don't fit the screen, and navigation consists of dumping you into the proper chapter and telling you "when the online textbook opens, turn to page..."

I could go on, but what's the point? *ChemLab* is without a doubt one of the worst education titles I have ever seen. — *MB*

boot verdict

PRICE: $79
COMPANY: Corel
PHONE: 800.772.6735
URL: www.corel.com

Green Eggs **and Ham**

Try it and you may, I say

In this digital version of *Green Eggs and Ham*, kids can either read along with the animated words and pictures on screen, or stop along the way to play word and logic games with Sam-I-am, his grouchy friend, the fox, and other characters.

Originally published in 1960, *Green Eggs and Ham* remains a brilliant beat poetry opus. The disc captures the book's verve, and the interactive storytelling features save parents the anguish of reading their kids the story one thousand times. The thematic games provide hours of entertainment for young users, but fail to live up to the inventive genius of the prose that inspired them. While educationally sound, activities such as matching images and adding the letters B, F, and P to IG to spell BIG, FIG, and PIG, fall flat when juxtaposed with the good doctor's genius evident in the text.

Bundled with a paperback version of the book and a parents' guide that includes a recipe for green eggs and ham, *Green Eggs and Ham* is suggested for ages 3 to 7. But fans of Gertrude Stein and Jack Kerouac will be hep to this digital rendition of Theodore Geisel's best book. — *BD*

boot verdict

PRICE: $39.98
COMPANY: Living Books
PHONE: 800.776.4724
URL: www.livingbooks.com

S/W

Daggerfall

Buddy, can you spare the time?

During my time in Tamriel, there were moments when I longed for Lord British to transport me to the worlds of Ultima.

Daggerfall—Bethesda Softworks' sequel to *The Elder Scrolls: Arena*—is so immense, your first forays into this highly anticipated RPG will leave you yearning for more familiar territory. With its vast landscapes, complex characters, assorted spells, and multithreaded storyline; it takes time to realize that *Daggerfall* is special.

A boundless, complex adventure lies at the heart of the game. The game's churches, castles, dungeons, towns, and palaces are populated by a mind-boggling 750,000 characters living in 16,000 different locales.

Within the first-person perspective, reminiscent of the *Ultima Underworld* series, you use the graphical interface, keyboard, and mouse to steal, climb, throw punches, draw your sword, and cast magic spells as you explore your new world and defend yourself from its inhabitants.

Mysteries await you at every corner in this complex and vast adventure.

Even if you played *Daggerfall* for years, you might never encounter all of its 750,000 characters.

First, choose your homeland and your race. Next, develop your character traits (moral turpitude, upbringing, skills, and so on) through a multiple-choice questionnaire; or by choosing one of 18 professions, including warrior, thief, bard, burglar, assassin, knight, and archer. Your primary traits (hand-to-hand combat skills, mysticism, destruction, and such) evolve as the game progresses.

You'll need a minimum level of primary skills and a reputation (by succeeding at a guild quest, for example) to advance the story. Building your athleticism is important, because even a simple quest can require running, hiding, climbing, and swimming. The game's attention to detail is so precise that you'll drown attempting a river crossing wearing heavy armor or carrying too many weapons, if you're not strong enough. And your character's class, race, skill, knowledge, and experience determine your ability to manipulate the objects and weapons you find. If you're not an archer, for example, a bow won't be an effective weapon.

***Daggerfall* features the depth and painstaking attention to detail that makes a great RPG.**

***Daggerfall*'s battle control system is difficult to master because you must swing your weapon by whipping your mouse across your desk.**

The adventure unfolds in 16,000 different locales.

Daggerfall really suffers when it comes to combat. You'll encounter a huge number of foes (Slaughterfish, Harpies, Zombies, Dragons, and more), but it's extremely frustrating whipping your mouse around the desk to swing your sword. I died countless times trying to get the hang of this.

The best RPGs have a nonlinear path, and *Daggerfall* allows you to explore this seemingly infinite world freely, making a vast array of choices. The main quest has six beginning threads that unravel slowly. Everything you do affects the game's direction, from the spells you cast, to the characters you interact with.

Bethesda claims the *Daggerfall* world is bigger than all of Great Britain, and I believe it. Even if you're a stalwart RPG fan, you'll be overwhelmed by the enormity of this game. Complexity is its greatest strength—and its greatest weakness. But if you thirst for an adventure with an engaging story and interesting characters, *Daggerfall* will keep you enthralled for months.

— Bryan Del Rizzo

boot verdict

PRICE: $79.95; Hint book $19.95 (You'll need it)
COMPANY: Bethesda Softworks
PHONE: 800.677.0700
URL: www.bethsoft.com

boot KICK ASS! PRODUCT

PhotoImpact

We have ourselves a contender here

Just what the world needs: another *Photoshop* knockoff. Only this one isn't such a knockoff. In fact, *PhotoImpact* does stuff the king of the hill can't, while doing many of the things it can, even better.

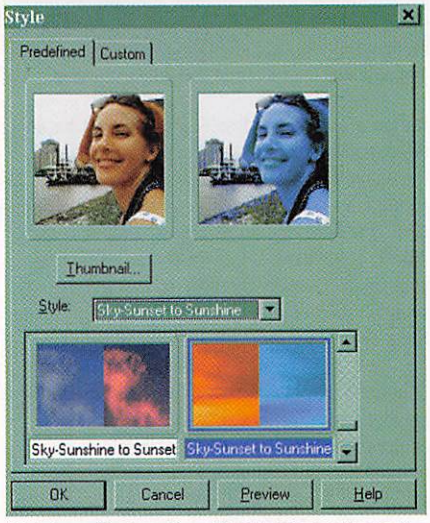
I'm not going to waste space listing every capability of *PhotoImpact* (that would probably require two whole pages); if you want a complete list, check out their Web site and click the "Facts and Features" button. Suffice it to say, if you can think it, *PhotoImpact* can do it.

If you're comfortable in Microsoft's *Office* applications, you should be right at home in *PhotoImpact*. The program emulates the *Office* environment, right down to the toolbars and menu organization, even when it runs counter to a graphics app. Still, the familiar feel is expanded where necessary. Nothing was left out to accommodate the interface.

While you can use the graphic tools in *PhotoImpact* to create art from scratch, it is at its heart an image-editing program. As such, it can import more than 35 file formats (including BMP, EPS, GIF, JPG, PCX, and TIF, as well as less common HGI, UPI, and RLE files). Images can be acquired via TWAIN-compliant scanners, imported from Kodak Photo CDs, or downloaded directly from the Internet. The program even comes bundled with its own powerful screen-capture utility.

The Warping feature gives *PowerGoo* a run for its money, and demonstrates *PhotoImpact*'s powerful previewing abilities.

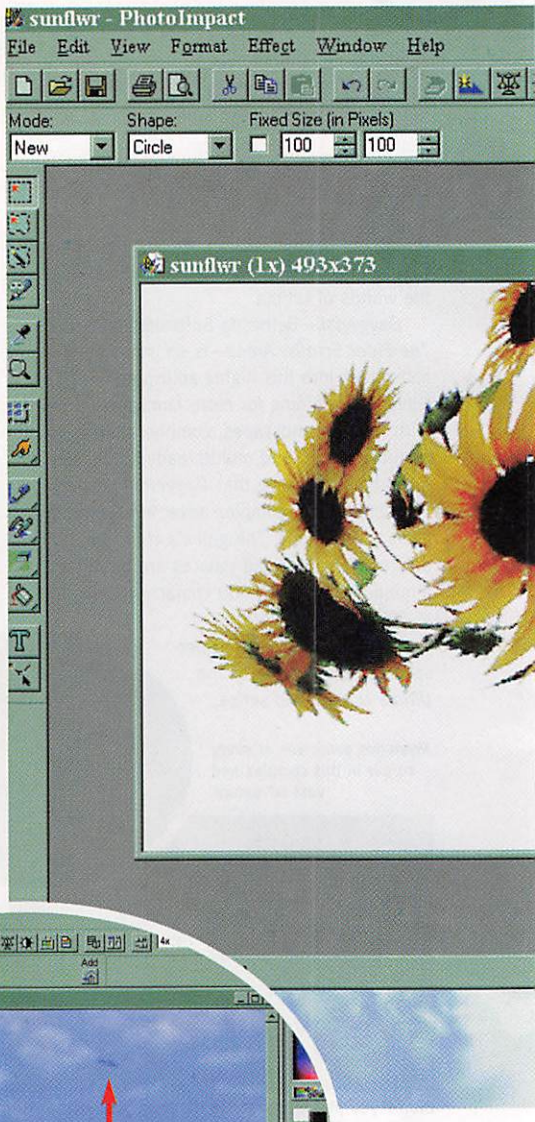
Along with the regular assortment of image adjustment tools (brightness, contrast, color cast correction, etc.), *PhotoImpact*'s EasyPalette holds Galleries of effects, textures, gradients, styles, and a user-definable gallery. The Effect Gallery contains a diverse mix of manipulations, and *PhotoImpact* accepts *Photoshop* and *Kai's Power Tools* plug-ins if you can't find what you want. The Style Gallery contains 99 predefined combinations of chroma, saturation, and intensity shifts, and additional settings can be created and saved to your Custom Folder. The Texture Gallery contains more than 700 natural textures and allows you to generate your own, all of which can be pasted into selections or applied to text.

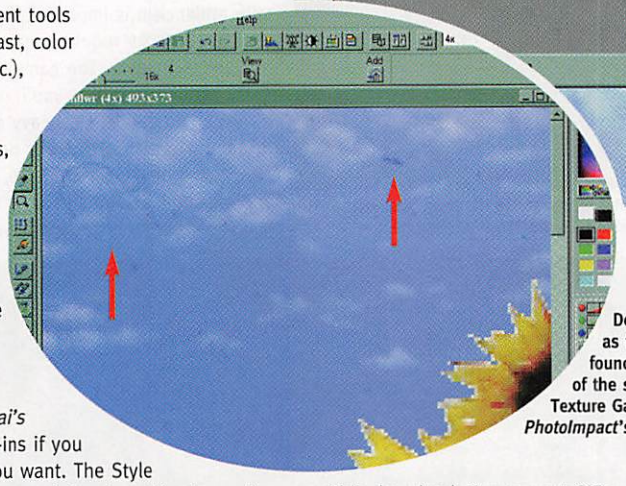


***PhotoImpact*'s slew of predefined styles can be used to creative ends.**

The Auto-Process feature facilitates the novice user as well as the lazy.

Generating images for the Web is this program's forte. Bundled with a separate disc filled with Web extensions, *PhotoImpact* is where you want to be when it comes time to create bandwidth-conscious graphics. The GIF/JPEG SmartSaver module optimizes images for the fastest possible download. Transparent GIFs are supported, along with animated GIF89 files.



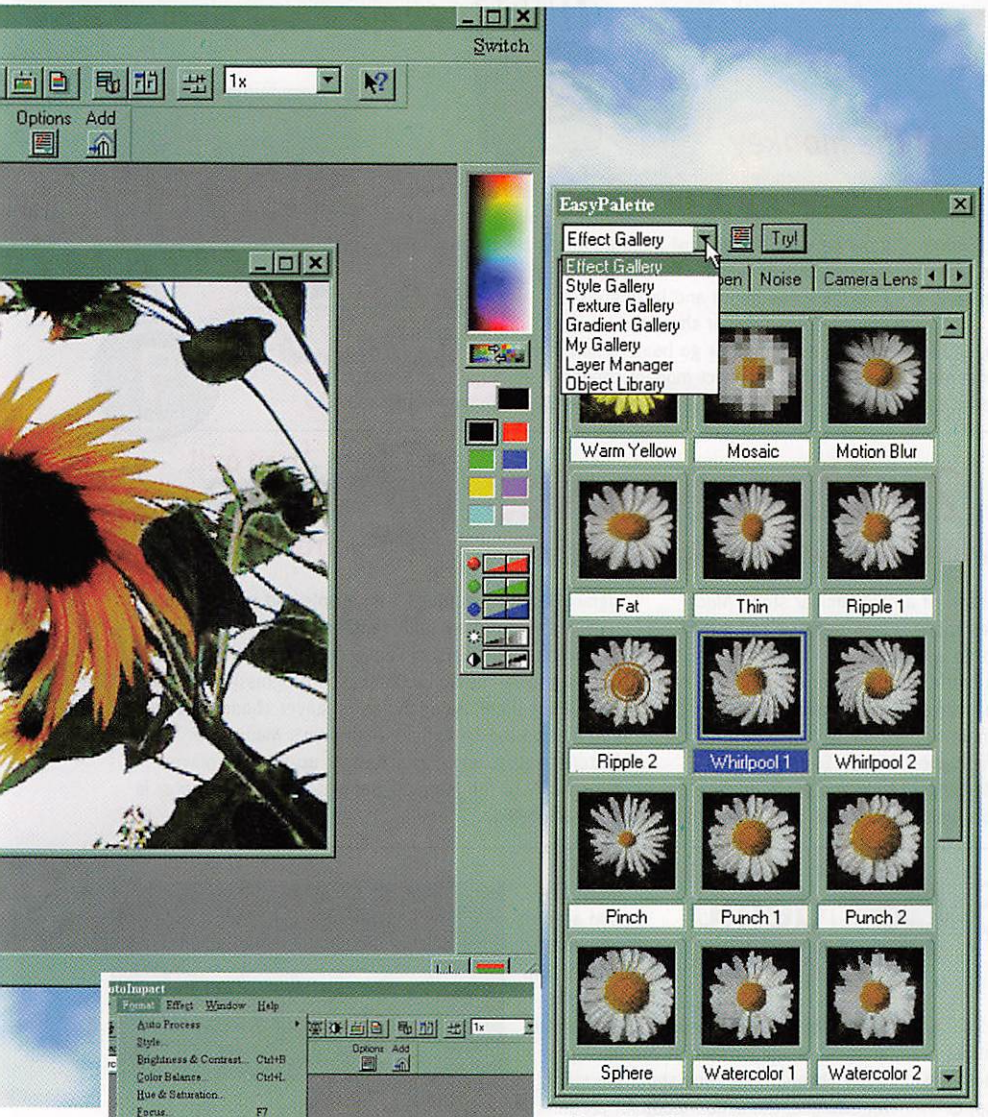


Details such as the artifacts found on some of the scans in the Texture Gallery mar *PhotoImpact*'s perfection.

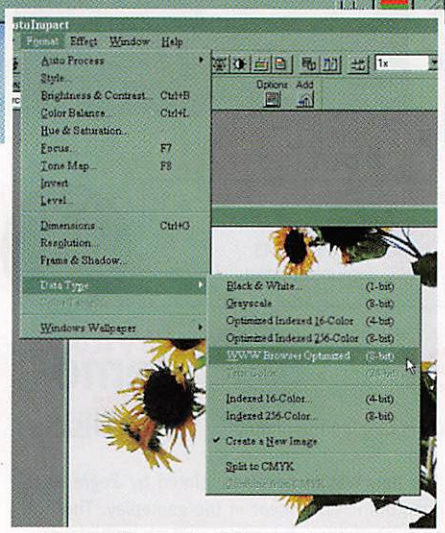
Sure there are a few blemishes in the program, such as the artifacts that litter some of the textures provided in the Gallery. It really blows to clone the crud off someone else's scans. And, shoehorned into the *Office* interface, not all the tools feel as intuitive as *Photoshop*'s.

Still, whether you're creating for the Web or for CMYK seps, *PhotoImpact* is a serious contender, and it weighs in at a few hundred dollars less than the competition.

— Brad Dosland



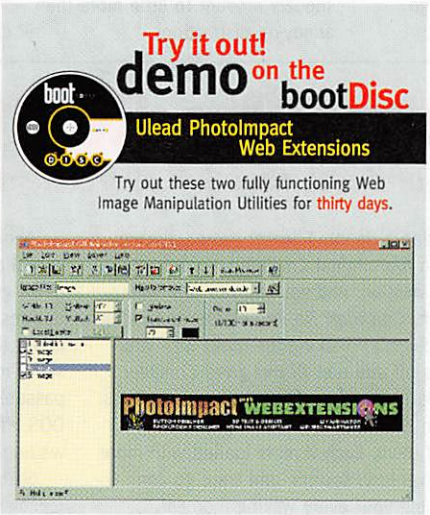
With its MS *Office*-inspired interface, *PhotoImpact* does most everything *Photoshop* does, and more.



Optimize your files for the Web with *PhotoImpact*'s special 8-bit format.

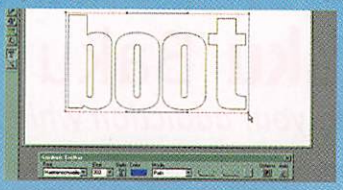
boot verdict

PRICE: $199
COMPANY: Ulead
PHONE: 310.523.9393
URL: www.ulead.com

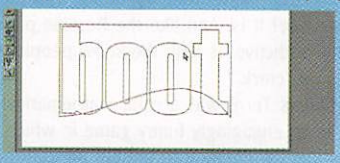


Seven steps to easy logos

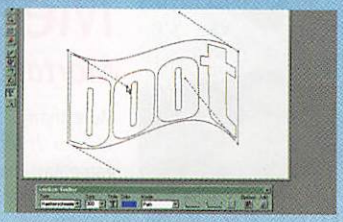
① Type in your text with the tool set to Paths.



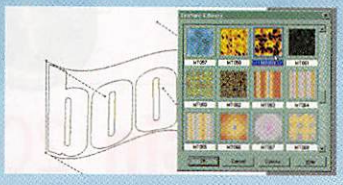
② Grab a control handle and start sculpting.



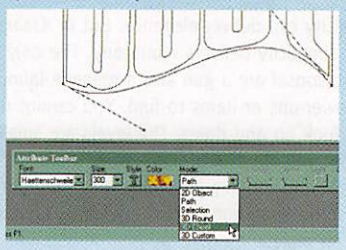
③ Text can be shaped as a unit; or by individual letter; or letters can be custom contorted by control point.



④ Select a color, gradient, or texture to apply to the text.



⑤ Change from Paths mode to one of the many 2D and 3D options.



⑥ Toss a natural drop shadow or frame outline on for effect.

⑦ *Voila*! You have one fancy, antialiased logo to pop onto your page or your site.

Baku Baku

Feed your addiction while you feed the monkey

boot KICK ASS! PRODUCT

This game is simplicity itself: Match the cartoon animal with its cuisine of choice to clear falling blocks. Clear them in quantity and plague your opponent with the fallout. Sound *Tetris*-esque? It is. And like the Russian puzzle game, *Baku Baku* is addictive as hell. We know people who refer to it simply as "crack."

Whereas *Tetris* was a cold, mathematical enigma, *Baku Baku* is an engagingly funny game in which a 3D-rendered bunny head springs up to gobble the carrots you lead it to. If the concept seems nauseatingly cute, fret not. Gameplay becomes so intense that the whimsical animations quickly grow on you. The goal of *Baku Baku* can be grasped in minutes, but the levels of possible strategy give the game depth and lasting power. You can play solo, or share the keyboard with an opponent, or go head-to-head via the Internet, direct modem connection, or LAN. — *BD*

boot verdict

PRICE: $29.99
COMPANY: Sega Entertainment
PHONE: 415.508.2800
URL: www.sega.com/segapc/

Mech 2: Mercenaries

Mortality technicians wanted. Apply within

boot disc Try it out! demo on the bootDisc

More than a mere rehash of a now-familiar story, *MechWarrior 2: Mercenaries* sports a new premise and a host of gameplay changes to go with it.

No longer do you battle for the honor of your clan; now you're motivated by a baser instinct: the pursuit of personal wealth. You'll kill for the highest bidder. Start your own Mercenary Lance and you'll manage your unit's assets and budget, including signing lucrative contracts with clients and buying parts and repairs for your mechs after each battle.

Mercenaries offers more than 60 fully customizable mechs and 30 missions. Damage is progressive—so be careful out there. And salvage whatever abandoned mechs you find on the battlefield. Activision's Multiplayer MercNet feature enables any player to host up to eight players over a LAN or the Internet. Head-to-head modem play is also supported. — *BDR*

boot verdict

PRICE: $49
COMPANY: Activision
PHONE: 800.477.3650
URL: www.activision.com

Assassin 2015

Dodge this bullet

boot disc Try it out! demo on the bootDisc

Simplicity can deliver elegance. But in *Assassin 2015*'s case, simplicity delivers monotony. The only weapons at your disposal are a gun and a grenade launcher. There are no power-ups or items to find. You cannot run, jump, or even look up and down. The levels are small and linear. To win, you need only march toward the exit of each room, blasting and strafing your enemies. The entire game is over in an hour, and its linearity leaves no reason to go back for more.

Most first-person action games boast frenetic action. In *Assassin*, the steam is constantly interrupted by elaborate 3D animations which you must passively observe. Once you shoot the robot, for example, the action stops for an animated intermission of an exploding robot. The longer cut scenes advance the story, but the little ones that litter this snoozer amount to little more than annoying distractions. — *CD*

boot verdict

PRICE: $49
COMPANY: Inscape
PHONE: 800.741.3043
URL: www.inscape.com

Crusader: No Regret

Stop, drop, and roll, then kill everyone standing

boot disc Try it out! demo on the bootDisc

You had to love playing a deadly Silencer turned against his corrupt masters in the original *Crusader: No Remorse*. You were a man on a mission. And you enjoyed your work.

This year's version, *Crusader: No Regret*, treads familiar turf. Again, you're a Silencer working the room with your deadly message: Piss off and die! *Regret* gives *Crusader* junkies 10 more levels packed with baddies and the weaponry to make short order of them. Each level is loaded with more inventory, secrets, and traps to consume your every waking moment.

About the only way to be disappointed by *Regret* is to expect a quantum improvement in the gameplay. The SVGA graphics are largely the same. Still no multiplayer options. Control is still a little jerky, the view still snaps about (instead of a smooth scroll), and the cinemas are still a mixed bag of awesome 3D rendered scenes and passably acted segues. Also, *No Regret* is still a straight DOS affair, so have all your DOS boot drivers ready and waiting or suffer the installation consequences.

Still, a night spent with *No Regret* will leave you feeling no remorse. — *BD*

boot verdict

PRICE: $29.99
COMPANY: Origin
PHONE: 800.245.4525
URL: www.ea.com/origin/

S/W

Deadlock

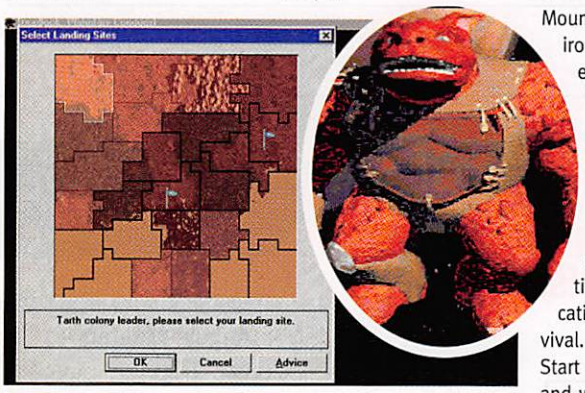
Sharing is for sissies

The untamed world of Gallius IV is rich in the natural resources that humans, and six alien races, desperately need to survive. You could share the wealth—living in peace and harmony—but what fun would that be? Assuming the role of one of these species, your goal is to colonize Gallius IV, control its resources, and gradually dominate the planet by pulverizing your competition.

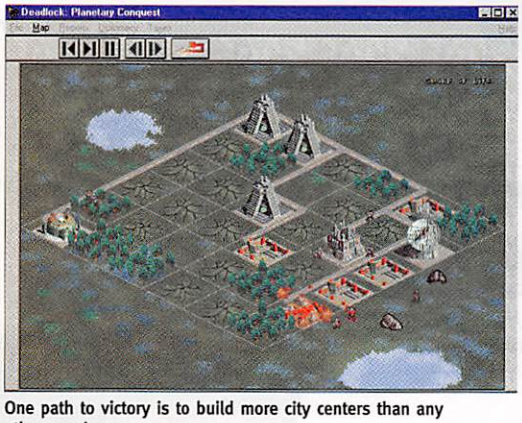
There are two paths to victory: Be a pacifist and simply build more City Centers than your opponents, or develop and use weaponry to mercilessly blow them away. The latter is more fun.

Play as a human, or one of the six other alien races: the ChCh-t, an insectoid race, capable of rapid reproduction and fast combat; the Cyth, optimists known throughout the galaxy for their atrocities against other races; the Maug, scientists with a meager immune system and low self-esteem; the telepathic Re'Lu; the Tarth, military behemoths; and the Uva Mosk, bird-like radical environmentalists. Each race's strengths and weaknesses affect the game's direction and eventual outcome.

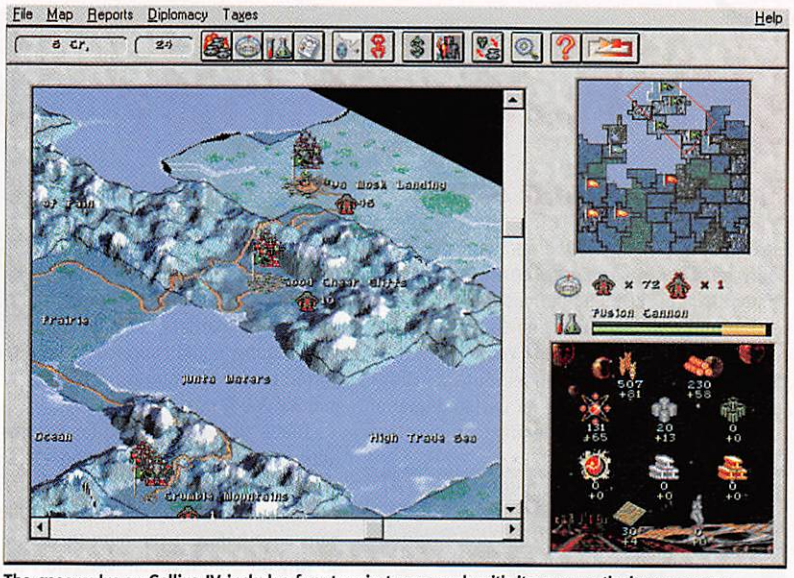
Begin your first colony on one of the four terrain types: plains, forest, mountains, or swamps. Plains are ideal for starting a large population, and they produce the most food. Forests possess all natural resources, but only in moderation. Swamps have harvestable energy, but lack the minerals needed to build up your arsenal. Mountains are perfect for iron-ore deposits, but energy and food are tough to produce there.



In *Deadlock*, humans and six other species battle for control of the resource-rich planet Gallius IV.



One path to victory is to build more city centers than any other species.



The geography on Gallius IV includes four terrain types, each with its own particular resources.

You'll want to colonize as many territories as possible. But given half a chance, you'll also want to eradicate your opposition. Research and education are the key to survival. Educate to annihilate! Start off by researching food and wood technologies (which lead to faster food production), but you will need iron, antimatter, and endurium technologies to protect the colony. New technologies (such as nuclear fusion and synthetic fertilizer) will improve energy and farming. Building airports and missile bases early helps both defense and offense.

Keep the war effort going and research new weapons, because you'll soon find out your laser cannons are no longer a match for enemy fusion or disruptor fire. Don't neglect your colonists—you want them happy, well-fed, educated, reasonably taxed, and above all, alive.

During each turn you'll need to decide which technologies to research in order to increase your chance of survival.

At the heart of *Deadlock*, a very slick toolbar allows you to zoom in on any of your territories, or spy on your opponents. You can also receive combat reports and colony stats, modify tax rates, or upgrade your research and technologies. This intuitive interface allows you to annihilate whole neighborhoods with just a simple click of your mouse.

Deadlock supports a multitude of multiplayer options, including serial link, network, modem, and Internet. During the game your alien neighbors will bombard you with countless verbal assaults, including braggarts spying on your colony and aliens uttering contemptuous threats. During multiplayer mode, you can taunt other players from a predetermined list, or type in your own.

If you loved *Master of Orion*, *WarCraft II*, and *Command & Conquer*, add *Deadlock* to your collection. Accolade has done a supreme job of bringing together all the elements necessary for a compelling, addicting strategy/war game.

— Brad Craig

boot verdict

PRICE: $59.95
COMPANY: Accolade
PHONE: 800.245.7744
URL: www.accolade.com

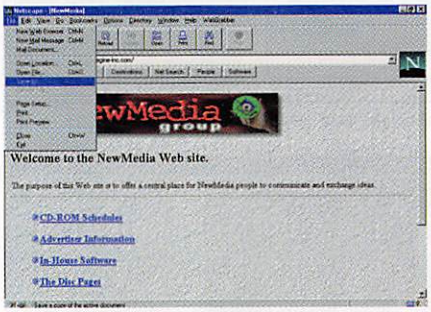
S/W

Web Grabber

Grab something else

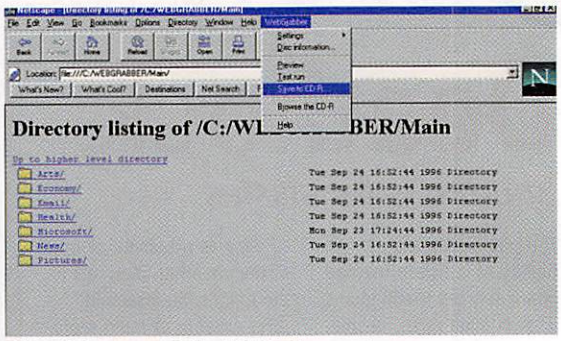
Elektroson bills *Web Grabber* as the first-ever software utility to seamlessly download Web content to a CD-ROM. Sound cool?

The utility appears as a pull-down menu with Netscape's *Navigator*, enabling you to master a disc without leaving the browser. Such functionality helps Netscape achieve its unstated goal of turning *Navigator* into an operating system. *Web Grabber* uses Elektroson's popular *Gear* CD-R mastering software at its core, and since *Gear*'s strength lies in cross-platform compatibility, *Web Grabber* could conceivably be ported to any platform capable of running *Navigator*.



It's still necessary to use *Navigator*'s limited save features—*Web Grabber* doesn't add anything new here.

That's all well and good for Elektroson and Netscape, but the benefit to end users is less clear. Like any CD-ROM mastering software, *Web Grabber* requires that you save your files to your hard drive before it can burn them to a CD-ROM, so why do it from within *Navigator*? If *Web Grabber* was capable of sucking down Web sites and data from ftp directories and writing it directly to a CD-R drive, burning a disc from within a browser would make sense. But it isn't. If *Web Grabber* only augmented *Navigator*'s Save command, enabling it to grab an entire Web site with a few simple commands, it would make sense. If *WebGrabber* was capable of burning in the background instead of tying up *Navigator* until the disc is burnt, using it instead of mastering software would make sense. But it doesn't.



This pull down menu is the *Web Grabber* experience.

This leads us back to the question: Why would anyone need to burn a disc while they're browsing the Web? I asked Elektroson the same question, but I haven't heard back from them yet. Maybe they're also trying to figure out why they made this product.

— Sean Downey

boot verdict

PRICE: $79.95
COMPANY: Elektroson
PHONE: 408.371.4895
URL: www.elektroson.com

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Risk and **Battleship**, priced at $39.99 each, are two of the best war games of all time, and Hasbro has finally brought them to the PC in a manner that does these classics justice. The Battleship CD-ROM will blow you out of the water with high-res, 3D graphics; non-stop action; and real-time gameplay over a LAN or the Internet. Game elements will include: fleet maneuvering, antimissile defense, incoming missile alerts, and fleet repair.

Risk will feature rendered graphics, realistic battles, and Internet modes so you can conquer the world for real. Set during the Napoleonic era, the game map will consist of the entire globe, not just Europe; and will feature realistic terrain, forests, fortifications, capital cities, and naval warfare. Play as one of history's greatest commanders, or make up your own conquering hero.

Hasbro Interactive: 508.921.3700; www.hasbro.com

PC Jock Strap

Time is precious. Don't waste it looking for pens, pencils, scissors, and the like. Stick the **Computer Utility Cup** on the side of your monitor and clear away desktop clutter once and for all. Tastefully styled in putty-colored ABS plastic, the Cup features a unique suction cup and articulated arm that will hold your tools at any angle, but always at your fingertips. Modestly priced at just $13, look for the Cup at better office-supply stores. Don't compute without it.

Zelco Industries: 800.431.2486; www.zelco.com

Remember When?

If you're having problems remembering events from history, then Pantheon Multimedia and EMME Interactive's **Greatest Moments of Our Time** may be able to help. Compiling more than 60 major events, the $39.95 CD-ROM includes footage of the first flight at Kitty Hawk, Edison in his laboratory, and Martin Luther King's March to Washington D.C. More than 100 minutes of rare film footage are included, as well as full narration and in-depth articles.

EMME Interactive; 800.424.3663; www.emme.com

Can I Buy Just the Stand?

The **EFI XJ+500**, from Electronics for Imaging, allows Xerox's DocuColor 40 Digital Color Production System to be used as a high-speed, full-color printer for office networks. The EFI XJ+500 can process data at 40MB per second and can print 40 single-sided pages per minute or 30 double-sided pages per minute. Print speed is considered an industry breakthrough because it is five times faster than normal color copiers or printers.

An integrated Command WorkStation (pictured) interface provides advanced controls at the server, and has new, easy to use document printing features. It better—especially with a less than paltry $62,000 price tag.

Xerox Corporation; 716.423.5230; www.xerox.com

Look Ma, No Hands!

With UMAX Technologies' **PowerLook 2000**, you don't have to be a color scientist to get consistently great scans. For graphics professionals pressed for time, and graphic novices who want professional results, the PowerLook 2000 offers many unique features, including automatic color correction, batch and multiple scanning modes, and a resolution of 1000x2000dpi. The PowerLook 2000 also includes an optical system and cold cathode lamp for durability and dust-free images. And it's priced at only $5,495. Better hope they throw in a set of Ginsu knives as well.

Umax Technologies; 510.851.4000; www.umax.com

Global Peace Through Deadly Force

Fighter pilots, prepare for the most true-to-life flying experience with Mission Studio's new **JetFighter III** combat simulation program. You'll fly over 3.5 million square miles of real-world 3D terrain in an authentic 3D virtual cockpit, using advanced tactical aircraft including the F-22N Lightning II and the F/A-18 Hornet. More than 90 death-defying missions are included with the $49.95 street price. Parachute not included.

Mission Studios; 847.991.0598; www.missionstudios.com

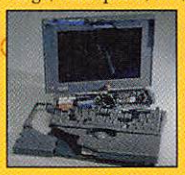
Stick 'em Up

True gaming gurus will tear through their favorite computer games with the 20 function programmable **F-16 FighterStick** from CH Products. With the look and feel of a real F-16 jet stick, the F-16 FighterStick features an eight-way hatswitch, three four-way switches, three push buttons, and a trigger control for $189.95. As a stand-alone joystick it provides 16 programmable functions and four buttons; but if you use it in conjunction with CH's Pro Throttle, you'll have access to a total of 40 programmable functions and 400 macros. The F-16 FighterStick is fully digital, and works with both DOS and Win95 games.

CH Products; 619.598.2518; www.chproducts.com

Who Ya Gonna Call?

DriveSavers offers 24-hour turnaround service for rescuing data on troubled laptops, hard drives and optical disks. If you ever lose data because of a power surge, earthquake, fire, flood, or a swarm of disk-eating locusts, just call DriveSavers, who'll give you a recovery estimate over the phone. The recovery is usually completed (and the finished job shipped back to you) the same day it's received. The firm boasts a data-recovery success rate of 95 percent, but there's no word yet about the recovery rate for notebooks damaged on the new high-tech luggage system at Denver's International Airport.



DriveSavers; 800.440.1904; www.drivesavers.com

When Eight Just Isn't Enough

For only $399, Diamond's new **12X PNP Multimedia Kit** includes a Mitsumi 12x CD-ROM drive, a 16-bit wavetable sound card, nine games, six audio utilities, and amplified speakers. The MPC3 compliant IDE 12X CD-ROM has a sustained transfer rate of a whopping 1.8MB/sec, and an average access time of 130ms. The bundled software includes such titles as Virtua Fighter PC, Myst, Comptons 1996 Interactive Encyclopedia, Magic Carpet, and Corel Draw 4.

Diamond Multimedia; 800.468.5846; www.diamondmm.com

This Is Not a Toy

If sound quality is your top priority, then you must hear Digital Audio Labs' **CardDplus**, a professional, high-fidelity, dedicated recording and playback card for the PC. With impressive features such as the dual 16-bit Delta-Sigma A/D converter, 92dB dynamic range, .003 percent total harmonic distortion, and 20Hz to 20kHz frequency response, the CardDplus is the perfect match for your favorite editing, multitrack, and MIDI sequencing programs. You can also add the I/OCardD allowing you to add S/PDIF digital interfacing to and from your DAT or other outboard converters. The CardDplus is priced at $795 with the I/OCardD for an additional $295.

Digital Audio; 612.559.9098; www.digitalaudio.com

This 'Aint No Snappy

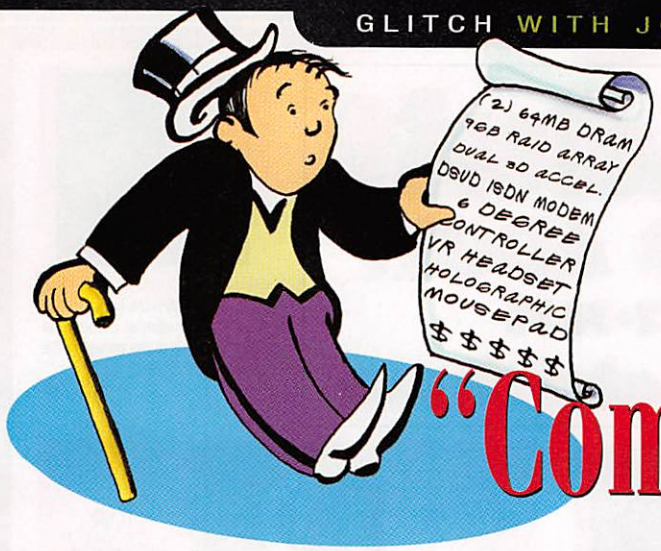
The **Pixera Visual Communication System** is actually a multifunction digital camera capable of producing 24-bit color images in resolutions up to one million pixels. Both the professional and personal versions include the camera; PCI interface card, system level software (for image processing); and other image capture, enhancement, and management software. The combination of the optical and software processing software can quadruple the resolution of the camera's image sensor equivalent to a monitor display of 1152x864. The personal system employs a fixed focus lens and is priced at $795. The professional system uses a standard C-mount variable focus lens and is available for $1,195.

Pixera; 408.342.0110; www.pixera.com

And a Hiking We Will Go

You'll never have to worry about backups again with the backpack **800TD**, a 800MB tape drive that plugs directly into the parallel port (you can plug your printer into the back of the 800TD using the pass-through connection). The 800TD is Plug-and-Play compatible with Win95, and works with a wide variety of storage cartridges. The backup speed is roughly 9MB/minute (compressed) or 4MB/minute (uncompressed). The 800TD is ruggedized for transport, and includes a detachable data cable, wall-plug transformer, and backup software for only $139.

MicroSolutions; 800.890.7227; www.micro-solutions.com



Francis Buys a "Computing Device"

The top hat and tails nearly threw the salesman off his rhythm. Most customers came in wearing T-shirts and jeans, but this guy looked like the Monopoly Man. The salesman was still trying to make sense of the funky cane when Francis began spewing demands.

"Good day, my fine concessionaire. I'm here to purchase a computing device. It must be able to compile and correlate large amounts of data. It must be able to perform rapid and complex calculations. The device must be, as they say, state-of-the-art. I expect solid-state circuitry, and I'll accept nothing less. My technology mentor suggested that I investigate a 'two-eight-six.'"

"That's 286," said the salesman, "and we don't have any."

"Quite. Your hobbyist jargon notwithstanding, you surely must have at least *one* spirited away somewhere, perhaps reserved for your more, oh, shall we say... *discerning* customers?"

"Listen, pal, I ain't seen a 286 since I quit the DMV. You're gonna have to upgrade."

Upgrade. Upgrade. *A better product for a better man.* Francis liked the sound of where the conversation was heading.

"So be it," he said with only perfunctory protest. "What kind of device do you recommend?"

"Depends on your applications," said the salesman. "What do you need the machine for?"

"Text conversion," said Francis. "I have reams and reams of dissenting arguments to a number of high-profile civil decisions. These hand-written monographs must be converted to electronic format so that I may submit them to the Harvard Law School. Its journal is anticipating my submissions as we speak."

"You work downtown, huh?"

"I watch *Court TV*."

Both men paused.

"Text conversion. Gotcha." The salesman began punching together a purchase order. "OK, we'll set you up with a good word processor. What about games? You much of a gamer?"

"I occasionally enjoy a soothing round of Yahtzee."

"You know, we've got a computer version of Yahtzee. Comes bundled with *Solitaire* and a *Space Invaders* clone. Kicks the pants off anything you got at home."

Francis began to daydream. He had heard rumors of electronic Yahtzee. Fast, convenient. No more wayward dice landing in his pudding dish.

"I'll take it."

"OK. OK. OK. OK." The salesman stalled while punching more items into the purchase order. "What about the Internet?"

"I'm sorry?"

"The Internet. The *In-ter-net*. You know, the Web, newsgroups, chat rooms."

"Oh yes," said Francis, "your so-called 'information superhighway.' Nothing but smoke and mirrors. Charlatan quackery. Snake oil for the modern era. I'll have nothing to do with it."

"You say you watch TV, huh?"

"I do."

"*Lois & Clark*?"

"Occasionally."

"Well, let me tell you something, mister. You get on the Internet, and you'll find entire catalogs with nothing but nudie shots of Teri Hatcher. *In the buff*, mister. In the buff."

"Rather!"

"Hey, suit yourself."

"I will, thank you. Quite. Quite. Quite... Quite. Nevertheless, these catalogs may be apropos to a scathing indecency suit I'm currently constructing. Yes, they may be just the elixir for which my suit has been longing. Indeed, sir, by hell or highwater, make me Internet-enabled."

Upgrade. Upgrade. *A better product for a better man.* Francis liked the sound of where the conversation was heading.

"I'll make it happen," said the salesman, now adding to the purchase order in earnest.

Negotiations continued apace as Francis and the salesman pieced together a system suitable for Francis' compelling needs. Memory, add-on cards, peripherals, software suites—the salesman explored every avenue, lest Francis return home with an inadequate "computing device."

The salesman presented Francis with the bill.

Francis gasped. If he had been wearing a monocle, it would have dropped to the floor. He gingerly folded the bill in half, and placed it on the counter.

"My fine concessionaire," said Francis, "I believe I would like to explore, oh, shall we say... *alternative* solutions?"

Postscript

The municipal bus rumbled through downtown traffic. Francis sat in the seat directly behind the driver, and submerged the poor man in tales of his proud purchase.

"Two-hundred fifty-six kilobytes of memory. One-thousand eight-hundred seventy-five LCD pixels, each and every one of them zealously committed to my beck and call. The concessionaire, of course, tried to trumpet an inferior device, but I would have nothing of it. 'I require a personal digital assistant,' I told the rogue, 'and a personal digital assistant I will have.'" b

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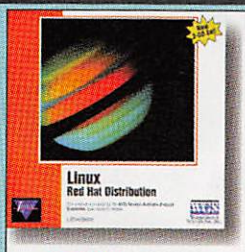

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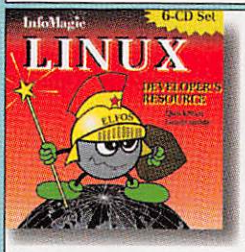

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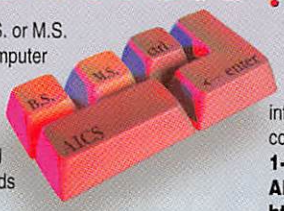

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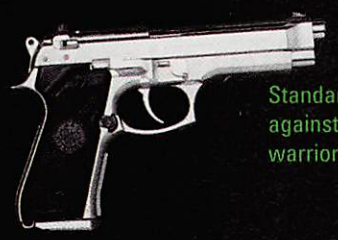

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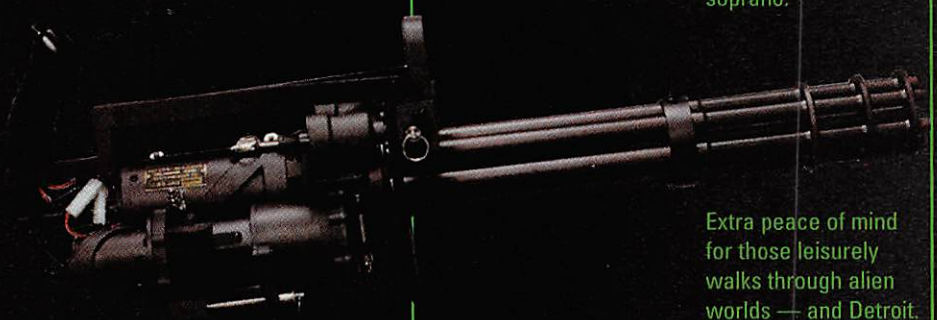

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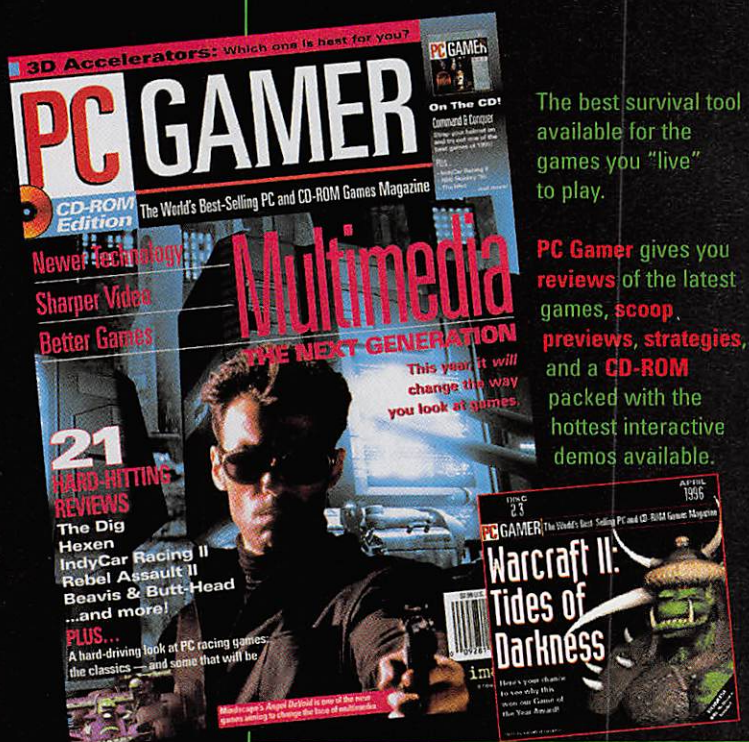

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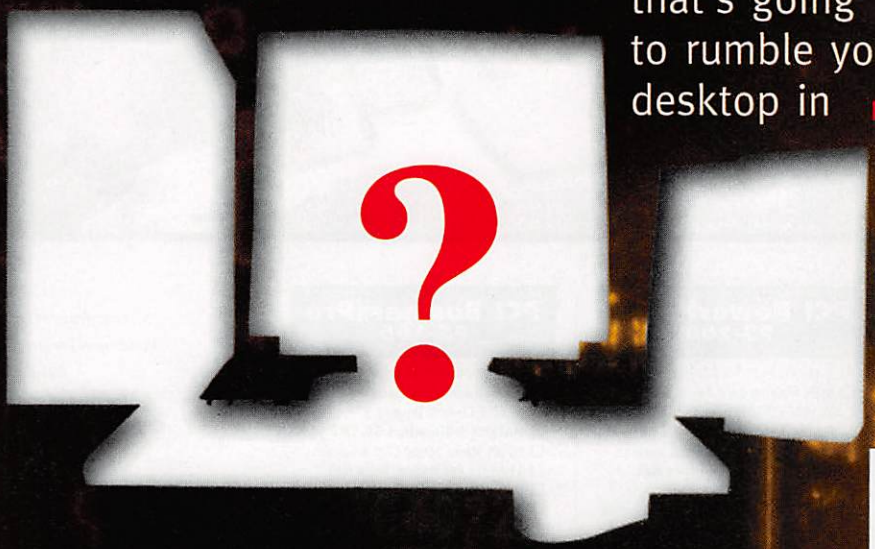

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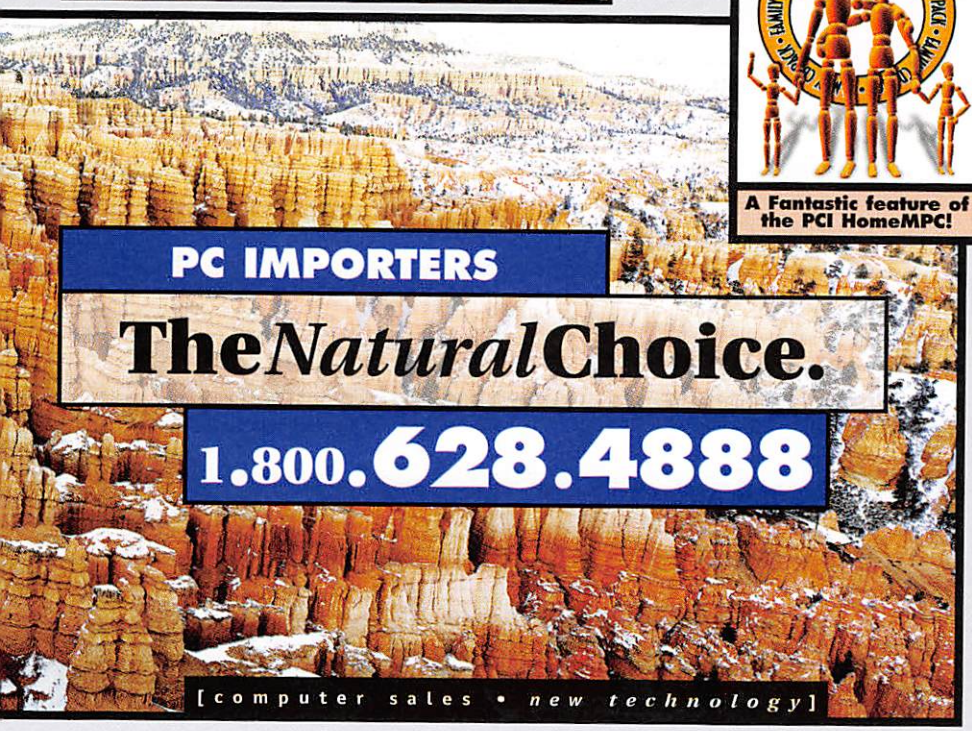

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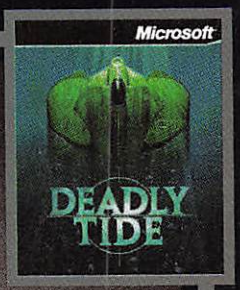

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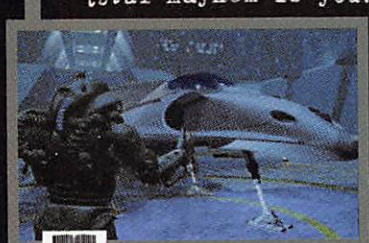

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