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PC GAMER
VOLUME 7 • NUMBER 2 • FEBRUARY 2000

Half-Life: THE NEXT WAVE p.49

Cover Illustration by Dhabih Eng, Valve Software

Cover Story

49 Eager to hear more about *Team Fortress 2*? No problem, we got it right here. Keen to check out *Opposing Force* and get a step-by-step playing guide? We got you covered on page 166! Dying for news on *Half-Life 2*? We can accomodate you. Interested in some of the hottest mods and conversions for *Half-Life*? You've come to the right place. Well, what are you waiting for? Dive in!

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Roleplaying Apocalypse

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Game design legend Warren Spector is about to shock and amaze us once again with this action/roleplaying hybrid.

20 **High Heat 2001**

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23 **Rogue Spear: Urban Operations**

Does this expansion pack look good? You bet it does.

24 **Hitman**

Take on the role of an assassin-for-hire in Eidos' upcoming action game. Going to "work" has never been more fun!

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Once again, the issue of videogame violence rears its ugly head.

200 Backspace
LucasArts' Tim Schafer is the latest developer blindfolded and put up against our bullet-scorched wall.

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Letter from the Ed.

I'm so sorry, he's from Barcelona.

It's been a year since the classic *Half-Life* arrived on the scene to forever redefine action gaming, but sometimes it still seems like it was only yesterday. Particularly this month, as the *PC Gamer* crew found itself fully re-immersed in Valve's groundbreaking game via a whole glut of amazing new *Half-Life* follow-ups and add-ons. Even Jay the Jackal, our resident *Team Fortress* maven, was seen to visibly brighten his demeanor as he surveyed the Gaming Goodness soon to be headed his way in the form of *TF2*. "Excellent," he cackled, "even more opportunities for me to terminate the putrid scum with whom I am forced to share my personal space on a daily basis." Whaddaguy!

Okay, so Mark Pezzetta from Fair Lawn, NJ, wins a copy of *Homeworld* for being the first person to E-mail me with the correct source of last month's headline quote — it was, as so many of you subsequently guessed, from *The Hitchhiker's Guide to the Galaxy*.

This month I'm giving away a copy of *Unreal Tournament* to the first person to E-mail me at *gary@pcgamer.com* with the source of this month's headline (above). And let me give you a hint...if you're E-mailing me after the 10th of the month, forget it... someone already got there first, believe me. Good luck....

Gary Whitta, Editor-in-Chief

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HARD STUFF

THE HARDWARE GUIDE THAT DOESN'T PULL ANY PUNCHES

FEBRUARY 2000

MOTION BLUR:
Smooth motion to improve image quality or to exaggerate motion for special effects...just one of the hot new features you'll see in the new Voodoo5s. (Artist's conception)

The New Voodoos...

Blurring the Line Between Graphics and Reality

Home Network:
Diamond has a solution that is perfect for gamers and small businesses alike.

Control Yourself!
Saitek and Gravis have two new controllers. Are they worth the cash? Details inside.

Hot Reviews:
Four new sound cards from Aureal and Creative Labs that'll rock your world!

HSCONTENTS

Porn to Party in Las Vegas

Having just returned from Las Vegas, home of this year's Comdex convention, I must inform you all that I have a new favorite vacation spot. I don't know if it was simply because 250,000 computer geeks had flooded the city for the one-week tech-fest, and the populous just wanted to cash-in on our collective single-ness (we tech guys tend to be single for some strange reason), but in addition to the computer hardware being shown in the convention centers, there was porn for as far as the eye could see.

Here in the bay area we have newspaper vending machines that dispense erotic papers to passers by willing to cough up a buck or two for a quick fix (er, or so I've been told), but in Vegas, these type of papers are free — and they're much more explicit. And even if you don't want to look at them, you can't help but get sucked in because there are more copies of these periodicals cluttering the streets and walkways than there are cars and pedestrians!

When I wasn't looking at porn or losing the shirt off my back in a poker game, I did manage to pop into the convention centers from time to time to see what all the hubbub was about. I saw a lot of great things, but the coolest information I walked away with was the specs for 3dfx's new Voodoo4 and 5 lines of video cards. All built using the same core chip(s), the new Voodoos are a bit different from what I was expecting — look to our preview on page 135 for details. Oh, and hey...nobody tell my mom about any of this porn stuff, okay?

Greg Vederman, technical editor

The New Voodoos...

3dfx has finally broken its silence on the upcoming Voodoo4 and Voodoo5 and we've got the information you crave including specs, pricing, and availability. Interested? We thought so. PAGE 135

REVIEWS

- ***GRAVIS XTERMINATOR DUAL CONTROL*** ..... PAGE 138
  Similar to Mad Katz's Panther XL, the Dual Control makes some changes to the traditional joystick with impressive results.
- ***DIAMOND HOMEFREE NETWORK*** ..... PAGE 138
  Looking for a new way to network your PCs? Diamond has the goods to get you up and running with ease.
- ***SAITEK P120 GAMEPAD*** ..... PAGE 139
  If you're in need of a comfortable, inexpensive gamepad, Saitek's latest fits the bill.
- ***SAITEK R100 RACING WHEEL*** ..... PAGE 139
  Looking a heck-of-a-lot like Microsoft's excellent racing wheel, the R100 feels good and has a price that won't break the bank.
- ***AUREAL SOUND CARDS*** ..... PAGE 140
  Aureal goes out on its own and releases two new sound cards. Do they stand up to the competition?
- ***CREATIVE LABS SOUND CARDS*** ..... PAGE 140
  Like Aureal, Creative has just launched a new line of sound cards. Aureal or Creative: Which one will you choose?

How We Rate the Hard Stuff

You've been around long enough to know the greatest technology doesn't mean a thing unless it improves the games you love to play. Our reviews focus on real-world testing, but when a number is in order for comparisons, we use the benchmarking tools developed by our hardware-frenzied sister publication *Maximum PC*. Between our testing and the BenchMarks, we'll give you the lowdown on which devices perform and which ones fizzle.

PC Gamer's Editors' Choice Awards

Every month, we honor the best peripherals, utilities, and hardware we test with our Editors' Choice award. So when you see the *PCG* Editors' Choice logo on hardware at a local computer store, you can be sure it's among the best.

PC GAMER EDITORS' CHOICE

TRINITY

Check out all the up-to-date parts and prices *PC Gamer* recommends for low-end, mid-range, and high-end systems! ..... PAGE 143

TECH Q&A

The reports of Dear Greg's death have been exaggerated. In-line with the new format, this month's tech Q&A will be accompanied by a single Dear Greg letter. Is it a doozie? You bet!... PAGE 144

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Gratuitous Violence is 200 Times Faster With a D-Link Network Than With Online Games.

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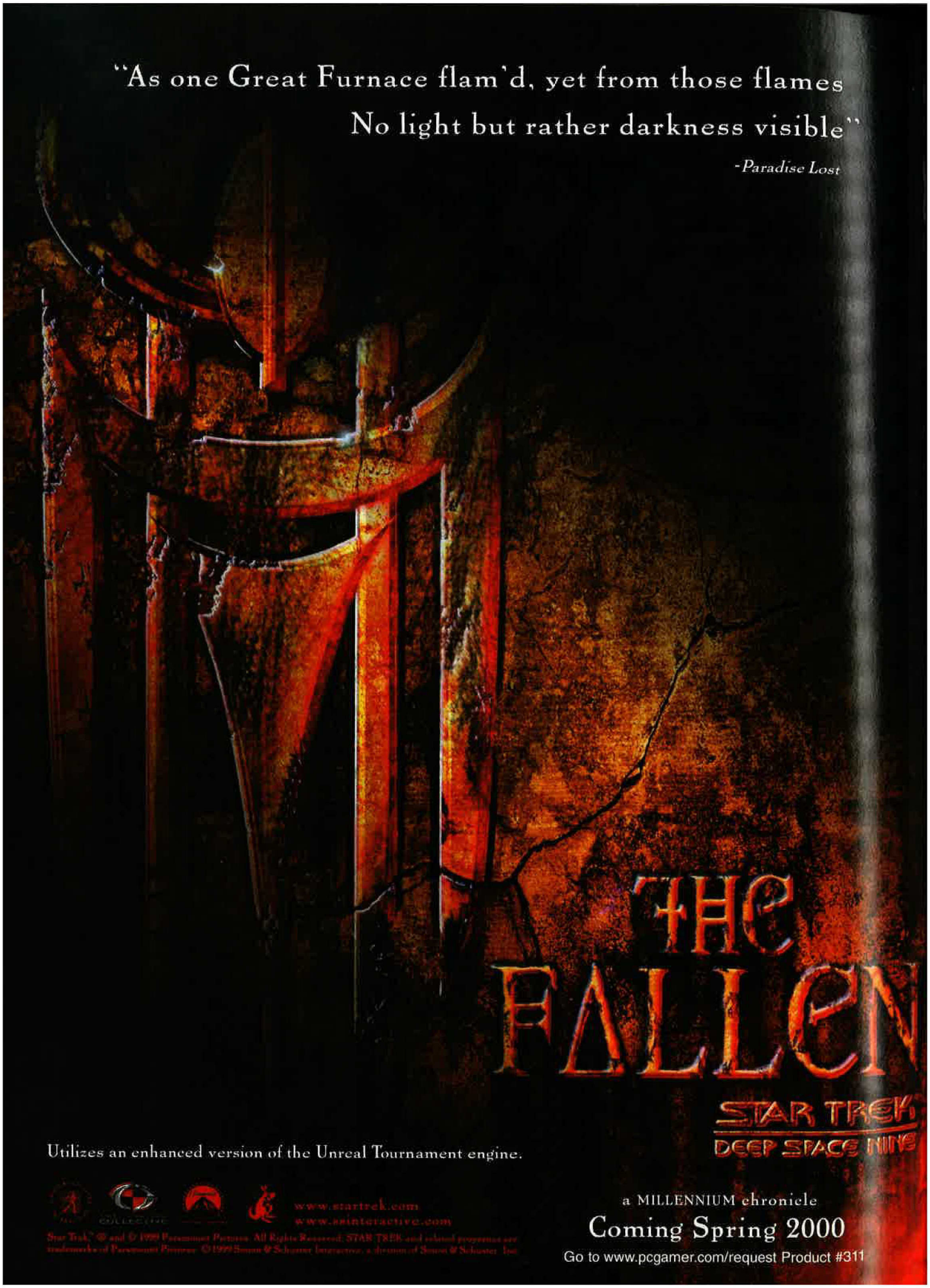

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The New Voodoos

3dfx officially announces Voodoo4 and 5 at this year's Comdex in Las Vegas

Of all the appointments we had at this year's Comdex convention in Las Vegas none were more important than getting to the Venetian Hotel's wax museum bright and early on the morning of November 15th. This was the spot that 3dfx had chosen to announce its new Voodoo cards, and we weren't going to miss it for the world.

Among other things, we learned that Voodoo4 and 5 (formerly known as Napalm) will actually hit the streets concurrently (give or take a couple weeks) during the first quarter of 2000. We also learned that, contrary to rumors, 3dfx did not implement any sort of T&L engine (similar to the one in the GeForce) into this generation of accelerators. Expect that feature to come a bit later down the road.

Without T&L, do these cards have what it takes to be GeForce 256 killers? It's too tough to tell right now, as even at this late date, 3dfx has yet to receive preliminary hardware samples; and everything we've been shown thus far has been running on emulation systems. Let's just put it this way: 3dfx has been blowing the fill rate horn long and hard for the past several months, and on paper, some of the Voodoo5s offer the most outrageous fill rates we've ever seen. If 3dfx ends up delivering what it has now promised, 2000 is going to be one hell of a year for 3D graphics.

The Voodoo5 6000 draws so much current that it requires its own power adapter to assure reliable operation.

3dfx announced 5 different SKUs at Comdex. Below is a list of what they are and how much you can expect to pay for them. Look to these pages for even more information in the coming months.

GLOSSARY

VSA-100: Short for Voodoo Scalable Architecture, this is 3dfx's newest Voodoo chip. It is everything that Voodoo 3 was and more. As many as 32 VSA-100 chips can be used in parallel, each one with as much as 32MB RAM. In multiple-chip solutions, a new SLI-like technology is employed to make all the chips function together. The one downside is that each chip in a multi-chip card will have to repeat the same texture information, thus cutting down a bit on actual usable memory.

FXT1 and DirectX Texture Compression: FXT1 is 3dfx's own, totally free texture compression technology. DirectX Texture Compression is the version of S3's S3TC that is integrated into DirectX (DXTC). Both technologies allow for higher resolution (better looking/less fuzzy) textures by greatly reducing memory bandwidth. Without either of these two technologies, large texture support in true 32-bit color wouldn't be possible on the hardware of today given current memory constraints.

2k x 2k textures (large texture support): All Voodoos up until the 4 and 5 only supported a maximum texture size of 256x256 pixels, thus making most textures in games look fuzzy and washed-out. The new Voodoos support textures as large as 2,048 x 2,048 pixels (2k x 2k, for short), and so games that are made with these larger textures will look much prettier.

Real-time full-scene hardware anti-aliasing: Just about every video card out there claims to anti-alias, but the truth is, in almost every case it's merely a software-driven driver hack that eats up a lot of CPU cycles and that doesn't even look very good. In order to add true hardware-based full-scene AA (whereby jagged lines and flashing objects are removed from 3D images), the Voodoo card in question must have at least 2 VSA-100 chips, and that's why only the Voodoo5s support this feature.

T-Buffer Digital Cinematic Effects (all done in hardware):

A) **Motion Blur**: Common in television and film, motion blurring is one of the main reasons why the human eye can't tell that the images on-screen are only being updated at 24 frames per second. Because computer animation doesn't rely on this feature, considerably more frames must be rendered each second for us to perceive fluid motion.

B) **Depth of Field Blur**: Also common in TV and film, this effect creates a more realistic image on-screen by blurring all but the most important objects in a scene — just as a real camera lens would. Game developers will have full control over what objects are in focus and which ones aren't.

C) **Soft Shadows**: Yet another effect that attempts to bridge the gap between computer games and cinema, this effect adds soft edges to shadows to give them a much more realistic appearance.

All new Voodoos share the following features:	Voodoo4 4500 PCI and AGP (2X/4X without AGP texturing)	Voodoo5 5000 PCI	Voodoo5 5500 AGP (2X/4X without AGP texturing)	Voodoo5 6000 AGP (2X/4X without AGP texturing)
Fully integrated 128-bit 2D/3D video accelerator	Single VSA-100 Processor	Dual VSA-100 Processors	Dual VSA-100 Processors	Quad VSA-100 Processors
FXT1 and DirectX Texture Compression	32MB SDRAM	32MB SDRAM	64MB SDRAM	128MB SDRAM
32-bit rendering	Fill Rate: 333-367 Megapixels per second (dependent on final speed of chips)	Fill Rate: 667-733 Megapixels per second (dependent on final speed of chips)	Fill Rate: 667-733 Megapixels per second (dependent on final speed of chips)	Fill Rate: 1.32-1.47 Gigapixels per second (dependent on final speed of chips)
32-bit textures	Expected Price at Retail: $179	Real-time full-scene hardware anti-aliasing	Real-time full-scene hardware anti-aliasing	Real-time full-scene hardware anti-aliasing
24-bit Z-buffer		T-Buffer Digital Cinematic Effect: Motion Blur	T-Buffer Digital Cinematic Effect: Motion Blur	T-Buffer Digital Cinematic Effect: Motion Blur
8-bit stencil buffer		T-Buffer Digital Cinematic Effect: Depth of Field Blur	T-Buffer Digital Cinematic Effect: Depth of Field Blur	T-Buffer Digital Cinematic Effect: Depth of Field Blur
2k x 2k textures (large texture support)		T-Buffer Digital Cinematic Effect: Soft Reflections	T-Buffer Digital Cinematic Effect: Soft Reflections	T-Buffer Digital Cinematic Effect: Soft Reflections
350MHz RAMDAC		Expected Price at Retail: $229	Expected Price at Retail: $299	Expected Price at Retail: $599
API support: DirectX, OpenGL, and Glide				
Driver Support: Windows 95, 98, NT4.0, and Windows 2000				

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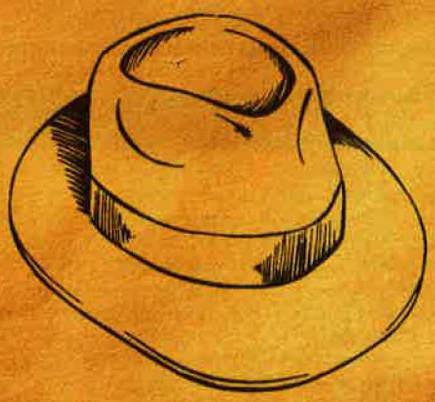
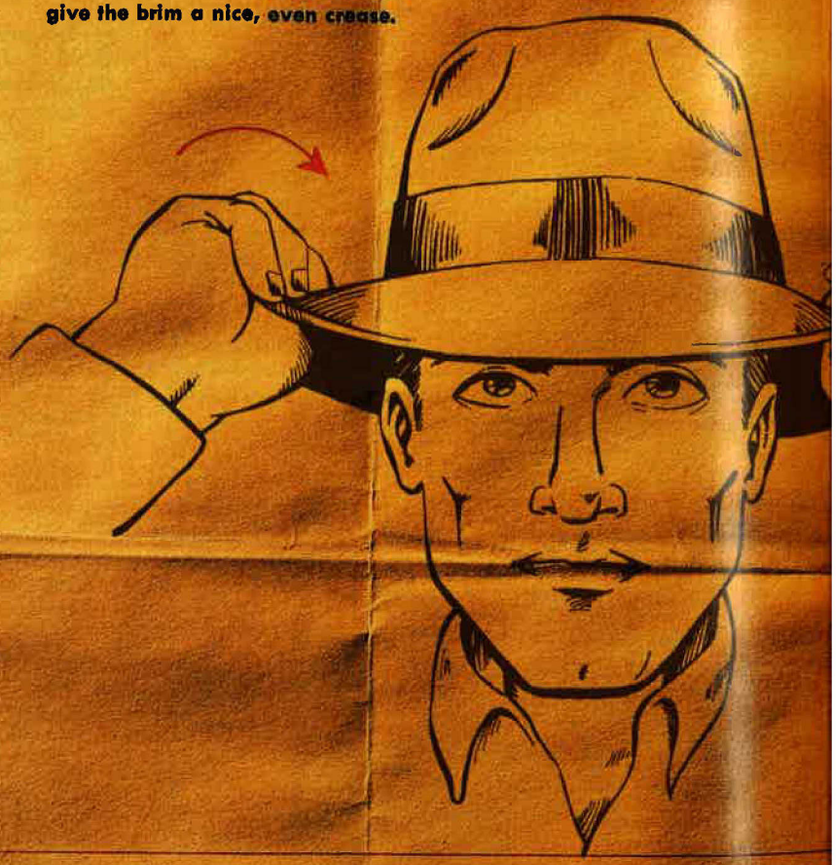
HOW TO BREAK IN A FEDORA:



1 Make sure each side of the crown has a smooth, curved indent.

2 For a look that says you've got places to go and bad guys to hurt, give the brim a nice, even crease.



EXPERT METHODS:

4 Canine chew toy.

5 Mine shaft wind shear.

6 High altitude bridge-hopping.

From the mountains of Kazakhstan to the ruins of the Olmecs. It's 17 chapters.

TEEN T AGES 13+ ESRB

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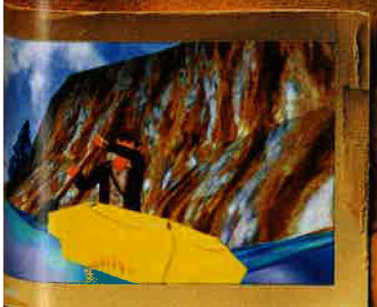
LUCAS Arts

3 Never, under any circumstances, turn the brim up. Remember, you want to look like a stud archaeologist, not some guy named Cletus.

Raging H_2O soaks.



8 Lava vapor treatments.

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(800) 865-2283,
www.gravis.com

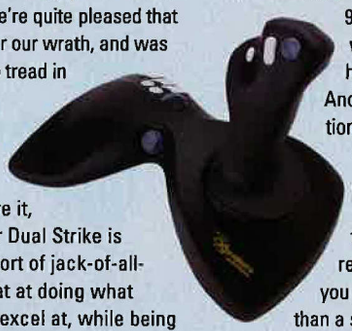
PRICE
$59.95 *(M.S.R.P.)*

OTHER OPTIONS

If you're looking for more of a traditional joystick — or any joystick at all, really — here's a list of several manufacturers you should visit on the web:

Microsoft: *www.microsoft.com/sidewinder*
Logitech: *www.logitech.com*
Saitek: *www.saitek.com*
CH Products: *www.chproducts.com*
Suncom: *www.suncom-inc.com*

It's a bit ironic, really. While we love innovation, we're often forced to lambast controller manufacturers for breaking the mold, or reinventing the wheel if you will, since many times a "fresh, new idea" in controller design ends up being much worse than a standard gamepad, mouse, or in this case, joystick. In this case, though, we're quite pleased that Gravis didn't fear our wrath, and was brave enough to tread in this minefield.



Like the handy-dandy Xterminator Gamepad before it, the Xterminator Dual Strike is intended as a sort of jack-of-all-trades. It's great at doing what other joysticks excel at, while being equally good at doing things you'd never expect a joystick to do at all. If we had to compare this stick to something else on the market, we'd have to say that it's most like Mad Katz's Panther XL, in that it has the equivalent of a built-in mouse device that makes it useful in sims and first-person shooters alike. Though very similar to each other, we now prefer the Gravis stick — its mouse device is easier to come to grips with than the Panther's large trackball.

At its simplest, the Dual Control is a 9-button joystick, complete with a throttle and dual POV hats — an 8-way and a 4-way. And in this most basic configuration, Gravis' stick performs admirably. The stick feels comfortable in the hands, has good tension, and all the buttons are placed in easy-to-reach locations. But it's when you use the Dual control as more than a standard joystick that it really starts to shine. Through Gravis' exceptional programming software, what would otherwise be a 4-way hat can actually become a mouse — functioning not just in games, but in Windows, too! Playing combat sims and first-person shooters like the included full version of *Tribes* is made all the more easy in this configuration, and because of the way the stick's buttons are laid out, veterans should have little difficulty in laying out their control schemes in much the same way as they would on a keyboard.

Our only real complaint here is that the stick didn't seem to want to function under USB, so if you're interested in picking up a Dual Strike, make sure you plug it into your gameport, instead. Oh, and we'll try to keep an open mind from now on.

FINAL VERDICT

HIGHS Extra features are actually beneficial; works great as a standard joystick.

LOWS Still not as good as a mouse and keyboard for first person shooters; wouldn't work in a USB slot.

BOTTOM LINE Regardless of the genre you're into, if you're looking for a new joystick, definitely give the Dual Strike a try. You won't be disappointed.

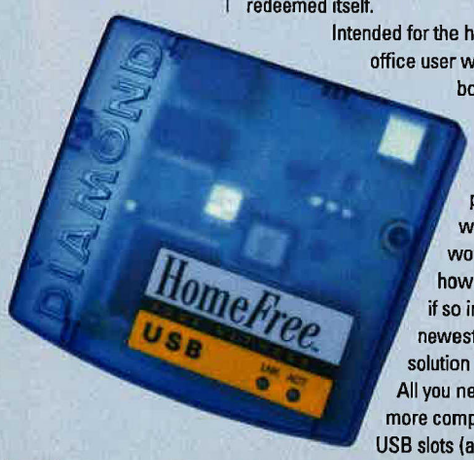
DIAMOND
HomeFree Phoneline USB

PC GAMER EDITORS' CHOICE

COMPANY
Diamond Multimedia,
(800) 468-5846,
www.diamondmm.com

PRICE
$69.99 *(M.S.R.P.)*

We here at the Hard Stuff are often wary of any home networking solution that doesn't involve standard network cards — and for good reason. Many of the alternate solutions we've tried have been less than stellar, *including* Diamond's own HomeFree Wireless kits. With the HomeFree Phoneline USB, however, Diamond has redeemed itself.



Intended for the home or small office user who can't be bothered with configuring network cards and protocols (or who simply wouldn't know how to do so even if so inclined), this newest HomeFree solution is a godsend. All you need is two or more computers with USB slots (as many as 25 can be connected), Windows 98 (you'll probably want to keep a copy of the CD close by during the installation process since it will be required a time or two), the device itself, and a standard phone line connection (all the same phone number), and you're in business.

Diamond's software really does remove the fear of networking by installing all the protocols you'll ever need to share folders, drives, and printers. It even assigns your computer a unique IP address for those pesky TCP/IP network games, and all this is accomplished during the initial software setup. In the past, we've tested "easy to use" home networking kits that showed you how to assign the network device an IP address, but we've never actually seen one that goes ahead and does the job for you. The setup was over and done with so quickly we were left feeling like there should be something more to do. But that's the beauty part; there really isn't!

At 1Mbps, you aren't getting the speeds normally associated with conventional NIC-based network that zip along at either 10Mbps or 100Mbps, but when you consider that most network games are made to run optimally on modems as slow as 28.8kbps, 1Mbps is plenty fast. We tested all sorts of games over our Phoneline network, and they all went off without a hitch.

Diamond's HomeFree solution isn't for everyone, though. There's simply no comparison to all of the extra speed and compatibility one gets with a standard NIC card. Also, many such cards will cost less than a single HomeFree Phoneline unit. But if you're looking for a simple, no fuss solution, Diamond's latest is tough to beat.

FINAL VERDICT

HIGHS Easy to use and simple to setup; automatically assigns separate IP addresses to all connected computers.

LOWS Requires multiple phone jacks all running on the same line (phone number).

BOTTOM LINE Diamond's HomeFree Phoneline USB is one of the best (and easiest) home networking solutions we've seen to date.

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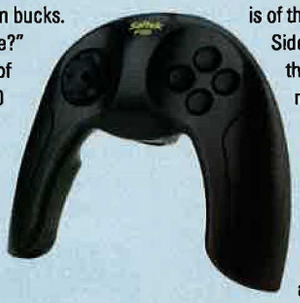
SAITEK
P120 gamepad

PC GAMER EDITORS' CHOICE

COMPANY
Saitek,
(310) 212-5412,
www.saitek.com

PRICE
$9.95 *(M.S.R.P.)*

Will wonders never cease? After playing with Saitek's $50 R100 racing wheel (reviewed below) and being terribly disappointed that the unit didn't ship with any software drivers, imagine our surprise when we first encountered Saitek's P120 gamepad. We figured, "Hell, the damned thing's only ten bucks. How good could it really be?" Don't let the sticker price of this pad fool you; the P120 comes ready to play.



Unlike its wheel-based cousin, the P120 actually manages to ship with driver software — but that's not all. The drivers install two different profiles to your Control Panel; one is digital, and the other analog. That's right, this pad goes both ways, baby! The digital mode is great for action/twitch games, while the analog mode is better suited to racing games and their ilk since precise control is more important than speed. If you're looking for fancy utility software, you should look elsewhere — switching between analog and digital modes requires that you actually replace one driver profile with the other. It's a bit of a pain, but come on! This thing is under 10 bucks!

Like the majority of the gamepads coming down the pike these days, the P120 is of the Batarang/Microsoft SideWinder variety, and even though it's inexpensive, it still manages to be one of the more comfortable controllers on the market. For added comfort and control, the unit even ships with a small thumb-joystick attachment that can be attached to the middle of the 8-way D-pad. If you don't like this option, you can either throw the thing away, or stow it in its own little slot at the bottom of the pad.

We know what you're probably thinking: "Great, it's less than ten bucks, but it's only a four-button controller, right?" Wrong. You can't see them from the picture, but this pad also has two flipper buttons on its underside — one on each side of the pad — very much like a SideWinder.

Everything sounds great so far, right? You're probably looking for the catch. There's really only one, which is that the four primary buttons on the front of the P120 are a bit more difficult to push than we might like. They're not terribly difficult or anything — they just require a bit more force than you're probably used to. When all is said and done, though, at ten bucks — or even thirty — there's a heck-of-a-lot to love about this gamepad.

FINAL VERDICT

HIGHS Comfortable; very inexpensive; choice of either analog or digital; comes with driver software.

LOWS Buttons could be easier to depress; switching between analog and digital is a bit of a pain.

BOTTOM LINE There's got to be some mistake. The P120 is simply too good to be only $9.99!

OTHER OPTIONS

In the ten-dollar price range, the P120 really doesn't have any competition. If you're interested in programming a lot of special moves into your gamepad, however, pads like Microsoft's SideWinder Gamepad (*www.microsoft.com/sidewinder*) and Logitech's WingMan Extreme Gamepad (*www.logitech.com*) will cost a bit more, but are well worth the extra green.

SAITEK
R100 Racing Wheel

COMPANY
Saitek,
(310) 212-5412,
www.saitek.com

PRICE
$49.99 *(M.S.R.P.)*

Around this time last year, racing wheels were all the rage. Well, let's be a bit more precise — racing wheel manufacturers *believed* them to be all the rage and therefore released new models on what seemed like a weekly basis. Looking back, force feedback seems to have been the driving force (pardon the pun) behind the popularity. But now it seems the novelty has worn off; we certainly don't see any manufacturers stepping forward to release a "second generation" force feedback wheel. In fact, in the past several months (prior to the R100), we received no wheels at all. So now that the "era" of fancy, often-overpriced wheels has come and gone, we're entering a time where low-end, reasonably priced wheels can mop up. Enter Saitek.

Saitek has a history of licensing Microsoft's controller technology, so it's not surprising that its latest wheel looks very similar to Microsoft's design. This is actually a good thing, because despite its incredibly small size, the wheel retains many of the positive features of the Microsoft force feedback wheel (minus the force feedback, of course). Most importantly, it's very comfortable to use, even during prolonged gaming sessions. What surprised us most is that, for a wheel with such a low price, it comes with a decent set of pedals. They're small to be sure, but they get the job done.

Unfortunately, Saitek does manage to fudge things up in a couple of key areas. For starters, it didn't see fit to create any software drivers for the wheel, so you're forced to go and set this beauty up yourself (following the instructions in the whopping two-page manual, of course) in your Windows Control Panel. It ain't brain surgery, but it's not something we enjoy doing, either. Also, even though the R100 looks to have proportional rudders on either side of it, the reality is that they are the plain ol' "on" or "off" sort, just like the other two buttons on the wheel's face, rendering them useless as an analog throttle and brake system for those that don't like bothering with pedals.

For the price, the R100 is a good value if you're on a seriously tight budget. But when you consider that you can purchase the wonderful and attractive Act Labs RS for $69, saving up for another week or two probably isn't such a bad idea.

FINAL VERDICT

HIGHS Very comfortable to hold; great low price; good basic design.

LOWS Lacks driver software; lacks proper proportional rudders so you can't use them for braking or an analog throttle.

BOTTOM LINE Go for the R100 system if you're a die-hard racing fan on a strict budget — but only after you understand its limitations.

OTHER OPTIONS

As mentioned in the review, Act Labs makes one of the best non-force feedback wheels around — head on over to *www.act-lab.com* and take a look at the RS wheel has to offer.

RTK-ITC-1318-00027021

Realtek Ex. 1014
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RX-1672.00012

AUREAL

SQ 1500 and 2500

PC GAMER EDITORS' CHOICE

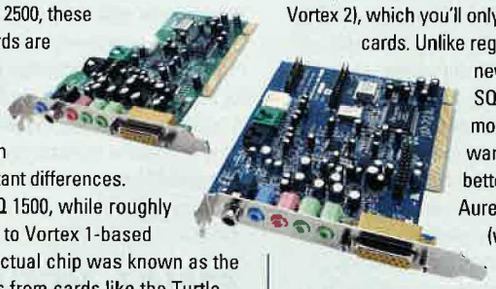
COMPANY
Aureal,
(888) 345-7633,
www.aureal.com

PRICE
$69 and $99, respectively
(M.S.R.P.)

OTHER OPTIONS

Looking for another cool line of sound cards so you can compare features? If so, check out Creative Labs' Sound Blaster Live! cards at *www.soundblaster.com*. Or, just look at our review of the two newest Live! cards below!

In an interesting twist of fate, Aureal has begun selling its own line of sound cards instead of relying on companies like Diamond and Turtle Beach to evangelize its technology for it. Coming in two different flavors, the SQ 1500 and SQ 2500, these two new cards are very similar to their O.E.M. brothers with a few important differences.



The SQ 1500, while roughly comparable to Vortex 1-based cards (the actual chip was known as the 8820), differs from cards like the Turtle Beach Montego A3D in that it uses a slightly different, less powerful, 8810 processor. Because of this, a lot of the A3D 1.0, DirectSound, and DirectSound3D effects it accelerates are mostly done in software (i.e. by your CPU). Other than that, though, the SQ 1500 actually offers a couple of very nice features never before seen in a Vortex 1 card, such as a digital S/PDIF out for connecting to a digital receiver or digital speakers, and the ability to drive two or four speakers for surround sound setups.

The SQ 2500 on the other hand, uses an improved version of the 8830 chip (a.k.a. Vortex 2), which you'll only find with Aureal cards. Unlike regular 8830s, this new one allows the SQ 2500 to do even more work in hardware — including better, more precise Aureal Wavetracing (which examines the geometry of a virtual world and tracks reflections and occlusions as sounds travel through space). Like the SQ 1500, this card also comes equipped with a digital out. Unlike the SQ 1500, the 2500 can accelerate A3D 1.0 and 2.0, as well as DirectSound and DirectSound 3D.

Though we tend to prefer the Creative Labs Sound Blaster Live! line of cards, there's still a great deal to like about Aureal's offerings. It comes down to a matter of taste, really. While A3D is all about creating realistic room and environment effects, EAX (the surround sound standard employed by SBLive! Cards) is much more about letting the game designers themselves create the soundstage they want for the environments in their games. As a result, many EAX-based games have a much wetter (more reverb) sound and tend to be more dramatic in their effects. Which card should you go for? SBLive! or Aureal? Look at the games you like and see which API (EAX or A3D) is more heavily supported and choose accordingly.

FINAL VERDICT

HIGHS It's nice to have the creators of the core technology making their own cards; digital outs; four-speaker support.

LOWS There's not much new here if you've already got a card like the Turtle Beach Quadzilla.

BOTTOM LINE If you're looking for an A3D sound card, these are the two you're going to want to check out.

SOUNDBLASTER

Live! MP3+ and X-Gamer

PC GAMER EDITORS' CHOICE

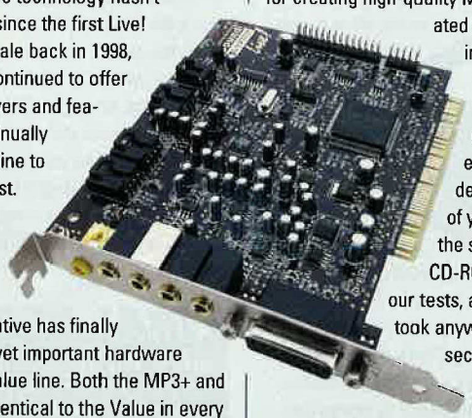
COMPANY
Creative Labs,
(800) 998-1000,
www.soundblaster.com

PRICE
$99 *(M.S.R.P.)*

OTHER OPTIONS

Looking for another cool line of sound cards so you can compare features? If so, check out Aureal's cards at *www.aureal.com*. Or, just look at our review of the two newest Aureal cards above!

Can Creative Labs do no wrong? Well, yeah, they can, but they've yet to do so with their excellent line of Sound Blaster Live! sound cards. Though the core technology hasn't changed a bit since the first Live! card went on sale back in 1998, Creative has continued to offer ever better drivers and features that continually push the Live! line to the top of the list.



With the release of the SBLive! MP3+ and X-Gamer packages, Creative has finally made a small, yet important hardware update to its Value line. Both the MP3+ and X-Gamer are identical to the Value in every way but one — each comes with digital out connections. This fact might not seem important to you at first glance (especially if you're using analog speakers), but when you hear the difference that digital makes when running on a nice set of digital speakers, you'll be singing a different tune.

The only difference between these two "kits" is their software bundle. As its name implies, the MP3+ includes software for creating high-quality MP3 files. We created many such files in a snap with this handy software. The speed of encoding is entirely dependent on the power of your system and the speed of your CD-ROM recorder. In our tests, a 34MB song file took anywhere from 45 seconds to several minutes depending on the PC. As an added benefit, Creative's Digital Audio Center can also convert MP3 files to WAV files. This is great news because once in WAV form, tracks can be burned onto a CD and played on standard CD players.

The X-Gamer comes with a "light" version of Creative's Digital Audio Center that isn't nearly as robust, and only creates relatively low-quality MP3 files. But that's not the reason you're buying this version of the card, anyway — you want the games it comes with: full versions of *Descent 3*, *Need for Speed 4*, *Thief*, and demo versions of *Myth 2* and *Aliens vs. Predator*. Other than the software mentioned, both cards come with a huge suite of additional programs ranging from speech recognition software to SoftKaraoke. Either way you go, we're quite sure that you'll be very happy with your purchase.

FINAL VERDICT

HIGHS SBLive! Value with a digital out; accelerates DirectSound, DirectSound 3D, A3D 1.0 and EAX 1.0 and 2.0; comes with great software bundles.

LOWS S/PDIF-out requires mini-stereo to RCA cable to attach to most digital speakers.

BOTTOM LINE Both of the new SBLive!s are fantastic, and both receive our highest recommendations.

RTK-ITC-1318-00027022

Realtek Ex. 1014
Case No. IPR2023-00688

RX-1672.00013

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GAMING MACHINES

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"Performance was simply stunning" -Computer Gaming World

GREY
Intel Pentium Celeron 500MHz Processor
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Free installation & configuration of favorite games & optimal drivers

Price: $999.00

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Financing starting at: $24.00/Mo.,60 Mos

HIVE-MIND
AMD Athlon 700MHz Processor w/3DNOW!
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56X CD-ROM Player
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Microsoft Intellimouse PS/2
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Microsoft Sidewinder Precision Pro
Microsoft Windows '98 SE OS
Free installation & configuration of favorite games & optimal drivers

Price: $2,399.00

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Financing starting at: $65.00/Mo.,60 Mos

AREA 51
AMD Athlon 750MHz Processor
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AMD 751 Irongate Motherboard w/5 PCI Slots
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Pioneer 10X/40X DVD Player
HP 9100i CDR-W CD-Writer 8/4/32X
ATX Full-Tower Case w/300 Watt PS
Microsoft Internet Keyboard PS/2
Microsoft Intellimouse PS/2
US Robotics V.90 56K Voice/Fax/Modem
Microsoft Sidewinder Precision Pro
Microsoft Windows '98 SE OS
Free installation & configuration of favorite games & optimal drivers

Price: $3,499.00

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Financing starting at: $85.00/Mo.,60 Mos

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HSTRINITY

Everybody wants a fast gaming computer, but what are you supposed to do if money is tight — or, on the flip side, if you've got money to burn? Are you supposed to go to your local computer super store and buy, of all things, a retail machine? Heck no! Each month the Trinity Page will list the parts we recommend for low, mid, and high-end budgets. Most of the prices printed here are from various Internet resellers, and at press time, are the best deals around. Depending on when and where you shop, you may find these items for a bit more, or, if you're lucky, a bit less.

WELCOME TO A BRAVE NEW WORLD

ENTRY-LEVEL SYSTEM

PRICE: ROUGHLY $999

CASE: Addtronics 6890A	$100
PROCESSOR: Intel Celeron 500MHz PPGA	$128
MOTHERBOARD: A-Bit BE6	$108
MEMORY: 64MB PC-100 SDRAM	$62
PPGA (SOCKET 370) CONVERTER: AB-RS370	$15
CD-ROM/DVD-ROM: Hi-Val 6X Pioneer DVD-ROM drive w/software DVD decoding	$115
FLOPPY DRIVE: Samsung 3.5" 1.44MB	$8
HARD DRIVE: 6.4GB Seagate ST36421A	$86
SOUND CARD: Creative SBLive! Value	$43
MODEM: Diamond SupraMax 56k PCI	$18
MONITOR: 17" Optiquest Q71	$175
VIDEO CARD: 3dfx Voodoo3 3000	$107
JOYSTICK: Logitech WingMan Digital	$17
GAMEPAD: The original Microsoft Sidewinder Gamepad	$23
SPEAKERS: Labtech LCS-2414	$35
KEYBOARD: Addtronics	$15
USB MOUSE: Logitech or Microsoft	$39
TOTAL:	$1,094

MID-RANGE SYSTEM

PRICE: ROUGHLY $1,800

CASE: Addtronics 6890A	$100
PROCESSOR: Intel Pentium III 600MHz or AMD Athlon 600MHz	$422 $393
MOTHERBOARD: For PIII: A-Bit BE6 For Athlon: FIC SD-11	$108 $133
MEMORY: 128MB PC-100 SDRAM	$138
CD-ROM/DVD-ROM: Creative Encore 6x with Dxr3	$141
FLOPPY DRIVE: Samsung 3.5" 1.44MB	$8
HARD DRIVE: 13.5GB IBM Deskstar 7200rpm Ultra 66 EIDE	$130
SOUND CARD: CL SBLive! MP3+	$73
MODEM: Diamond SupraMax 56k PCI	$18
MONITOR: 19" Optiquest V95	$338
VIDEO CARD: Creative Labs 3D Blaster TNT2 Ultra	$148
JOYSTICK: Microsoft Sidewinder Precision Pro	$53
GAMEPAD: The original Microsoft Sidewinder Gamepad	$23
SPEAKERS: Cambridge SoundWorks FPS 1000	$70
KEYBOARD: Addtronics	$15
USB MOUSE: Logitech or Microsoft USB	$39
TOTALS: Intel PIII-based:	$1,824
AMD Athlon-based:	$1,820

HIGH-END SYSTEM

PRICE: ROUGHLY $3,000 AND UP

CASE: Addtronics 6890A	$100
PROCESSOR: Intel Pentium III 733MHz or AMD Athlon 700MHz	$799 $653
MOTHERBOARD: i820 based For Athlon: FIC SD-11	$125 $133
MEMORY: 128MB PC-100 SDRAM	$133
CD-ROM/DVD-ROM: Pioneer HDVD10AS-0001 10X DVD-ROM with MPG2 card	$259
FLOPPY DRIVE: Samsung 3.5" 1.44MB	$8
HARD DRIVE: 22GXP IBM Deskstar 7200rpm Ultra 66 EIDE	$222
SOUND CARD: CL SBLive! MP3+	$73
MODEM: 3COM 3CP5610 56K v.90	$85
MONITOR: 19" Optiquest V95	$338
VIDEO CARD: NVIDIA GeForce 256-based card: Creative Labs Annihilator	$208
ADD-ON 3D: 12MB 3dfx Voodoo2	$70
JOYSTICK: Saitek X36 Flight Control System	$96
GAMEPAD: The original Microsoft Sidewinder Gamepad	$23
SPEAKERS: Klipsch ProMedia v.2-400	$249
KEYBOARD: Microsoft Natural Pro	$75
USB MOUSE: Original IntelliMouse with IntelliEye technology	$55
TOTALS: Intel PIII-based:	$2,843
AMD Athlon-based:	$2,780

RTK-ITC-1318-00027025

Realtek Ex. 1014
Case No. IPR2023-00688
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RX-1672.00016

Just when you thought it was safe to install a new mouse...

Dear Greg, nearly gone and totally forgotten, is still alive! As reported last month, one Dear Greg question will appear each month HS Tech Q&A is two pages or longer, so keep those Dear Greg questions coming! Oh, and go ahead and send regular questions, too.

New Jaz drives are faster and hold 2GB instead of one.

Q I have a question concerning Iomega's Ditto and Jaz drives. Can I run programs from them like I would a normal hard drive?

—STEVE, VIA THE INTERNET

A If you connect a Jaz drive to your PC using a SCSI adapter, you could run programs directly from it since it's actually a bit faster than some older hard drives. The PCI SCSI card will give the best performance, and it's the optimal choice. The ISA SCSI card should still work in a pinch, too. Whatever you do, though, don't use the parallel port adapter. It's much too slow to be used for anything other than data retrieval. As for the Ditto drive, it's strictly for back-ups and is too slow to run programs directly.

NEED HELP?

If you have a hardware question or comment, or a personal problem, write to:

Greg Vederman,
Hard Stuff, PC Gamer,
150 North Hill Drive,
Brisbane, CA 94005

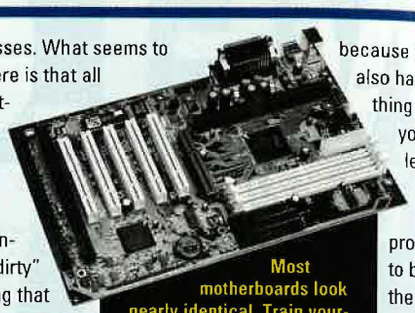
or E-mail:
gvederman@pcgamer.com

Q My computer frequently locks up and crashes excessively in all of the following ways: blue screen of death, random restarting of computer, frozen image with looping sound, frozen image without sound, frozen image with mouse cursor still able to move, Windows error in combo with one of the last two scenarios, etc. There are also a few other things you should be aware of: My room has no ground wire, I live in a rural area, and there are three computers running in this one room alone. None of the other computers seem to have any problems except for when their motherboards burn out every couple of years. Any ideas on what's happening here?

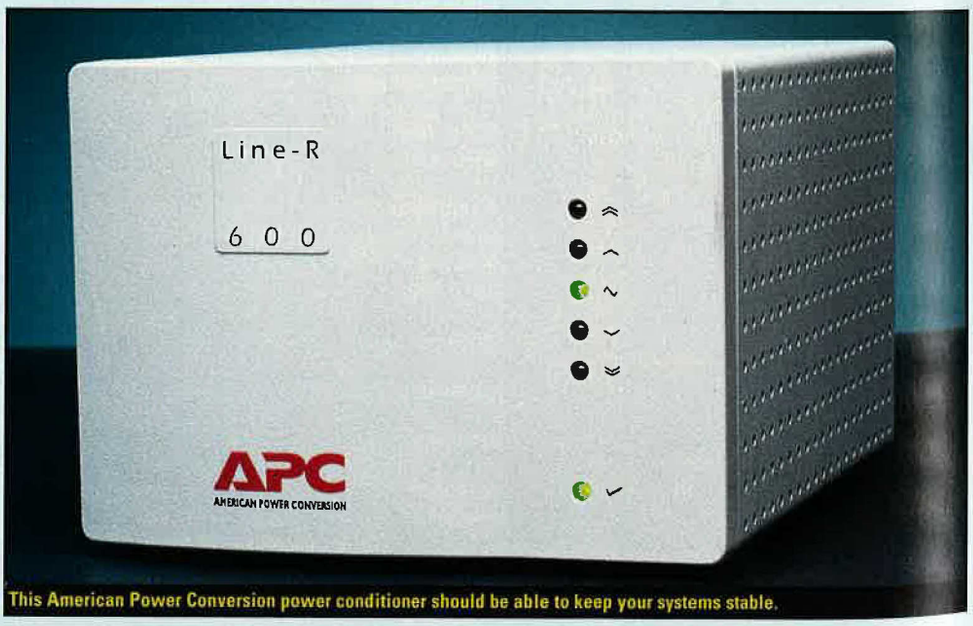
—BILLY, VIA THE INTERNET

A This is a joke, right? Well, even if it is, it serves as a good example for the masses. What seems to be going on here is that all of your computers — not just the one you're asking about specifically — are running on very "dirty" power, meaning that you're either getting too much power or too little power to keep things copacetic. I'm thinking that a line conditioner could probably help you greatly. Head over to *www.tripplite.com* for starters, and then try *www.apc.com* (American Power Conversion) and compare prices and specs of their respective products. My guess is that you'll no longer be frying motherboards on a regular basis in your other two computers.

As for your primary computer, it might be too late. Try formatting your drive and reinstalling Windows once you've got your new conditioner plugged in and running and see if your problems disappear. Also, make certain that your computers are getting enough cooling, because that could also have something to do with your problems — although you'd probably have to be living on the sun to have as many burn-outs as you've had....


Most motherboards look nearly identical. Train yourself to look for things like the number of PCI and RAM slots.

Q I was truly inspired by your feature on how to build a PC. After reading it, I began to look around on the Internet for the necessary parts. As you might expect, I started with the motherboard. A short while after I began my search, it became readily apparent that there was too much information out there for me to absorb on my own; every motherboard company out there seems to make at least a dozen different boards! How in the world am I supposed to tell them apart from one another? What should I be looking for? What should I avoid? Please



This American Power Conversion power conditioner should be able to keep your systems stable.

RTK-ITC-1318-00027026

Realtek Ex. 1014
Case No. IPR2023-00688

RX-1672.00017

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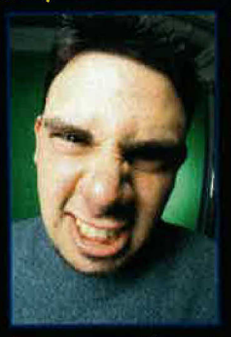
DEAR GREG

Q First off, I'd like to say that I'm quite impressed with the things you do in The Hard Stuff. I think it's wonderful how people can write to you to share their emotions and ask for your comments and support. It's a great way to help out the wonderful people who read your magazine. We need more Gregs in this world!

Um, anyway, I am in the process of building a new computer and I had a couple of questions. First off, I was wondering where you found all the components for the computer you built in the December 99 issue. You found the A-Bit BE6 for $106? I found it for $130 — what gives? If you could tell me where you found it, the PIII, and the RAM so cheap, I would greatly appreciate it. Second, I am wondering if I will need to buy a new case for my computer when I upgrade. My existing case is from an old Pentium 120MHz and doesn't support USB. If I do need a new case, where can I find one?

—BRIAN, VIA THE INTERNET



A Listen here, you pathetic suck-up. Did you really expect your sarcasm not to show through in your writing? Did you expect me to act just like a girl who doesn't get enough praise from her boyfriend who then sheds a tear of joy when he finally throws some compliments her way? I've got news for you; I'm not that type of girl! I'm the sort of girl who (wait, something's wrong here)...Oh, never mind. You get the idea. Just watch yourself in the future, bub.

As for where I found the components for the "Pennies on the Dollar" feature, most of them were from Internet companies we found using *pricewatch.com*, though a few of them were from other companies outside of Pricewatch's service. The prices I list on the Trinity Page should not be used as a set-in-stone price guide, but rather a way to see if you're getting a good deal or not. Generally speaking, the prices listed are the cheapest around, so chances are that the average person is going to end up spending more — especially if they shop in a retail store instead of online. In your case, the parts and prices were indeed found on *pricewatch.com* and unless something major happens in the industry between when I got the prices and the time you're reading these words, everything should be just about the same as they are on the Trinity Page.

help me solve this mother (board) of a problem.

—MIKE, VIA THE INTERNET

A I feel your pain, Mike. Simply put, there are *tons* of different motherboards out there to choose from — so many in fact that it's almost too daunting a task to pick one in the absence of guidance from someone in the know.

What are some of the specific things you should look out for? That's a tough one given the limited space I have here. If you want to use an Intel CPU, your best bet is a motherboard that uses either the 440BX chipset or i820 chipset. The 440BX is the older of the two, has a 100MHz front side bus (the road your system memory takes to talk to your CPU), and AGP 2X, while the i820 offers many improvements, including AGP 4X, a 133MHz front side bus, and a lack of ISA slots. Either chipset should work great depending on the other hardware you opt to put in your new computer. As for brands, I've always liked Asus and A-bit, but there are many other great companies out there, too. Ultimately, if you're worried, go for the motherboards we recommend on the Trinity Page, and you should be fine.

The Voodoo4 4500 (pictured above) and Voodoo5 5000 will both come in a PCI flavor.

Q Back in January, I picked up an IBM Aptiva. It works fine, but the ATI Rage Pro that it came with is imbedded in the motherboard. Because of this, I recently went out and got a 3dfx Voodoo3 2000 PCI to run newer games. It works fine, but I question whether or not the video card companies are going to keep putting out fast 3D cards in a PCI format. Are they?

—NAME WITHHELD, VIA THE INTERNET

A I recently spoke to 3dfx about this very subject. To hear them tell it, 3dfx is really the only company left out there that has any plans to continue to support PCI. Other companies either don't see it as being viable any longer, or would have to spend too much money getting their made-for-AGP graphics processors working properly on PCI given the different power issues. That said, even 3dfx doesn't plan on releasing its most powerful new accelerators in a PCI format. Because of this, you might want to think about buying a new case and motherboard down the road so you can take advantage of all the future has to offer.

Q I know there are ways of getting better performance out of a standard modem, but is there any way that I could improve the performance of my cable modem?

—ANGELA KELLER, VIA THE INTERNET

A I actually have a cable modem myself, and have tried a number of utilities out there that claim to do just that. Unfortunately, I've yet to come across any that really improved things for me. Cable modems are a lot more like routers than modems, and as such, you're much more likely to screw things up or lose your connection altogether before you ever actually speed things up. Ultimately, cable modem use in your area is the key determinant in your overall performance, and unless you can get your neighbors to stop using their modems, your speed is going to be at the mercy of their ferocious porn surfing antics.

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