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What's new in 3ds max 5?



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Storage Solutions MEGA Test

7 DVD-ROMs, 11 CD-Writers, 8 Hard Disks, 11 External Devices

Inside the SIMPUTER



Busting the









Reviewed: Athlon XP 2600+ Games that never were Updating your videocard driver



Apples and Oranges

t just works. That's the bottom line behind the success of the Macs. Simplicity and ease of use coupled with flawless integration of hardware and software are precisely the reasons why Macs are positioned to become the *de facto* platform for home digital entertainment.

That's right, when it comes to playing and creating movies, viewing your digital photo collection or listening to MP3 music, there's very little a Mac cannot do straight out of the box. Now think of a PC and you're sure to recollect one harrowing experience after another.

Okay so we're desensitised to driver problems, weird blue screen crashes and system lockups, or trying to figure out how to use a particular feature in that fancy multimedia application. But these 'oversights' are what make most people techphobic in the first place. All PC users can't be expected to invest hours of their time into exploring and working around these glitches. Most of them simply throw their hands up in the air and exclaim, "Bah, this is not worth the effort!"

This is where Apple steps in. In fact their marketing campaign recites similar experiences of frustrated PC users turned Mac converts. And they boast simplicity and a cutting-edge digital entertainment experience as the topmost reasons for shifting to a Mac.

But we all know that Microsoft hates being an innocent bystander. If anything, their business philosophy can be summed up as, "If our customer is hooked onto something we don't make, we start making it!"

Enter Windows XP Media Center Edition. Some might know it as 'Freestyle', but for the uninitiated, this new Microsoft Operating System defines the state of things to come. Not only is Microsoft building a brand new user interface that works seamlessly with a remote control for all digital entertainment needs, they are also collaborating with hardware vendors in laying down the specifications of the PCs that will drive this new OS.

Try connecting the dots. A new Microsoft OS based upon the Windows XP kernel to specifically handle digital entertainment tasks, to turn a PC into a full-fledged home entertainment device where watching TV, DVDs, playing music or browsing your digital photo collection is possible at the flick of a remote control button. And it will come preloaded on a state-of-the-art system that's built under Microsoft's supervision.

The writing's on the wall—Microsoft is all set to hit Apple where it hurts the most. And all Apple can do is to get back to the drawing board...once again.

Vinil grad

vinit_aggarwal@jasubhai.com



Vinit Aggarwal
Assistant Editor

Apple boasts of simplicity and a cutting-edge digital entertainment experience as the topmost reasons for why you should shift to a Mac **

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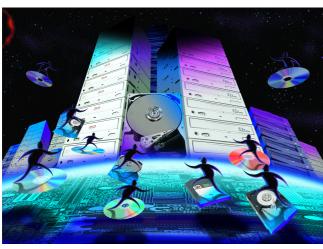
Can 3ds max 5 make a splash in the 3D modelling pool?



\$ 96 Keep a lookout for otential data disasters



Let us point you to the right recreation areas online

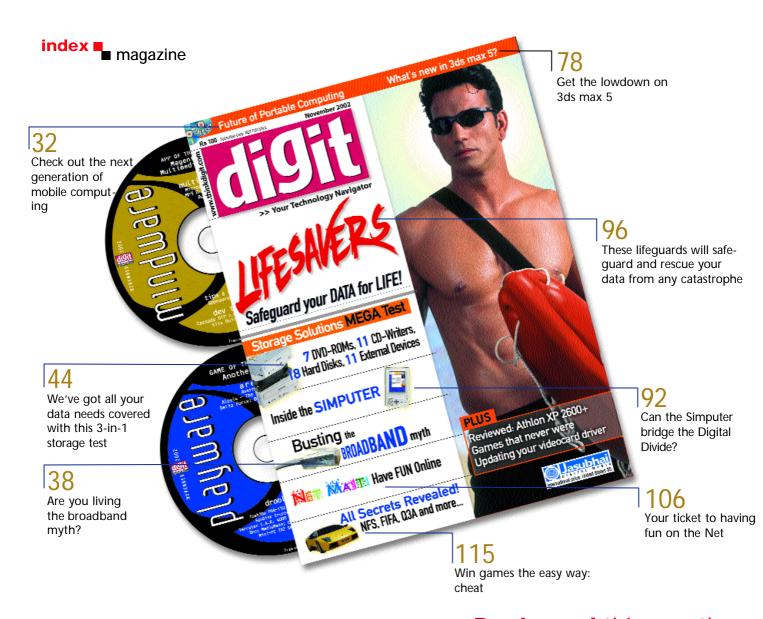


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	S .	

ON THE CD



HIGHLIGHTS

AstroMart 7.0

Size: 5.85 MB, Type: Trial Mindware\Software\Home

Backup Genie 1.5

Size: 615 KB, Type: Freeware Mindware\Software\System

Code-Genie 3.0

Size: 0.6 MB, Type: Freeware Mindware\Software\Developer Tools

Delta Force : Black Hawk Down

Size: 47 MB, Type: Demo Playware\Arena\Games

Helium2 Advanced Edition 1.2

Size: 6.8 MB, Type: Trial Mindware\Software\Multimedia

Home Inventory 1.0

Size: 4 MB, Type: Trial Mindware\Software\Home

Kaboom! Cola

Size: 1.2 MB, Type: Demo Playware\Arena\FunZone

mIRC 6.03

Size: 1.2 MB, Type: Trial Mindware\Software\Internet

Microangelo 5.54

Size: 2.4 MB, Type: Trial Mindware\Software\Multimedia

NeoNapster 3

Size: 0.9 MB, Type: Freeware Mindware\Software\Internet

Ricochet 1.3

Size: 7 MB, Type: Trial Playware\Arena\FunZone

Tiny Personal Firewall 2.0.15

Size: 1.35 MB, Type: Freeware Mindware\Software\Internet

Windows XP Service Pack 1

Size: 135 MB, Type: Freeware Mindware\Software\Internet

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MINDWARE\RESOLVE

The *Resolve* section on your Digit CD brings you answers to frequently asked questions on the latest technologies,



whitepapers for those who yearn to know the grinding details of each technology and tips and tricks to use

 $technology\ better.$

This month we bring you FAQs on the various facets of Storage Solutions and whitepapers on hard disk technologies, giving you a complete picture on everything you need to know about storage media. The tips and tricks help you to use your PC at home to make those routine tasks simpler.

MUST-TRY SOFTWARE

Magenta II Multimedia Tools

Magenta II is a professional authoring tool for developers of front-end applica-

tions, courseware and multimedia. It is capable of producing highquality, reliable applications for



Windows operating systems. Its major features include code-generating wizards, event-driven programming, ready-to-use components and Internet support for HTTP, FTP, SMTP and sockets.

Size: 10.1 MB, Type: Trial Mindware\Software\Multimedia

PGPi 7.0.3

It's personal. It's private. And it's no one's business but yours. You may be planning a political campaign, discussing your taxes, or having an illicit affair. Whatever it is, you don't want your private e-mail



or confidential documents read by anyone else. More and more of our private communications are being

routed through electronic channels. E-mail is gradually replacing paper. E-mail messages are just too easy to intercept and scan for interesting keywords. This can be done easily, routinely, automatically and undetectably on a grand scale. PGP empowers people to take their privacy into their own hands. PGPi is the international version of the most widely-used and free public key encryption tool. Size: 7.4 MB, Type: Freeware

Another War

Mindware\Software\Home

Another War takes place during World War II in Nazi-occupied Europe. It is a colourful

story of an adventurer who wants to save his friend from the Nazis. The plot starts in a small town in occu-



pied France and goes on to Leningrad where he stumbles upon one of the most secretly guarded projects run by both, Soviet and German engineers.

Size: 232 MB, Type: Demo Playware\Arena\Games

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WEB SPECIAL



Make your PC an Earning Member

Ten feasible ideas to make your home computer pay for itself!

SFARCH

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BY DEMAND



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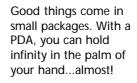
WordPerfect Office 2002 (170 MB) for Mindware

No One Lives Forever 2

(158 MB) for Playware Expect these on the December 2002 CDs.

WFR SPF

Small Wonder





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NOVEMBER 2002

hypethesis

Blue Laser Discs

- What are they?
 These are optical disks invented by Philips where up to
 1 GB of information can be stored on a disk measuring just 3 cm in diameter—nearly twice the amount that can be stored on conventional 8 cm CDs that hold 700 MB of data. The disk also has special drives being developed for it, to be used in portable devices like digital cameras, MP3 players, handheld devices and even cell phones.
- How does it work? The disks are fabricated using blue lasers instead of the conventional red lasers. Having smaller wavelengths, the lasers can read data packed in a denser format. Correspondingly, the pit size and track spacing is also lower than conventional CDs and even DVDs. The prototype drive to read these disks measures just 2.2x1.3x0.3 inches. Standard sized CDs using this technologies feature capacities of up to 27 GB.
- What does it mean to me?
 Optical disks are far cheaper than other forms of digital storage and given their size, they are ideally suited to mobile applications in place of technology like Flash memory, which is costlier.
 These types of storage media are also far more robust as compared to other solid-state memory implementations.

Copying media for personal use legal?

In reponse to Hollywood's aggressive anti-piracy issues, a bill has been presented in Washington to protect the rights of consumers to make



copies of digital music, movies and books. Called the Digital Choice and Freedom Act, the bill will "help retard the growth of efforts to roll over consumers' rights," said representative Zoe Lofgren. The state Assembly Committee on Arts, Entertainment, Sports, Tourism and Internet Media will host an all-day hearing investigating the impact of Internet music piracy on California's recording industry. The bills could balance the political debate that so far has favoured the entertainment industry.

The bill would amend federal copyright laws to extend consumers' fair use rights to copyright-protected entertainment that comes in digital form.

Google launches news service

Google has beefed up its Web site using its search engine technology to add ground-breaking news services. Google News scans 4000 news sources in real time, creating a dynamic page displaying top news.

The front page offers brief headlines and a synopsis of the stories with photographs. When you click on a headline, you are taken to the source's Web site to read the full story. If you choose a related link, a list of stories on the same subject from competing news outlets is displayed, allowing you to take your pick. "People can now pick a story and then decide the source, instead of picking a source and finding a story,' says Marissa Mayer, Google. com product manager.

The service is completely automated and relies on the same information-ranking technology used in the Google search engine to deliver relevant results.

What's in a name?

The Free Software Foundation (FSF), headed by open source evangelist Richard Stallman, has called for Linus Torvald's operating system to be renamed GNU/Linux.

Linux has rapidly become a well-known operating system, and Stallman argues that GNU's role in its development is not getting enough recognition. His document states his point saying, "This system is basically a version of the GNU system, modified to use the Linux

kernel. We started developing

the system in 1984, years before Linus Torvalds got involved, and we also wrote the largest part of the code. In fair-

ness, we
ought to get
equal mention."
The FSF's
demands have
split the open
source community. Some

have suggested that the organisation is just being petty, while others back its argument but think that the FSF is fighting an uphill battle, as all GNU/Linux-based systems will simply be shortened to 'Linux'.

snapshot

Digital video recorders to reach 1.8 million by end of 2003 and 19.1 million

Source: The Yankee Group

by 2006

■ HP to bundle CD, DVD Writers on Pavilion desktops and notebooks ■ Intel launches 11 mobile CPUs up to 2.2 GHz and ups Celeron to 2 GHz

Hard drive warranties lowered

Three of the mag-drive makers have cut Three of the major hard down the length of warranties from three years to one year on some of their drives, starting October 1 2002. PC makers have been pulling

back the warranties on their computers in an effort to reduce costs, hard-drive makers Seagate, Maxtor and Western Digital are following suit. These three giants comprise 85 per cent of the hard drive market.

The changes will only be for drives sold for desktop PCs and some consumer-electronics products, which traditionally have one-year warranties or less, according

to representatives from all three companies. We're following the trend in desktop PCs, where they've all switched to one-year warranties," said Stephen DiFranco, vice president of marketing at Maxtor.

"This should have no effect on consumers because we hardly ever get returns in the second or third year and it frees up cash that we have to reserve to cover the warranties.

The companies maintain three and five-year warranties for drives used in large businesses such as banks. Western Digital will offer extended warranties directly to customers, while Maxtor and Seagate expect retailers to have extended

warranty programs.

FBI names top

security flaws

With an eye on taking the ease out of hacking, the FBI and SysAdmin, Audit, Networking and Security (SANS) Institute have announced two Top Twenty Internet Security Vulnerabilities for 2002. This list outlines the software features most often used by hackers to circumvent computer security and break into Windows and Unix systems.

As part of the announcement, federal agencies have been urged to test their networks for systems with any of the listed risks.

The SANS Institute was also planning a weekly critical vulnerability analysis mailing list. This will rely on a committee of 15 security professionals to decide which of the dozens of vulnerabilities found each week should receive special attention. In addition, it intends to develop a broader list of potential security problems to give companies further guidance on the security of their networks.

redalert

Bugbear

Infections by the new Bugbear worm (also known as Tanatos) have rocketed overnight. In just the first day of the worm being released, there were over 22,000 new infections. Asia and the Far Fast have been the worst hit areas, with the US a close second. The worm copies itself into the Windows system directory and startup folder as an EXE file with a random three-letter name. Once installed, it disables anti-virus and firewall software and installs a Trojan keystroke logger as a DLL, detected as PWS-Hooker.dll. The worm also seeks to infect all other PCs on the network via the address book and network shares. All major antivirus companies have provided updates for their software to remove the virus.

Opasoft

Another worm that targets Windows 95, 98 and Me is called Opasoft, W32/Opasoft, or Opaserv. Unlike other worms that spread over the Internet through infected e-mail, Opasoft uses the NET-BIOS protocol. Once it hits a machine, it scans the network for other machines to attack. When a vulnerable machine is located, it checks if the C drive can be accessed, places a copy of itself on that machine and then alters the win.ini file so that the worm is run the next time the machine is started. Although the damage it does is not known, it opens a back door to www.opasoft.com, from which updated versions of the worm and other script files are downloaded. Anti-virus updates should be able to take care of the virus.

Need more space?

anyo Electric has introduced a drive which can

read and write twice the amount of data onto conven-CD-Rs. tional

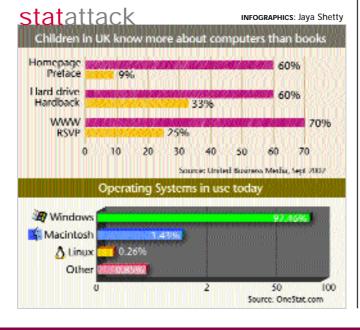
to 2 hours of video!

When data is recorded with the new CRD-BPDV2 drive, a meagre 700 MB CD-R can hold 1.4 GB of data, thats up

Sanyo's HD-Burn technology increases the data

> storage density by increasing the number usable pits into which data is

burnt. The company plans to start mass production in January next year, aiming at manufacturing 30,000 units a month.



■ Microsoft recruits Xbox hackers to crack down on illegal mod chips ■ Fujitsu promises to replace 3,00,000 HDDs due to faulty semiconductors

Porn company wants Napster

Private Media Group, a pronography firm, offered to acquire the Napster trademark and the Napster.com Internet address for 1 million shares of Private Media stock. The company said that it planned to create a peer-topeer network that would promote the sharing of pornography. It would also sell pornographic material on the site. "Along with Hollywood and the recording industry, we have become increasingly concerned about the level of copyright infringement inherent in free peer-to-peer file swapping services," said Charles Prast, president and



chief executive officer of Private Media. "We intend to use the strength of the Napster trademark to build a community for adults to share our content." The announcement came less than two weeks after a bankruptcy court judge blocked Napster's sale to German media giant Bertelsmann AG who offered over \$15 million, plus \$85 million in loans to keep the file-swapping service in operation while it was being pursued through the courts for copyright infringement.

<u>snapshot</u>

Steve Jobs is the highest-paid executive, collecting \$43.5 million in 2002

Source: Economic Research Institute

Kill spammers... literally!

An online game offering virtual revenge on spammers is gaining cult status as Netizens queue up to take out their frustrations at receiving spam.



If only this wasn't a game!

Torture a Spammer was devised by a US company, Marketing-Sherpa, after the theft and misuse of more than 10 million of its customers' e-mail addresses.

Apparently, an ex-employee of SparkList.com, its mailing list host, sold a backup copy of the list to spammers.

Various icons represent different kinds of spammers such as a blond in a red bikini for pornography, a purple and white pill for the Viagra e-mails and a man in a trench coat as an online salesman. Players can choose their method of attack from gruesome punishments such as boiling oil

and flying killer monkeys. You can play Torture a Spammer at http://torturegame.emailsherpa.com/.

Vulnerability reporting guidelines

Eleven software makers and security firms have announced the formation of a group called the Organization for Internet Safety (OIS, www.oisafety.org), which intends to set down rules regarding how the security community should responsibly release information on

software flaws. The members of the group include security c o m p a n i e s @Stake, Bind-View, Found-

stone, Guardent, ISS, NAI, and Symantec as well as soft-ware makers Caldera International, Microsoft, Oracle and SGI. They hope to bridge the gap between security firms and independent consultants who release information about flaws to grab media attention and the software companies that frequently find themselves with egg on their face over the holes in their applications. "Today,

there are no agreed-upon processes for handling security vulnerabilities," the group said. "The lack of any consensus procedures complicates the process of fixing vulnerabilities, and ultimately increases the risk that all computer users face."

OIS will only provide

guidelines and no enforcement mechanism will be advocated. Earlier this year, a draft of such guidelines was

submitted to the Internet Engineering Task Force (IETF), only to be turned down as being outside IETF's purview. The proposed rules suggest that companies respond to security researchers within a week of being notified of a potential flaw and that researchers give software companies at least 30 days to fix the flaw before making information about it public.



Cyberlaws

A 28-year-old computer engineer from UK was sentenced to 18 months for hacking into a firm's database. A Russian hacker was sentenced to three years in prison for a computer crime. A 21-year-old man has been arrested and his equipment seized for the creation of the Linux TOrn virus.

P2P Services

The operator of the KaZaA music-swapping service announced a partnership with one of Europe's major Internet access providers in a deal that underscores their mutual benefit from a method of exchanging songs that has raised the ire of record companies worldwide.



Advertising invading games

Electronic Arts has struck product placement deals with McDonalds and Intel for *Sims Online*. Chipzilla and Burgerzilla will feature in the game, while players will be able to open a virtual McDonalds franchise and eating there will give them more points. Intel introduces Pentium branding and the Intel Inside jingle.

Storage technology

DataPlay, a start-up that developed a new secure media format to replace the CD, has shut down, at least temporarily for new funding. Major record labels had supported the format and DataPlay expected to have discs on the market by the end of October 2002.

Dell offers free processor upgrades on Latitude notebooks Nokia unveils 3G phone that captures video clips Sun to ship Solaris 9 for x86 at \$99

Global measures

Miles of fibre-optic cable may answer a question first tackled by the ancient Greeks: How big is the Earth?

In a recent paper, Youngstown State University physics teacher

Michael Crescimanno describes how
computer signals
travelling undersea through
buried fibre-optic
cables can be used
to quickly and easily estimate the size
of the planet. "The

traceroute utility on any computer connected to the Internet can be used to record the round-trip time for small Internet packets between major Internet traffic hubs,"

he explains. Crescimanno's students have developed the traceroute experiment as an inexpensive way to involve introductory physics

hands-on use of

students

and to teach them about systematics in data.

Unfortunately, the Earth's topography hinders perfectly accurate measurements because cables are not laid precisely along great circles. Crescimanno has attempted to find some means of errorcorrection by comparing road and straight-line distances between eight Ohio cities. Traceroute-based measurements of the Earth's radius yield errors similar to his findings of a 20 per cent difference between the Ohio cities.

IDF 2002

While all of America was mourning on September 11, San Jose, California was buzzing with activity as the Intel Developer Forum (IDF) showed off some of the latest technologies and developments from September 9 to 12. Frank Spindler, vice president of Corporate Technology Group, outlined the key subjects of the forum. The schedule was tightly packed with briefings, conferences, demonstration of products and technologies and special parties, but that didn't stop Intel from throwing in tennis and game tables for people to relax. All in all, the forum was a technological paradise. You can visit the official site for the forum at www.intel.com/idf/us/fall2002/ index.htm.

<u>snaps</u>hot

IT spending worldwide expected to total \$2.3 trillion in 2002 and to rise to \$2.4 trillion in 2003

Source: Gartner Dataquest

Never buy a game again

Quum)

Yahoo!, always a path-setter of one kind or another, now brings Yahoo! Games, which serves 4.5 billion minutes of game time to 8 million players each month. The site peaks each day with about 1,50,000 simultaneous players and now Yahoo! hopes to work around the troubles of renting games by doing it online. On September 23, they launched their Yahoo!



allows broadband PC users to rent titles at very competitive prices. Yahoo! has overcome security issues by using a custom client for playing the games, so you never download the whole package, and some of the biggest game publishers have teamed up with them.

Currently there are 40 titles available for rent at http://gamesondemand.yahoo.com, and all you need to do is login to the Yahoo! Games On Demand service and pay for a rental. A three day rental for one game costs \$4.95 (approx Rs 250). You can also get a package deal at higher prices, for as long as a month.

Apple teaming up with IBM

BM Microelectronics is working with Apple on a 64-bit PowerPC processor for use in Apple's high-end desktops and servers. Apple is testing the CPU, dubbed the GigaProcessor Ultralite (GPUL), on Mac OS X hardware and making sure that the processor complies with a new bus architecture for future Macs. In addition, IBM plans to offer the processor as the centrepiece of future Linuxbased systems. GPUL, produced on 130 nm technology,

is expected to run in the 1.4-2.0 GHz range and will double the Mac performance. While the power-hungry

Power4 is designed for servers, GPUL is reportedly cooler and more compact, comparing in size to Intel's

Celeron. However, GPUL will inherit many Power4 performance advantages, such as being able to perform more instructions per clock cycle than current PowerPC chips. GPUL will be a multi-core chip, with two or four processors in one package. Having the processors closer together

and sharing the same cache will make for faster multiprocessing environments.

However, it is not yet clear whether applications would need to be rewritten to take advantage of this architecture.

Benchmarks and applications tests show that a 1 GHz

GPUL processor provides double the performance of a 1 GHz Motorola PowerPC G4 processor. GPUL will support Vector/SIMD Multimedia

> Extensions (VMX), a group of 162 instructions that speed data processing and algorithm-

intensive tasks, such as multimedia creation and display. VMX has been designed to be compatible with Altivec multimedia extensions currently used in the PowerPC G4.



■ W3C proposes two methods to encrypt XML documents ■ Warner Bros to make movie based on DOOM ■ Foldable computers on the way

Hacker's laptop on auction

n online auction of the Atwo laptops used to hack major corporations could get convicted cyber criminal Kevin Mitnick a tidy sum. In an effort to help finance a legal battle to regain his radio operator's license, the onetime hacker is auctioning the two Toshiba Satellite notebooks seized by law enforcement officers at eBay. "These were the laptops used to hack into companies and Shimomura's computers," Mitnick said. Tsutomu Shimomura, a senior fellow at the San Diego Supercomputer Center, helped track down Mitnick in 1995 after the hacker broke into the computer scientist's server the previous year.

The first laptop has a 486DX processor, 4 MB of RAM and a 200 MB hard drive with Windows 95 installed. Bidding on the machine reached \$9,200 (approx Rs 4,60,000) at the time of going to press. The second laptop sports an Intel 486SX processor and is marked with the dust used to lift fingerprints. This one has gone up to \$6,000 (approx Rs 3,00,000).

Both the laptops have been signed by Mitnick and Steve Wozniak, co-founder of Apple Computer and come with a copy of the FBI evidence form listing the make, model and serial numbers of the computers.

<u>snapshot</u>

Number of broadband connections in UK doubled since May 2002 to reach 1 million

Source: Oftel

Mobile P2P

Apeera reckons that and MMS can mobile phones can act as nodes in vast peer-to-peer networks and aims to supply use the mobile subscribers with a personal network-based repository for content such as ring tones, games, etc.

Technologies and MMS can ed to get a lattempts use the market before the market of the

nology lets users share this content and applications, boosting traffic on service provider networks and spurring adoption of the latest Java-based mobile phones.

tech-

Apeera's

Technologies such as GPRS and MMS can also be expected to get a boost, alongside attempts by operators to use the network to boost

marketing initiatives.
P2P networks
bring with them a
host of issues
ranging from
Digital Rights
Management to
mobile phone

batteries and bandwidth to support such services. Then there's security issues, especially since mobile phones are beginning to hold more and more data.

Jackpot!

A new trend has people making loads of money playing games online. Mary Dion, a former accountant, has given up a



big job to become a professional online solitaire player at WorldWinner (www.worldwinner.com). Such sites call it 'skill-based gaming' to distinguish themselves from gambling sites. The games are simple and the business model straightforward. Customers pay a small entry fee, the site takes a cut from it, and the rest goes into a pot to be claimed by the top player.

quoteworthy

"Every new generation of consoles increases the capabilities of what we can do by five times. That's what we need to prepare for. We have to increase our skill-set."

Bruce McMillan, executive vice president of Electronic Arts' Worldwide Studios, which is responsible for several of this year's top games including *Medal of Honor*, sees the gaming industry growing to be more and more complex and even attracting some of Hollywood's best talent

"We have the lowest tariffs in the world and they can fall (further) by up to 20-30 per cent."

T.V. Ramachandran, director general of the Cellular Operators Association of India (COAI), on the growth of mobile services in India

tomorrow'stechnology

Spinning a new technology

Ohio State University has made inroads into a new field of technology called Spintronics, by dispensing with conventional chip-fabricating materials like silicon or gallium arsenide, for plastics. Temperatures within a computer reach as high as 50 degrees C, rendering this technology useless in the past. But a new polymer called vanadium tetracyanoethanide exhibits magnetic characteris-

tics even at high temperatures, thus jumping over this hurdle.

Experiments have proved that a magnetic field can be used to polarise the spin of an electron. This is the first step towards enabling plastics to be used to store information. The advantage with Spintronics is that an electron retains its spin until it is changed by an external magnetic field. This implies that data is retained even after power is

switched off. This would also give rise to instant boot-up computers, since the information is already retained and can be accessed rapidly. While today's inorganic semiconductors are fabricated using multiple stages of vacuum deposition and etching, plastic semiconductors could theoretically be as simple to produce as using inkjet technology to print chips on large sheets of plastic.

■ MTV to make rags to riches movie on Napster's founder ■ Sharp's lab develops 3-D flat screen ■ Charles Simonyi, creator of Word, Excel leaves MS



Write again

Dest Watt,

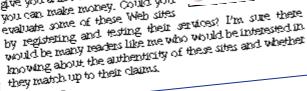
I am a regular reacter of Digit since February 1999 and have found that it is the best PC technology magazine in India. I have an LG-80808 6x4x3 2x CD-Witter and am quite satisfied with its performance. But since there are much faster sinces available in the market no wadays, I'm planning to purchase a new dire. I've heard rumours that CDs written at such high specision these new drives are not recognized by some CD-ROM drives and home and o systems. Can you do a comparison test for CD-Writers once again? his*e-mai*i

digit We're aware that the technology for CD-Writers is evolving rather rap-

idly with faster drives being released ever so often. This reminds us of the mid-1990s where we witnessed a similar trend with CD-ROM drives, but now the CD-ROM is something we take for granted just like the ubiquitous floppy drive. For this very reason we're carrying an addendum to our February 2002 CD-Writer shootout this month. Turn to page 56 for a spanking new CD-Writer shootout, but be warned, there are a few surprises along the way!

working@Home

I've seen many acts in national newspapers proclaiming "Work, for 2-3 hours from home and make money on the Net". I've personally contacted quite a few such advertisers and found that they simply charge Ps 400 to Ps 1,200 to give you a list of Web sites where you can make money. Could you



Mys Konnaviben Visenail

Dear Mrs Kinnariben,

Sounds like an interesting story. We'll definitely explore the pos sibility of carrying it in an upcoming issue. In the meantime, you could check out a similar article we've carried in our February 2002 issue titled 'Make Your PC an Earning Member'. This article is also featured at www.thinkdigit.com/connect/firsthand/ stories/38586.html.



digit

written artefacts

I know this letter is late, but as they say, better late th never. The article on 3D chips in the August 2002 issue o mediocre. Even though you have explained about Pixel a Vertex Shaders and the gaming realism they provide, have failed to mention that these features are absent in GEFORCES MOV. Chips as well as the older GeForce? To MN chips. Additionally, calling the game CPU sensitive then calling the CPU the system bottleneck (Coma test, page 69) are one and the same thing in both. Chi. assime is the only solution

Alben Fernandes lismus siy

Dear Alston

You've made some astute observations. The fact that the chipeets don't have DirectX8.1 features (namely Vertex/Pixel Sh has been clearly mentioned in the 'Graphics Chipsets at a G table on Page 72-73. As far as your comment about Comand concerned, a CPU-sensitive game engine is not quite the same a system processor being a bottleneck. A CPU sensitive engine not offload rendering tasks to the GPU as next-generation g engines do. Because we don't know the internal functioning Comanche rendering engine, we can only make an observation you will find that the poor performance of the graphics chips are uted to either a CPU sensitive game engine or a slow processor test system The solution, as you rightly pointed out, is the same i cases: CPU scaling, but the cause can be either.

Linux is your karma

 $H_{i,Guy_{\delta_i}}$

You keep talking about software piracy, but do lit promote Linux, the most practical alternativ Windows. I think you owe it to your readers to inc Linux distributions on a regular basis. You could of special subscription scheme at a higher price where increase the number of CDs to three and use the a tional CD to provide regular Linux software and new tributions. Or you could add a third Linux CD with 20 cent of your newsstand copies and charge a slight pre um over your regular cover price to recover the increa production costs.

Annit Kunda Ka Via e-mail

Hi Amit

Your suggestions have some merit but doing this as a reexercise is something that would need careful thought research as we're not too sure how many of our readers v be willing to pay extra for their Linux fix every month. That we'll continue to offer newer Linux distributions at periodic vals similar to the Ivandrake 8.2 CD we bundled with our 2002 anniversary issue.

Q. What type of interface would you prefer on the Digit CDs?

•		
HTML	Director	Doesn't matter
49%	33%	18%

Watch out for a cool new HTML interface from January 2003!

This month's question:

"What do you think about Digit's uniqu half-flap covers?"

Log on to www.thinkdigit.com and vote

secure enough

You have concluded your October editorial Dear Virnit, stating that anytodo who uses a PC is in some way responsible for preserving the security of the lest of the world and that prevention is better than ture. True, but it's not always possible. You can either make something so secure that ordy a familial of people can use it, or you can create a system that is easy to use for most people and compromise security in the batgain. Windows is a plima example of the latter. Even if you were to build a fortiess, it will never be impregnable Herice, there is no real prevention for security lapses.

Hrishikesh ұйа*е-т*ай

Dear Hrishikesh.

The real security threat here is the people who exploit these technological loopholes and not the technology as such. Security will always be an issue till there are challenges for hackers to meet. Virus authors will always try to create newer, better viruses—it's their way of finding self worth and gaining boasting rights. Till we all don't grow up and consider the ramifications of our actions on the people around us, the only solution would be to educate and create awareness about the problem. That is the only way to ensure prevention.

Don't you like me?

Hey Guys,

Fwe been regularly sending my PC problems to sos@jasubhai.com, but none of

them have been teatured in the maga. zine. Please let me know if the address is comect. I/ve managed to solve most of my gueries myself, but it

did take me a long time to find the correct information. Anyway, do keep up the good work! Aditya Rumai Shaima Via e-mail

Hi Aditya,

digit

Wego through hundreds of e-mail every month and featuring the mall in the Q&A section is just not possible because of space constraints. Hence, we select letters where the problem is more universal, so as to provide a generic solution for other computer users. Also, guaranteeing a personalised answer to each e-mail or promising to solve every computer problem that's thrown our way might sound exciting, but is quite unrealistic.



My Dad had been asking me for a his cassette collection, and I told him that it was not possible without purchasing specialised hardware. But after reading the 30 Minutes kamal hail"

K. Poornachandra Via e-mail

digit Shihhi...not so loud! We don't want to let the cat out of the bag that it's possible to convert your old audiocassettes into digital MP3s. Imagine the sleepless nights this would give the recording industry(-)

Bhakti geet

Hi Vinit, long time to record a few devotional songs on the family computer from Expert in the October issue, I've finally managed to fulfil his request! On being asked how I managed to accomplish this seemingly impossible task, I teplied: "Sub Fuck Digit ka

Short Bytes Filtered by Digit

Hi Guys,

I simply love Digit and eagerly await the begir of the month when I c get my hands on the n issue of Digit. In today of hyped up marketing product peddling, Digi helps in sorting throug the clutter. Keep up th good work.

Aditya Kumar Sharma Via e-mail

Free Linux

Hi Vinit.

Here is a tip for people don't want to spend 11 grand on Red Hat Linu (reviewed in the Octob issue). Go to any books and buy the book titled Hat Linux 7.3 Bible and you'll get the three ins tion disks free! Okay, se book costs Rs 499, but i still a bargain when co pared to the retail box.

Anu Via e-mail

- The Top Guns story on P 122 (Digit, September 200): incorrectly credits the "Wh you need besides a mirac quote from the movie *The* to Trinity, when it was actu said by Tang. Thanks to Ma Ignatius for pointing this o
- It took Monish Prem's € eyes to point out that in t graph on Page 78 of the ! tem Suites test (Digit, Oct 2002), we've interchange defrag times taken by No SystemWorks 2002 and Ontrack SystemSuite 4.0.
- In the Bazaar section of October 2002 issue, we w mentioned Visualan Tech gies as the contact for Me MP3-VCD Player (Page 82 Mercury Pocket DV Came (Page 86). The correct cor Kobian India Pvt Ltd (Phor 080-5566626)

Notice any goof-ups? Write to goof@jasubhai.com

Ban that spam!

Dear Minit

Thank you for the useful article in the October 2002 issue, 'Spain-protect Your Indox', where you're made a pecial mention of Hotmail pain filters I had a terrible problem with my Hotmail account Even though I would only use my Hotmail ID for chatting I used to receive loads of junk mail I always wondered "Howon earth did they get my address?" Now thanks to this article. The learnt how to configure the anti-spam filters on my Hotmail account Y.K. D'Solva

УІв е-р_{іві}ў

I'm sure that most of us wouldn't mind sparm too much if they offered authentic deals and useful information. But the absence of governing bodies and the extremely low costs of e-mail marketing are responsible for making sparmone of the worst disasters on the Internet. We can help discourage spammers by supporting services such. as SpamNet (www.cloudmark.com), Hopefully, in the years to come, a few of these services will become successful in combating spam.

> Send your letters marked 'Readers Letters' to the Digit office: D-222/2, MIDC, TTC Industrial Estate, Om Sagar Building, Nerul, Navi Mumbai 400 706, Phone: 022-7629191/9200 Fax: 022-7629224 E-mail: readersletters@jasubhai.com

digit 29

NOVEMBE



One for the Road

Call them work buddies or play mates—the new generation of mobile devices will make you forget about pixellated screens, skimpy applications and arcane user interfaces

ith your assortment of portable devices—a PDA, a smart phone, a digital diary—you think you are the king of computing on the go, but you often wish that you could do more with these devices. That you could play more than chess or do more than read an e-book or listen to MP3 music when you are bored with that in-flight movie. That you could go beyond just light editing of your Word and Excel files on your PDA. That you wouldn't miss your laptop so much.

Handheld devices already let you take notes, schedule your day, catch up on e-mail messages or plug in headphones to listen to MP3s during your daily jog. You can even use them as a stand-in for times when you cannot or don't want to take your laptop with you. But they fall just short of being the complete companion for your computing needs on the road.

This void for a portable device that is somewhere between a laptop and a desktop in its computing power and is still small, is being filled by a slew of futuristic portable computers. These new devices incorporate technologies that

In 2001, only 3 per cent of the 111 million mobile-phone subscribers in America used a mobile data service but by 2006, 66 per cent of the 180 million mobile phone users will rely on data services

—Forrester Research

integrate several functions into an all-inone device that is also easy to use.

Take a tablet

You are on the way to work when the perfect idea for that new advertising campaign flashes in your mind. You flip out your PDA and tap in the idea before you lose it. It is cumbersome because the keyboard is cramped and the handwriting recognition software is rather basic. You'd rather jot your idea on a sheet of paper, but then you think that's a small price for the convenience of having your jottings in a digital format.

Take heart. The next generation of Smart Phones and PDAs is going to do something your mother can't—read your handwriting and understand what you're saying! Featuring handwriting and speech processing capabilities, these devices will be able to take down dictations and decipher little notes that you jot down and convert them into a digital format on the fly.

One such device is the tablet PC. First seen on the initial episodes of *Star Trek*, what was once a far-fetched idea is now manifesting into a practical gadget. It offers the most natural way to get information into a device—by writing directly onto it. Quite like a digital slate, this device can be carried around without the slightest inconvenience and used for scribbling down your ideas and diagrams.

Slightly larger than the A4 notepad in size, tablet PCs incorporate advanced speech and handwriting recognition technologies that decipher your scrawl as you write on the screen, while simul-

taneously converting it into a sear and editable digital format. As appeal to the professional in yome, it features specially modifiesions of Microsoft Word and Power letting you make notes in the mary the screen and save them as docreferences.

Acer's Travelmate 100 is on sub-notebook that can be converte a tablet PC by simply swivelling its 180 degrees and folding it back dow its keyboard. It features Microsoft Table PC OS, an extended version o dows XP Professional that incorp support for a touch screen and styli Numerous other brands such as To Fujitsu, NEC and Hewlett-Packard a bringing out devices based on th The Fujitsu Siemens LT P-600, for ple, is powered by a 600 MHz mobil processor and features an LCD screen that can be detached from th station for true mobility. It also feat Smart Card port that saves your when the device is not in use.

A more popular tablet composition Microsoft's own Tablet PC, which Windows Tablet PC OS. It mimics to fa pen and paper. The entire scripressure sensitive—pressing the harder causes bolder screen strok with a pencil. And to erase your wisimply flip the stylus around and away! There's even a digital journal allows you to scribble on an interfaresembles a journal page—and yotings are completely searchable for reference, all on the fly!

The 'Digital Ink' is so versatil interoperable that you can select

of your scribbling and copy them into conventional applications such as Word and even your messenger client!

The rocket in your pocket

Maybe you are a sales executive, en route to a client's office. You receive a phone call saying that some specifications of the product have undergone last minute changes. If you have one of these new handhelds, all you need to do is log into the company network using the wireless Internet access, pull down the latest specifications and integrate them into your

802.11b wireless networking, handwriting recognition and an 866 MHz P-III processor

PowerPoint presentation—all on the trip to the clients office!

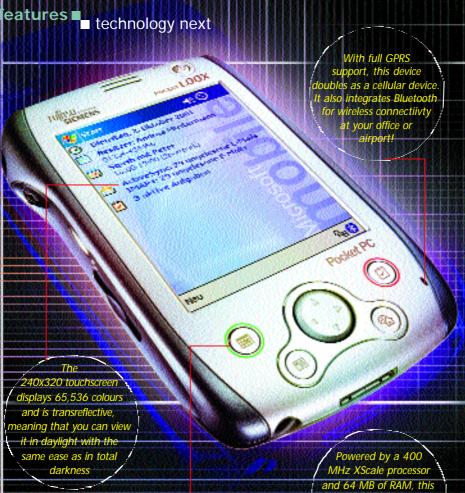
Sounds too good to be true? Going one step smaller, the next regiment of road warriors are represented by PDAs. These little handheld devices have jumped manifold in everything, from processing power, to applications and

Sony Clié PEG-NR70V.

The O2 XDA is quit thing for those who need t connected at all times—it like a conventional Pocket P

inside it lurk GPRS support, POP3 e Instant Messengers and even a phone! The bright full-colour 24 resolution shows off rich multicontent and its connectivity of never keep you away from your va information for long.

Also impressive is the F Siemens Pocket LOOX, one of the



sor. Running at a speed of 400 MH handheld device has everything would need—applications, committion and mobile entertainment. B integrating GPRS support for high mobile connectivity, it's also Blue capable, enabling you to tap into office network, without being and to your desk. It can even be hooked your laptop or mobile phone for en wireless connectivity. And yes, it cessing power lets you watch movie ers right off the Web with TV-q imaging!

devices to use Intel's new XScale p

Another interesting device is Sony Clié PEG-NR70V, which feat compact QWERTY keyboard as a pits flip-screen design. With a 320 resolution, 16-bit colour screen are audio support, this device runs Palm OS. Most importantly, its tionality can be supplemented whost of other devices such as a cam and MP3s that can be stored.

Phones get smarter

Using the existing cell phones, yo already access services such as WA SMS-based movie schedules that service providers offer. But what could even book your favourite through your cell phone itself? about even finding directions to that atre? Followed by recommendation good North Indian restaurant close

When they first arrived on the about five years ago, mobile p served a single purpose: to keep yo nected to the rest of the world via Today, with enhancements in po processing power and wireless tech gy, mobile phones are no longer reed to voice; they can transfer

through Short Messaging Service (SMS) and with large, colour displays that are touch screen capable, broadband Internet access and robust processing power, the new

with full MP3 support, the Fujitsu-Siemens SX45 handheld even sports

GPRS for cellular connectivity

MHz XScale processor
and 64 MB of RAM, this
handheld has what it takes
to crunch through your

Power that Lasts

With all that increased processing power, bigger and brighter screens and increased storage, the new-generation mobile devices need enough juice to survive on the road. Intel's Banias, expected to surface in the first quarter of 2003, is one of the many technologies that strive to minimise the power usage of these mobile devices.

Mobile processors based on Banias are capable of dynamically altering their clock speed depending upon the application. A process called Advanced Clock Gating implements power conservation by shutting off unneeded sections of the processor core, even when the rest of the processor is in operation.

Besides optimised power consumption, Banias also intends to include dual-band 802.11a and 802.11b chipsets for facilitating wireless LAN support. Capable of running Windows XP and Windows 2000, mobile computers using Banias processors will consume a watt of power and have a battery life of between 3.5 to 4.5 hours for machines with 14 to 15-inch screens.

There is also a low voltage (LV) version of the chip that will be used on sub-note-books and tablet PCs and will consume just half a watt of power. One chipset running these processors is codenamed Odem. It features DDR 266 support and is expected to be released in early 2003. Another chipset supporting Banias is codenamed Montara GM and will be targeted at mini notebooks, sub-notebooks and tablet PCs.

These chips will feature a minimal number of interface points for easy integration. The first Banias chips will appear in the first quarter of 2003 and will offer speeds of 1.4 GHz, 1.5 GHz and 1.6 GHz, using the Odem chipset.

breed of cellular phones has graduated into truly smart phones.

In some of the newer phones on the block, we see the convergence of cellular, PDA, as well as imaging technologies. Some even boast of an integrated digital camera, which is capable of capturing images and storing them on the inbuilt memory. For instance, the Nokia 7650 features a brilliant 176x208 pixel colour screen with full PDA functionality. Another phone that integrates a digital camera is the Sony Ericsson T68i, where the Web cam component can be added on to the basic GPRS capable phone—all this with a very small sacrifice in size.

Just rising on the horizon is a smooth blend of PDAs and cellular phones seen in phones such as the Sony Ericsson T800. This phone is for work and for play—you can type in your reports, schedule meetings and play a game. Its keypad folds over to reveal the 208x320 touch screen that can be navigated with a digital camera is integrated on the rear, much like the Nokia 7650. Pictures are stored on 12 MB of internal memory, which can also be supplemented with a 16 MB Memory Stick. It sports Bluetooth and infrared, and is capable of downloading Java applications such as games. The

phone is based on the Symbian 7 operating system.

Another phone that combines funk with innovative features is the Samsung 500, whose flip-open design conceals a full colour screen and has full GPRS support-all in a surprisingly small package.

These new breeds of tablet computers, PDAs and Smart

The tiny Samsung SGH-T100 weighs in at 87 gms and sports a 128x160 flip-top colour

The Brains Behind the

PDAs and Smart Phones will be capa of handling full motion (30 fps) vide easily as they would handle mobile q ing and 3G communication. Devices the HP iPAQ H3950, Pocket LOOX 6 Toshiba Genio E550G and O2 XDA, based on newer processors like Intel's XScale chips are redefining the mear of mobile computing power.

The XScale processors are availab two variants—the PXA250 (400 MH; 300 MHz and 200 MHz) and the PXA210 (200 MHz and 133 MHz). T consume up to one-third of the pow their predecessors, the StrongARM processors. The PXA250 is aimed at handheld computers, while the PXA: is tailored for entry-level handhelds a cell phones. These processors also in porate advanced power managemer

By integrating memory and LCD trollers onto the chip itself, they redu the number of components in the h helds they are used in. Both these processors come with 64 KB of cache and feature Intel's Integrated Performance Primitives (IPP), which provic built functions for signal processing speech and handwriting recognition MP3 codecs, MPEG-4 and H.263 vid conferencing codes. They also featur Windows CE .Net support.

Besides these processors, there ar slew of other devices, like the Handspring Treo 270 based on the 33 MF Dragonball VZ processor and the HP nada 928, based on the 133 MHz TI OMAP710 processor.

All these enhancements indicate the new super-breed of handhelds at Smart Phones will enable users to rul applications that were never thought possible, at speeds never experience before.

Phones blur the lines between c communication and portable co ing with full video, audio and a tion support. Armed with any of new devices, you can finally expe true freedom from the desktop. ready to romp around the world don't forget to take your with you!

MARCO [

Mini-PC TX2 Small Factor PC >>> Size doesn't matter!

At 156x146x56 mm and 1.1 kg, you won't find too many smaller PCs that pack such punch. Aimed as a desktop replacement, the TX2 is powered by an Intel 1.3 GHz Tualatin processor, with up to 512 MB RAM, a DVD/CD-RW combo drive and a 30 GB hard drive. Every free inch of the Mini-PC is adorned with ports, including an S-Video, two FireWire, four USB, an IrDA and a 10/100 baseT Ethernet.

Web site: www.worldssmallestpc.com



You know you want them. Yes you do. Go on, admit it!

Bose MediaMates Computer Speakers ►► Sing away those blues

With these cool blue speakers, Bose brings its trademark sense of design and engineering to a new arena—the PC. The lack of a dedicated subwoofer is not apparent as the MediaMates use a proprietary 2.5-inch full-range driver, producing full bass and clean highs. The patented spaciousness-enhancing circuitry provides an audio experience that seems to come from a sound-stage wider than the two speakers. And for those who tend to multitask, the speakers' dual inputs allow you to use another source, such as an MP3 player, even while the speakers are connected to your computer!

Web site: www.bose.com



THE OUTSTANDING QUALITY OF DIGIT ZERO 1 AWARDS ISSUE



+



2 FASTFORWARD
INTERACTIVE
LEARNING CDs





1 Toshiba PDR-T10 Digital Camera Look mom, no buttons!

With the PDR-T10 it's possible to change the appearance of your digital camera to your liking. The Toshiba PDR-T10 is the first digicam to incorporate an interactive touch screen for operations—there's just one shutter button; all the other settings are made through its 1.6-inch LCD screen. But there's a lot more to the PDR-T10 than just its looks—it has a 2.0 mega-pixel CCD sensor with all the bells and whistles (4x digital zoom, white-balance controls, multiple flash modes, USB connectivity) and stores JPEG images at an impressive 1600x1200 resolution using a Secure Digital memory card.

Web site: www.toshiba.com



▼ Terratec C.A.R. 4000 Digital Audio Centre

The complete package

The C.A.R. 4000 combines a digital audio recorder, CD player and jukebox in one nifty package. The various audio inputs (two Line-ins, two Mics, one Digital) record an audio signal from your PC or any other audio equipment, digitise it and save it on the in-built 30 GB hard disk. It can also play ordinary audio CDs and MP3 CDs or Winamp playlists (M3U). With CDDB support for automatic detection of artiste, title and album information, configurable playlists, USB connectivity with a PC and MMC memory card support, this wonder offers all that you would expect from an up-to-date Hi-Fi device.

Web site: www.terratec.net





★ SanDisk Cruzer Thumb Drive

Flash in the pocket

Most Flash drives have fixed capacities, so if you need to carry more data than your drive can hold, you'll need to buy a larger drive. But the SanDisk Cruzer uses a stamp-sized, digital camera compatible Secure Digital (SD) Flash memory, which you can swap with other or higher capacity SD cards. The Cruzer plugs in directly into any USB 1.1 port, works without any driver installation and is compatible with both PCs and Macs. Its stylish, compact design allows it to be dropped into any pocket and it even offers basic encryption via its bundled software to provide data security in case you misplace it! Web site: www.sandisk.com

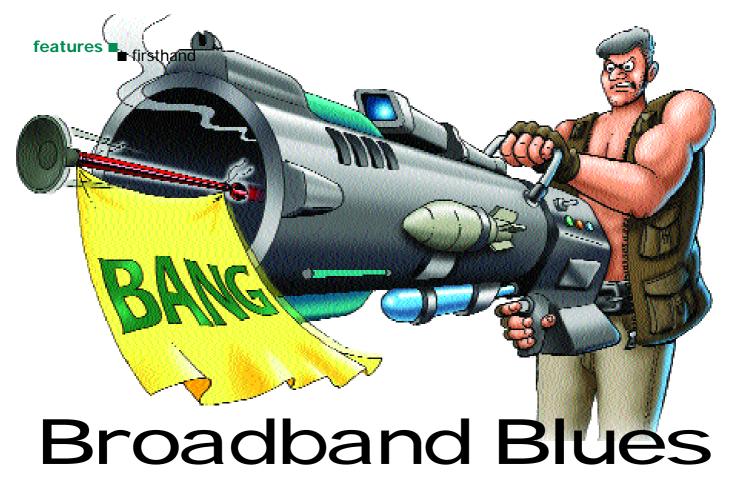




Essential Handbooks are brought to you by







Dreams of high-speed Internet access wither in the face of reality

II You promised me heaven,

then put me through hell ## —JON BON JOVI

he sentiment reflected in these words has touched our collective soul at one point or another. The reasons for crooning those lyrics can be many: Bon Jovi obviously had an unhappy tryst with a heartbreaker, a situation that might seem painfully familiar to most of us; while others find themselves humming the line as they surf the Internet. Shattered hearts or pulled out hair, the source of the pain remains the same: promises broken, potential unrealised.

While we would love to delve into the world of romance and poetry, lets stick to the subject at hand. Broadband has become a household name, synonymous with high-speed Internet access and one that conjures visions of streaming movies while videoconferencing with your aunt in England, even as you download the latest songs. Unfortunately, like most visions, this one too goes up in smoke when scorched by the unforgiving flames of reality. So what is this 'broadband' thing anyway, and do we, as a higher species really need it?

Let's get a little technical. Broadband refers to any type of transmission technique that carries several data channels over a common wire. A DSL (Digital Subscriber Line) service, for example, combines separate voice and data channels over a single telephone line—voice fills the low end of the frequency spectrum and data (which can in turn be audio, video and text) fills the high end. While this might seem like a nice thing to do to a wire, what really excites is the speed that such a connection can deliver. Consider Cable technology: it can theoretically achieve net-

working speeds of approximately 30 Mbps; now compare it to the measly 56 KBps that the best dial-up connection can offer and the contrast seems bewildering; even a DSL line can touch speeds of up to 10 Mbps. A broadband connection is thus a good thing, like a hefty bank balance; but as we will soon find out the analogy goes further—for much like a burgeoning wallet, a speedy Internet connection is also reduced to being just a pipe dream for the most of us.

Fight the system

Our story begins with a broadband service that should theoretically deliver the most bang for the buck, Internet over optic fibres. Like all sad tales, this one begins with a little flashback: A 'last-mile connection' refers to the means by which a service provider delivers Internet to your home. Most providers rely on existing infrastructure and thus the last-mile consists of wires that belong to institutes such as BSNL and MTNL. Some providers, though, such as BSES TeleCom Ltd (BTL) rely on their own cabling, thanks largely to the nature of the solution they offer. BTL thus delivers a lastmile as a combination of fibre and Cat-5 cable: optic fibres deliver the Internet to a hub near you (typically a power terminal), from where cables emanate and transport packets of data to your home. BTL's broadband service, termed Powersurfer, thus seems to be the best of the bunch at first glance; it uses optic fibres after all. Practically though, the service has been marred by long installation periods and slow access speeds.

Take the case of Rafique Ilani, a Mumbai resident. He signed up for Powersurfer by making a down payment of Rs 3,500 as installation charges and was promised a connection within a month. Since BTL had to lay the optic cabling required, they needed permission from both MTNL and the Municipal Council

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to dig up the road next to Ilani's place. The month soon became two, then three and much to his chagrin, the promised connection was still missing in action six months after he had paid in cash. "Every time I called their franchisee, they would promise to get back to me in a few hours; would then invariably explain that the digging work is taking longer than expected and is expected to get over in a few weeks." So why did Ilani not ask for a refund and get out of the service when he should have? He explains, "Because, in the interim months, Powersurfer had increased the installation charges by about Rs 1,000. I thought that I had a good deal and I did not wish to give it up. After all, they promised a Net connection over optic fibres, it was too tempting an offer to pass up."

As Ilani would soon find out, it was the last-mile connect that was to be the undoing of his desire to get a fast connection to the Net. "After a period that must have been close to six months, I learned that I would have to settle for a refund since my residence was situated too far away for them to supply the last-mile connects. They had connected a cyber-cafe some 300 metres from my place, a distance that was apparently 'impractical' for them to cover with the requisite cabling," he fumes.

While Ilani's case reads like a typical botch-up job, those who did get connected to the Net via Powersurfer experience various levels of customer satisfaction: there are those who are content with what BTL offers, while others are terribly disappointed by the browsing speed, considering the fact that an optic fibre should

Lots of promises and assurances but all potholed in unexpected difficulties and problems—most of them concerning lack of transparency, miscommunication and above all, no sense of responsibility

-Raja Sagar, a Powersurfer customer

deliver a blazing experience. "It's the worst connection you could ever have," attests Vince Fern, a broadband user over an online forum. "I tested it for speed on a regular day, in the evening and found it to be just 16 Kbps. I can't even listen to a 28 Kbps online radio." Fern then goes on to attack their customer service: "Their helpline number has a peon who only speaks in Marathi and I am supposed to interact with him about speed and non-responsive pings! At the end of each complaint all this peon is programmed to say is 'mala kai mahiti nahi' (I don't know anything)."

Technology shmecnology

The idea of delivering the Internet over the same lines that bring you TV channels is an appealing one. The concept goes something like this: the wire that brings you cable TV has lots of unused room left on it. This unused bandwidth is used to deliver packets of data, the source of which can be anything—in the case of a broadband connect, the font being the Internet. The service provider will either have a private gateway to the Internet or will lease a line from another ISP such as VSNL. This Internet connection is then brought to a modem that combines the data from the Internet and the TV channel information onto a single cable, to be transmitted to subscribers. This flow of information from the service provider to an end-user is called the downstream data.

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features ■ firsthand

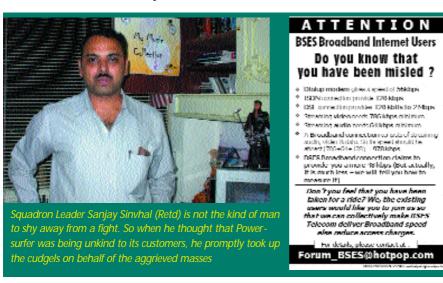
After the coupled signal reaches the users premises, another modem splits the pair; the cable channels head to your television and data from the Internet makes its way to your computer.

A segment of about 6 MHz is allotted to the Internet data, and such a segment is termed as a channel. This fixed capacity is enough to support up to a thousand subscribers. Problems arise when the number exceeds that mark. Aniruddha Gupte, a broadband hopeful, had subscribed to just such a service (7 Star Cable Network, which has leased lines from the ISP, NetMagic). He was promised browsing speeds around the 48 Kbps mark—not a true broadband connection for sure, but Gupte took solace in the fact that he would not have to pay monthly telephone bills and would be granted an always-on, dedicated line to the Net. He paid Rs 1,000 as installation charges and then dished out monthly rental charges that came up to an equal amount.

I am ready to switch back to dial-up: talk about backward compatibility!

—Aniruddha Gupte, bemoaning the fact that his broadband connection is slower than a dial-up line

As is financially feasible, Cable modems are only seen at select installations and most of the throughput is via switches and hubs installed on the terraces of buildings. Gupte found that he was connected in a similar way: a hub sits on the terrace of his building, connecting his and five other houses via a Cat-5 cable. The promised speed of 48 Kbps did make a brief appearance, but as new users were added, the speed quickly degraded and things reached such a stage that hitting a measly 20 Kbps mark (a dial-up connection offers twice as much speed!) was looked upon as miraculous. Needless to say, Gupte is an unhappy surfer. "The connection is worse than a dial-up line. The bandwidth is so bad that one site takes 3 to 4 minutes to load!" To further elucidate the fact that the bandwidth is being choked by the number of subscribers, Gupte presents this case: "Like everyone else, I like to chat on MSN when I am online. Sadly, just surfing the Internet takes up so much of the juice available that every time I visit a Web page, MSN thinks that the connection is dead and promptly signs off!" To ease the saturation of the allotted 6 MHz bandwidth, the service provider can add another channel



So you Think you Have Broadband?

1. How long does it take you to access a Web site?

- a. I just need to click my heels and the Web page loads
- b. A quick, two-minute noodle session and I am off surfing
- c. I always find the time to do my laundry in between Web pages

2. How long does it take you to download a music file from the Internet?

- a. You shall be mine post-lunch, O MP3 file!
- b. I have to keep the computer on overnight for the file to download
- Hey, I get the latest music albums before they are officially released

3. When was the last time you enjoyed a great action game online?

- a. Does a card game count?
- b. My ping rate is longer than my PIN code
- c. They call me a low-ping b*****!

4. Do you frequently chat with your girlfriend in the US using a Web cam?

- a. Yeah, but her mom keeps popping up (spoilsport!)
- b. Yes, but she lives across the street
- c. Hey, I'm grateful I can chat uninterrupted

5. Quicktime.com, quick what pops into your head?

- a. Ewww, Apple! (The grapes are sour, the grapes are sour, the...)
- b. Movies, masti, magic!
- c. Why won't they let me download those trailers?

Turn to page 41 for the score

and split the user base along the two. It is a solution that requires additional monetary investment. Gupte did complain to the con-

cerned party but till date no action has been taken. This is a problem that any Cable modem based service will eventually experience. DSL lines also face inherent problems. When you are closer to the provider's central office, the connection is faster for receiving data than it is for sending data over the Internet and is generally the costliest solution in the offing.

Barbed wire

As if these intrinsic walls were not enough to limit the user's experience, some providers put up barbed fences in the form of bandwidth caps. Such a cap is an artificial limit on the maximum speed a customer can achieve. This is done by monitoring their current usage and throttling network packets as and when necessary.

Why is such an act practised? The most common reason is that providers concerned about the capacity limits of their network may implement a short-term cap so that they can accommodate more customers without having to scale up their service infrastructure.

Retired Squadron Leader Sanjay Sinvhal faces just such an artificial hurdle: "I acquired a Powersurfer broadband connection a few months back from BSES Telecom, Mumbai. The browsing and downloads were blazing fast for the first couple of months and then suddenly I hit a roadblock. The speeds offered became painfully slow. After a lot of follow-up and complaints, what came out is that the download/browsing speeds will be between 48 Kbps to 64 Kbps only." This downgrading of speed formed what was officially termed as a 'Manageable network'. As Rajiv Sharaf, head of Customer Support at Powersurfer explains in a e-mail to Sinvhal, the port speed was restricted to 48 Kbps "for fine tuning of network and better bandwidth management". Sinvhal failed to see how this capped connection certified itself as broadband. "On a dial-up modem, I get connectivity at 56 Kbps. An ISDN connection provides 128 Kbps; a DSL connection provides 128 Kbps to 2 Mbps of speed; streaming video needs 786 Kbps minimum, streaming audio needs 64 Kbps minimum. A broadband consists of streaming audio, video and data. I thus fail to understand that if they have reduced the access speed to 48 Kbps, how can they sell the service as a broadband connection? Charging the subscribers for a broadband connection, without delivering is unethical, to say the least."

Only in India

It is obvious that as far as home users are concerned, a broadband connection is the proverbial white elephant in India. Internet access speeds offered by the best service providers seldom exceed 40 Kbps, when they should be touching the 1 Mbps mark. The reasons are largely financial and to a lesser degree infrastructural. Leasing lines from ISPs is an expensive deal and few can afford to set up their own Internet gateways. Consider a service provider that rents a 2 Mbps line with the intent of providing Internet over Cable. The customers are promised blazing speeds, and initially everyone seems to be happy. Word of their excellent service spreads and new users are brought under the wing. What follows is a vicious cycle—to be profitable, the service provider will not refuse the users who wish to sign on. The increased user-base will overload the limited bandwidth and

SCOREBOARD

	Question	а	b	С
	1	15	10	5
	2	10	5	15
300	3	5	10	15
	4	15	10	5
	5_	5	15	10

25-40 Tsk, tsk. You got what techies term a 'lemon' for a broadband connection

40-60 Hmmm. The signs are good, but we wouldn't hedge bets on your Internet connection

60-75 Wow, an Internet access God! Can we be best friends?

pretty soon there will be many distraught customers. It is a scenario that is not too uncommon. one that forces us to accept what is essentially an always-ondial-up-connection as a true broadband solution. Perhans the best recourse is to grit our teeth and bear it. Who amongst us, after all, has won against the system?

AHMED SHAIKH

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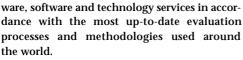
test drive ■ start up

How we Test

It looks good and the technology is glitzy, but does it do the job?

he Digital Media Test & Research Centre (DMTRC) conducts a series of elaborate tests to evaluate the merit of each hardware and software product. To ensure that our readers have all the information they need to make an informed buying decision, engineers at DMTRC evaluate and review the latest hard-







We use a dual rating system, the first of which is

applied to the Comparison Tests in which we compare the performance of products within a particular category.

Each product is evaluated under different parameters such as performance, value for money, features, warranty and support, etc.

Weightages are then applied to the various test parameters according to their importance for that particular category of products.

These weightages are then used to arrive at an overall grade for each individual product. An overall grade of A+, therefore, indicates that the product is close to perfection.



The Awards

Digit awards outstanding products by selecting a Best Performance and Best Value winner in each comparison test. The winner of the Best Performance Award will be the product that scored the highest in the performance segment of our tests.

This award represents the best performing product in our tests and doesn't factor in any other parameter such as value for money, features, support, etc. The winner of the Best Value Award will be the product that scores the highest in our value for money parameter which is derived



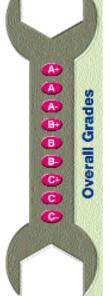
taking into account the ratio of a product's performance and features to its price. The product winning this award offers good performance at a great price.

In Bazaar

The second part of the rating system is used to evaluate individual hardware and software products in the Bazaar section. The evaluation covers parameters such as performance, ease of use, value for money and the build quality/features of the product in question and then arrives at an overall rating.

Here each of these parameters is given a weightage of 25 per cent and is rated on a scale of 5, which is represented by arrows ().

The greater the number of arrows, the better the product. This simple five-point rating system is designed to give you an easy-to-interpret assessment of a product. For example, a product that receives an overall score of five arrows signifies an outstanding buy!





In Test this Mo

This month we bring yo comprehensive, end-to-solution for your storage needs. We've benchmal evaluated and tortured IDE hard disk drives, 7 I drives, 11 CD-RW drives a set of 11 external storadevices ranging from ex nal CD-RW drives to Zig drives and portable hard



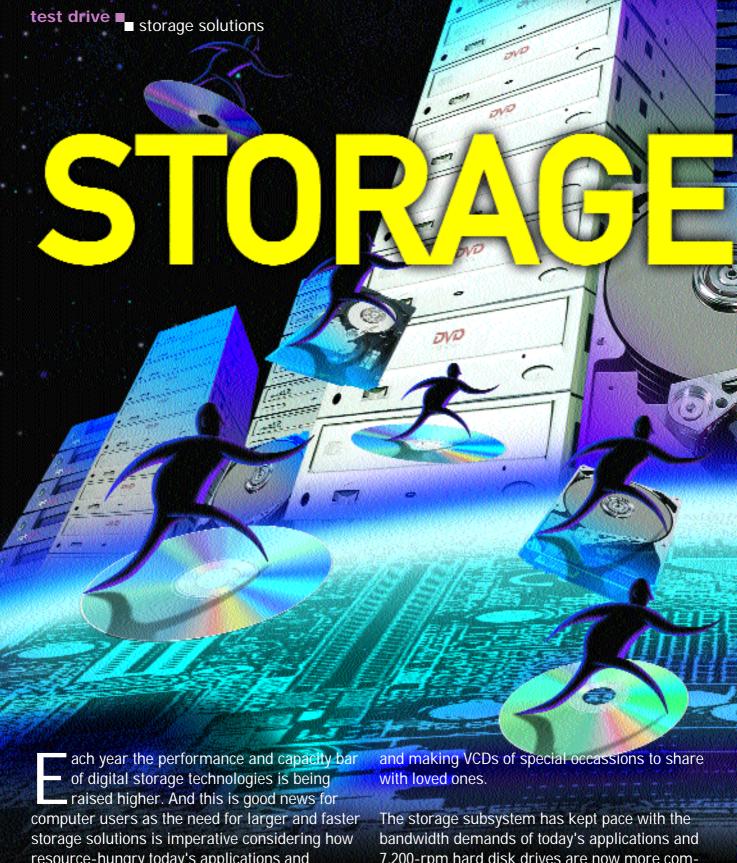
disks. This includes som the world's fastest DVD CD-RW drives, a 200 GI monster hard disk and a host of USB 2.0 complia external storage device: offering capacities rang from 250 MB to 60 GBI out which one is the be suited to your specific n and applications.

In the Bazaar section have the newest offering on the processor and merboard front with the speedy Athlon XP 2600 and the formidable MSI Ultra, featuring a host otechnologies such as Blutooth, AGP 8X and the ing KT 400 chipset for Athlon processors.

On the software fror we review SuSE 8.0 Prof sional—find out if it give you reason enough to verture into the world of Li We also bring you an expressive preview of the new version of one of the mean popular 3D rendering a cations, 3ds max Releas We delve into its enhancements and embellishme and give you the lowdo on whether it is worth upgrading to.

The 5-point Rating System used in Bazaar Excellent: a brilliant combination of price, performance and features—far beyond expectations Good: a good buy, better than most products in its category Average: reasonably competent but nothing spectacular about the product Mediocre: does not live up to expectations, needs improvement in many areas Poor: has serious drawbacks and needs improvement before it can be used for its target application

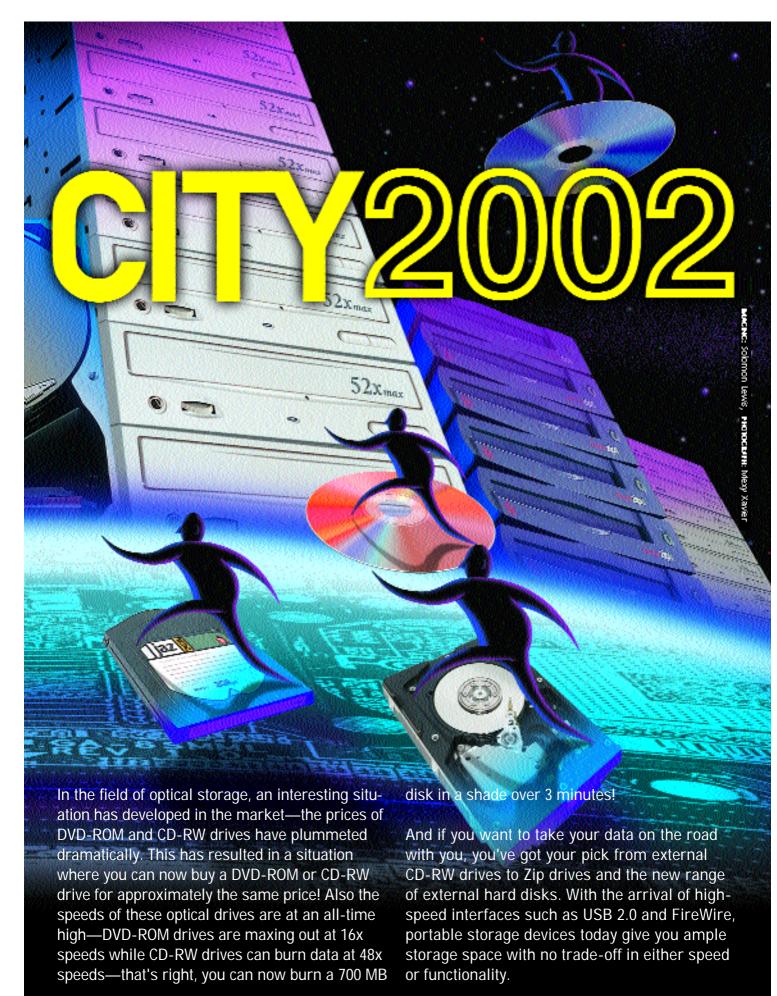
digit 42



resource-hungry today's applications and operating systems have become. Usage patterns have also changed rapidly, and the home PC is being used for data intensive tasks such as ripping entire CD collections as MP3 files

7,200-rpm hard disk drives are now more common than before. Fuelled by vast advancements in fabrication processes and interface technology, hard disk drives are currently pushing the limits with regards to affordability and storage capacity.

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■ digit 45 NOVEMBER 2002



oday, upgrading a hard drive has almost become a fashion statement—gone are the days when an 8 GB hard disk was considered sufficient. Everything from MP3 songs, DivX movies, 3D games, applications and even operating systems place tremendous demands on hard disk space. These days if you own anything below 20 GB you are sure to run into that roadblock of a 'disk full' message!

Along with just space requirements, there are increasing demands on the performance of drives as well. Multimedia applications (video and audio) place increasing demands on bandwidth. Besides, today's operating systems allow smoother and increased levels of multitasking, allowing you to work with several applications simultaneosly—and hard disks have to be able to keep up with loading and running these demanding applications efficiently.

In keeping with all this, there has been a tremendous increase in the performance and reliability of hard disks today. Buying a 7,200-rpm 80 GB drive now certanly makes a value proposition, whereas just recently most would have considered a 40 GB 5,400-rpm drive a great value buy.

Let's take a look at where things stand today. In this comparison, we compared the best of the crop of hard disks over two categories—let's see which ones turn out top dog.

Digit Test Process

The hard drives we categorised into two groups: those offering up to 60 GB of storage space and those with more than 60 GB capacity.

The test bed comprised a Pentium 4 running at 2.8 GHz on an Intel D850EMV2 board with 512 MB of RDRAM. The graphics card used was a GeForce 3 with 64 MB of DDR RAM and a 40 GB Seagate ATA/4 hard disk, which was installed on the primary IDE channel. All the test drives were connected to the secondary channel as a master. The necessary drivers, nVidia Detonator version 28.32 for the graphics card

and the Intel motherboard's INF Update version 4.00.1009 were loaded after installing Windows XP Professional as the operating system. The benchmarking utilities were loaded on to the drive and all drives were verified to be working in DMA mode before running the test.

Test methodology

We evaluated the hard disks for features (10 per cent weightage), performance (50 per cent), warranty and support (20 per cent) and value for money (20 per cent). These weightages formed the

basis for calculating the overall score for each product.

Features: As part of the overall scoring of the hard disks, we looked for different features of the drive such as the spindle speed, data buffer size, type of interface and rated access time. We also considered the documentation (manuals and quick start guides) and accessories such as data cables, mounting plates and screws.

Performance: We used the following benchmarks and applications to evaluate the performance of the hard disks:

HDTach 2.6: This is a synthetic test in which we recorded the read burst speed and CPU utilisation. Here, data is read from the disk and then written back to the disk. A graph is displayed as the data is read and written in real time. During this test, the program calculates the total CPU usage of the drive and the burst transfer rate of the drive under test. The burst transfer rate is a measure of the maximum possible bandwidth of the drive over its interface.

SiSoft Sandra 2002 Pro: This is also a synthetic benchmark. It evaluates the sequential and random read and write transfer rates and the access time of the disk. The benchmarking suite continuously writes and reads the data to and from the disk and measures these parameters using different data sets. We also recorded the SiSoft Sandra 2002 index, which is an aggregation of the per-

formance of the drive over these parameters.

Return to Castle Wolfenstein: This real world test is a good indicator of how a hard disk performs under heavy stress when running one of the newer and demanding games. We loaded the retail version of the game *Return to Castle Wolfenstein* from the test hard drive and noted down the time taken to load the first map.

Photoshop 7: We installed Photoshop 7 on the test hard drive and a 200 MB TIFF image was copied on to it. We first recorded the time taken for Photoshop 7 to load, which was part of the application load up

time test. The TIFF image was then opened from the test hard drive and the time taken for Photoshop 7 to open this file was recorded. This test is a good indicator of random and sequential read speeds using a real world application.

Warranty and support: Here we took into account the number of years of replacement warranty provided by the manufacturer and the extent of the service centre network.

Value for money: While buying any product, value for money

In 1956, IBM introduced the first storage system that could store a maximum of 5 MB of data and it featured disks with 24-inch diameters!

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Jargon Buster

Average seek time: The average time required for the drive heads to move from one track to any other

Burst transfer rate: The maximum speed at which the data is transferred to and from the memory.

ESD (Electro Static Discharge): This usually occurs if you pass static to the drive by handling it without grounding yourself. The chips inside are sensitive and the damage caused could be permanent.

G: This is a shock specification for hard drives. When drives experience more shock than specified, they are prone to suffer damage.

Head: This is the part of the drive which can write, read, erase, record or play back data on a magnetic media. Internal transfer rate: The speed at which the drive can transfer data from the platter to the heads and vice-versa. Latency (Rotational): The average time taken for a disk to rotate to a desired sector.

MTBF (Mean Time Between Failures): It specifies the reliability of the drive. The higher the MTBF rating, the more reliable

Sustained transfer rate: The speed at which data can be transferred for a sustained period of time.

plays a very important part. Therefore we calculated the value for hard drives by determining the sum of performance and features divided by the price.

How they fared

There has been a tremendous increase in the performance and reliability in hard disks today and this has given rise to a new level of functionality and usability in computers-video and audio are applications that would run on any computer today and the price per megabyte rating is forever spirally downward. Let's take a look at how the current generation of hard disks perform across different criteria.

Features

Most hard disks include adequate protection against shock and damage during transportation and installation.

All the Samsung drives came in a shell plastic cover and included a small single-page manual for jumper identification and installation. These drives also sport

> features such as ImpacGuard and SSB. ImpacGuard protects the disk from external vibrations, thus enhancing its internal resistance to shocks.

> > reduces impact of external shocks with the help of a well-designed

The drives from Maxtor came in Samsung drives incorporate techa box with plenty of protecting foam to shield the drive during nologies to shield them from internal and external shocks transportation. The 5400-rpm

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How Much Space is Enough?

Depending on your computing needs, users can be classified into the following types:

Less is good...

...if your time on the PC is spent surfing the Internet and maybe create a spreadsheet or two. A hard disk with the bare minimum capacity should be enough for you. The same holds true for businesses where the PC is primarily used for accounting and billing purposes, or for creating letters and spreadsheets. A 20 GB drive should suffice your needs, though 20 GB drives are fast phasing out. Preferably, go for a 40 GB hard disk—this is fast emerging as an entry-level solution. Given your frugal need for space, a 40 GB hard disk will last you several years.

Size does matter...

...if you're a typical home user who stores the latest applications, MP3s, videos, movie trailers and even full-length movies, not to mention space-hogging games. No amount of space is ever going to satisfy you. Go for at least 60 GB of space. If you feel you might exceed that as well, then 80 GB might be more appropriate. Space also matters if you use CAD\CAM software, or are a graphics professional with a penchant for 3-D animations.

Speed is your mantra...

...if you are a power user, but lack the purchasing power to buy a SCSI drive. Consider the 7200-rpm drives—the capacity you can get would depend on how much you can afford, but an 80 GB drive should suit you just fine.

drives from Seagate came with a leather cover to protect the drive electronics and the sensitive internal chips. The 7200-rpm drives from Seagate too came with a screwed on back cover to protect the drive electronics. Seagate calls this feature Seashell and it is of great help in protecting the drives during the installation and transportation process, especially from static discharge. There were no manuals accompanying the Seagate drives.

The Samsung SpinPoint drives use proprietary features such as NoiseGaurd and claims to run at 3-decibel noise levels. Indeed, these drives were exceptionally quiet during the tests—a certain advantage if you work at night or in an environment where any small noise can be disturbing.

As far as design goes—a factor that many users are not too bothered with—all Samsung drives had the same design. The only confusing part with Samsung drives was the jumper setting—two jumpers are required for setting the drive as master and some users might find this confusing.

These general features aside, we also evaluated the drive specifications and bundled accessories. **Up to 60 GB capacity:** Capacity is one of the major parameters on which a hard disk is bought today.

The decision to buy a higher capacity drive is based solely on what you are going to use it for. Judging by the current trend, 20 GB drives will soon be phased out, as bigger drives get more affordable. Even if you don't require too much disk space, it would be wiser to go in for at least a 40 GB drive—it costs just

marginally more than a 20 GB drive. A 40 GB drive is a good starting point as it provides sufficient space for holding games, general applications and even media files for home and non-demanding office uses. But if you store huge amounts of data, you need at least 60 GB.

Surprisingly, we received just one 60 GB drive in this comparison—the 5,400-rpm Samsung SV0602H. Other than this there were three 20 GB drives and four 40 GB drives. The Samsung SV0602H is priced just Rs 300 more than the SV4002H, the 40 GB drive of the same spindle speed from Samsung, though it was in the middle of the pack in terms of performance.

The 20 GB drive from Maxtor, the 541DX, was the sleekest drive in this comparison, but it was also the noisiest.

If you are looking for something smaller and lighter on the pocket, then the Samsung SV2001H is a good deal. This 20 GB drive is available for less than Rs 3,800, though the catch is that its performance is not quite up to the mark.

The Samsung SP2001H, however, hits the sweet spot in this category—this 7,200-rpm drive offers 20 GB space but showed an impressive performance, and will please those in search of performance and good price rather than capacity.

All the drives featured a 2 MB data buffer and they all sported a single-platter design with an ATA/100 interface. None of the drives in this category included accessories.

Over 60 GB capacity: For gamers and MP3 addicts, a drive that has less than 60 GB storage could prove to be restrictive, especially if you are forever downloading songs and movies—a single DivX rip can take up 700 MB.

Since most games released today consume at least half a GB of hard disk space, you need as much space as you can get if you want the 'I-have-the-most-number-of-games-installed' boasting rights. And, of course, if you are into graphics or video editing, you know you need as large a hard disk as possible.

We received 10 drives that offered storage capacity in excess of 60 GB. Here, too, all the drives featured a 2 MB data buffer. However, there was a wide variation in the number of platters used to implement these drives—they ranged from the two-platter design of the IBM 82.3 GB drive to a four-platter design sported by the Maxtor 160 GB drive. Interestingly, all the Western Digital drives were based on an unusual three-

platter design.

The Maxtor drives come with mounting plates and screws. Also provided is Maxtor's proprietary disk management software called Max-Blast, which allows you to manage your drives, partitions and prepare them for loading the operating system during installation.

The Samsung and Maxtor drives also feature installation documentation, unlike any of the other drives in this category.

At 200 GB, the WD2000 from Western Digital was the largest drive. Another mammoth was the 160 GB drive from Maxtor. This was also the only drive that featured the new ATA/133 drive interface—all the others in this comparison were based on

the ATA/100 interface

The 200 GB Western Digital WD2000 delivered excellent performance and is a great buy for the user who demands mindblowing performance coupled with oodles of storage space. However, this drive tended to run really hot—it would be a good

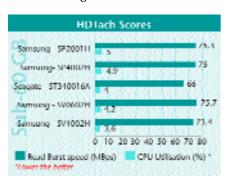
The total amount of storage space of the hard disks we tested in this comparison amounted to 1.3423 Terabytes—enough to store about 312 full-length DVD movies with Dolby Digital sound!

idea to ensure that the cabinet you use this drive in has good cooling and airflow.

Performance

We tested the drives for their performance using synthetic benchmarks as well as for their real-world performance characteristics. We used the traditional drive benchmarking tools and software for obtaining a drive's raw speed in terms of data transfers and access time. The access time was logged using real world applications such as *Return to Castle Wolfestein* and Photoshop 7.0. The overall score was based on a weighted average of these two sets of scores.

HDTach 2.6: This is a synthetic test which records the read burst speed and CPU utilisation. The program calculates the total CPU usage of the drive and the burst transfer rate, which



is a measure of the maximum possible bandwidth of the drive over its interface.

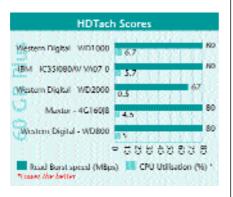
Up to 60 GB capacity: The read burst speed is a measure of the maximum transfer rate that the drive can support over its interface and is there-

fore directly related to the IDE interface the drive is using, coupled with its spindle speed. Six of the eight drives managed to hit read burst scores of above 70 MBps. However, both the 40 GB drives from Seagate (the ST340016A and the ST340810A) couldn't make it past this level. The one drive that really shone in this test was the Maxtor 541DX—it was the only drive in this category to log a data transfer rate of 80 MBps.

At 3.1 per cent, the CPU utilisation of the Maxtor 541DX was the second lowest in this category—the drive with the lowest CPU utilisation was the 40 GB Seagate ST340810A drive with a score of 2.7 per cent. The low CPU utilisation of both these drives makes them suited to applications where you would multitask many applications on your PC such as downloading applications over your broadband connection while watching a DivX movie off your hard disk. This also implies that these drives can be used in older computers with slower processors. As they do not strain the processor much, they would give a smoother operation. The drive that took a

beating here was the Samsung SP2001H—it logged a CPU utilitsation of 5 per cent.

Over 60 GB capacity: In this category, the lone IBM drive, both the Maxtor drives, and two of the three Western Digital WD1000 and WD800 showed an



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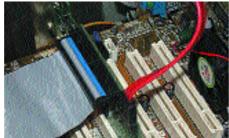
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Serial ATA: Hit or Miss?

With the upcoming ATA/133 standard pushing the limits of the maximum transfer rates supported by the parallel ATA interface, the next step to revolutionise hard disk interfaces will be Serial ATA. It offers greater speed, easier fabrication and application.

The Serial ATA interface is to ATA what FireWire is to SCSI—the entire approach is to convert the parallel standard that is used by the existing ATA interfaces to a serial format (where one bit is transferred at a time) so that higher

data transfer frequencies can be supported. Also, this approach greatly simplifies the fabrication of cables and connecting wires that are used by the interface since there are fewer signals to deal with, facilitating a less cluttered cabinet. This translates into easier airflow within the system and subsequently, more efficient cooling. In fact, Serial ATA uses just four signal pins (there are a total of seven pins; the others are used for transmitting overhead commands) that actually carry the data and include the power and



Conventional IDE cables vs Serial ATA: notice the difference (flat vs rounded)

ground pins—significantly lesser than the 80 lines that are used in today's ATA/100 and ATA/133 cables.

This standard will support transfer rates of up to 1.5 Gigabits per second, which translates into about 150 MBps. Also, since this is a point-to-point protocol, there will be no place for master and slave devices on a single cable and therefore, bandwidth will not need to be shared between devices. Another very big advantage with this standard is that it is backward compatible with the existing parallel ATA standard at the

driver level. Therefore, all existing applications in which the parallel ATA standard is used can be fully extended to support Serial ATA.

Specifications: 150 MBps maximum transfer rate (300/600 MBps envisioned for the future), hot-plugging capability, two power saving modes: partial and slumber, overlapping (commands), tagged command queuing, seven-wire data cable, connectors measure just 8 mm wide.

excellent read burst speed of 80 MBps, which is the highest speed a drive can achieve across an ATA/100 interface. The drive that really disappointed here was the 80 GB Seagate ST380021A. It scored a very paltry 56.7 MBps in this test. This was surprising considering the fact that this drive sported a 7,200-rpm spindle speed.

In the CPU utilisation test, the drive that broke barriers was Western Digital's 200 GB monster (the WD2000), which logged a stunning 0.5 per cent of CPU utilisation. The Maxtor 80 GB drive also scored over the other drives in this category with a good CPU utilisation score of 3.7 per cent. If you use space consuming and CPU-intensive applications such as Photoshop or AutoCAD, the drives with least CPU utilisation should be your pick, especially when you are running these applications together and would be transferring data between them.

SiSoft Sandra 2002 Pro: This is a synthetic benchmark that evaluates the sequential and random read and write transfer rates and the access time of the disk.

Up to 60 GB capacity: In the SiSoft Sandra 2002 Pro sequential read speed test, the 5,400-rpm drive that took the lead was the 60 GB Samsung SV0602H. It logged a very respectable score of 38 MBps. The highest scores in this test for the 7,200-rpm drives was a tie between the two Samsung hard disks, the

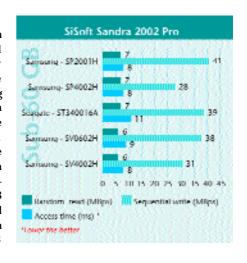
SP2001H and the SP4002H, both scoring 41 MBps.

In the random read tests, the performance variations were not that wide. The scores ranged between 5 MBps and 7 MBps—in practical terms, the speed advantage offered by the upper value of this variation is insignificant.

Over to the write tests. When dealing with sequential data, the drive that did well in the 5,400-rpm range was the Samsung SV0602H with a very respectable score of 38 MBps. The 20 GB Maxtor 541DX managed to rake up a score of just 12 MBps for

sequential writes.

The 7,200-rpm drive that did well in this category was once again the Samsung SP2001H, with a very respectable score of 41 MBps. Surprisingly, the other 7,200-rpm entry from Samsung, the 40 GB SP4002H, trailed in this test with a score of just 28 MBps.



In the random write test, there was a reasonably large variation in score with the 40 GB Seagate ST340810A logging a very respectable 7 MBps in spite of being a 5,400-rpm drive. The drive that did badly here was again the 20 GB Maxtor 541DX with a score of just 3.1 MBps.

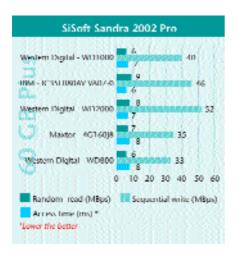
The access time determines the speed with which the drive can locate the date you need, especially if it is scattered all over the hard disk. The fastest access time was logged by four of the five Samsung drives—the SP2001H, SP4002H, SV2001H and SV4002H each logged a respectable 8 ms, while the Samsung SV0602H logged 9 ms. The drives that fared particularly poorly in this test was the 20 GB Maxtor 541DX and the Seagate ST340016A—both logged 11 ms.

Over 60 GB capacity: The fastest hard disk in the sequential read test was the Western Digital

disk drive today
can be completely
assembled from its
components in
about 11 seconds—
the entire process
is, naturally, automated

Tips to Keep your Drive Shipshape

- Protect the drive from shocks and jerks.
- Always handle the drive by its side. Never touch the underside of the drive or the drive electronics.
- When installing the hard drive, take care to screw it firmly to the chassis of the computer so as to protect the drive from vibrations when using the PC. The maximum damage that a drive suffers is usually due to improper handling during installation. Also take care to use the screws that come with the hard drive so that they match the bore size on the drive.
- Never try to open a hard disk if it fails to respond. Even a particle of dust entering the insides of the drive can destroy the platter on the disk.
- Enable S.M.A.R.T. from the BIOS. This slows the drive down, but the difference is hardly noticeable for most applications—between 2 to 5 per cent. S.M.A.R.T. is a technology that warns you when there is a problem and the drive is about to fail.



WD2000. It logged 54 MBps—one of the fastest scores we've ever logged for a 7,200-rpm drive. The drive that performed poorly here was the Western Digital WD800. It logged just 33 MBps-a tad slow for a 7,200rpm drive. The 5,400-rpm drive that did well in the sequential read test was the Samsung

SV1204H, with a score of 38 MBps.

The 82.3 GB IBM drive logged the fastest random read score of 9 MBps. The two drives that didn't do well in this test were the 80 GB Western Digital WD800 and the 100 GB Western Digital WD1000. Both these 7,200-rpm drives logged just 6 MBps.

In the sequential write tests, the formidable 200 GB Western Digital WD 2000 logged 52 MBps—the highest we have ever seen in an IDE hard disk drive. The 82.3 GB IBM drive also did well with a score of 46 MBps. Lagging in this test was the 80 GB Western Digital WD800, with a score of just 33 MBps.

The drive that exhibited a very good random write score was the 100 GB Western Digital WD1000 with a score of 14 MBps. Lagging here was the 80 GB Samsung SP8004H with a score of just 7 MBps. In the 5,400 range, the drive that did well was the 160 GB Maxtor drive with a score of 11 MBps while the two that trailed in this test were the 5,400-rpm 80 GB and 120 GB drives from Samsung, both logging just 5 MBps.

As for the access time test, the IBM drive delivered a stellar score of 6 ms, while the 120 GB 5,400-rpm Samsung drive lagged with a score of 10 ms.

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Return to Castle Wolfenstein: We loaded the game on the test hard drive and logged the time taken to load the first map. This test therefore provided a real world indication of the hard disk's performance when running gaming applications.

Here surprisingly there wasn't much of a difference in the performance of the drives. Almost all of the drives took approximately the same time (15 to 16 seconds) to load the game's first map. This was seen in both the categories of the hard disk drives and across spindle speeds and capacities.

Photoshop 7: In this test we recorded the time taken for Photoshop 7 to load, after

which a 200 MB TIFF image was opened from the test hard drive and the time taken for Photoshop 7 to open this file was recorded.

-	hotoshop 7 Imag	c some rese (see)
West	em Digital W01000	13
2	Sentang - SP8004H	14
EM	IC35L080/W/W07 0	16
2	Namoung - W1 204H	17
2	Sampung - SY8004H	II.

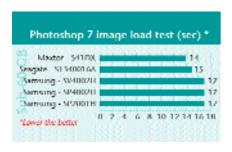
Up to 60 GB capacity: All the drives in this category took between 10 to 11 seconds for loading Photoshop. Surprisingly, the drive that managed to open the 200 MB test TIFF file in the minimum time was the 5400-

rpm, 20 GB Maxtor 541DX. It executed the test in 14 seconds, which was almost as fast as the best performer in this test in the 60 GB plus category! All other 5400-rpm drives took around 18 seconds to open the file.

Samsung's SV2001H, a 20 GB drive running at 5400-rpm, was the slowest, taking a sluggish 35 seconds to open the 200 MB TIFF image—a consequence of its low sequential read speed. Seagate's 40 GB 5,400-rpm drive (the ST340810A) took 25 seconds to open the image.

Among the 7200-rpm drives Seagate's 40 GB 7,200-rpm ST340016A took 15 seconds whereas, Samsung's drives took around 17 seconds to load the test image.

Over 60 GB capacity: In this category, once again the 100 GB



Western Digital WD1000 and the 80 GB Western Digital WD800 logged a really fast time of just 8 seconds for firing up Photoshop 7, while the drive that really struggled to load this application was the Samsung

SP8004H—this 80 GB 7,200-rpm drive took 17 seconds.

The 100 GB Western Digital WD1000 was able to open the 200 MB TIFF file in just 13 seconds, while the Seagate 80 GB 7200-rpm drive took the longest (25 seconds) to open it. The 160 GB drive from Maxtor was a decent performer in the synthetic tests and therefore logged the best application load time which can be attributed to the excellent read burst speed of the drive.

Decision Maker				
	General computing	Professional applications	Entertainment and gaming	
You need	To surf the Internet and	To work with applica-	To download MP3s and	
	perform basic tasks such	tions such as Photo-	DivX films and install	
	as working with a word	shop, CAD/CAM soft-	games, as well as be	
	processor and spread-	ware, 3D animation	able to play these with-	
	sheets	tools	out hindrance	
Look for	A 20 GB or 40 GB,	The largest drive you	A 60 GB plus drive run-	
	5,400-rpm drive	can find, running at	ning at 5,400 rpm or	
		7,200 rpm	7,200 rpm	
Our pick	Samsung SP2001H 20	Western Digital 100GB	Samsung SV0602H or	
	GB or Maxtor 541DX	or 200 GB drive	Seagate ST340016A	
Price	Rs 3,750 to Rs 4,500	Rs 10,000 and above	Rs 3,750 to Rs 5,800	
range				

What it all leads to

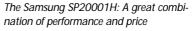
Many tests and MBps later, we were left with a set of drives, some of which astounded us with their performance, while others offered value on account of their affordable price. Let's take a look at the winners and see what gave them the edge over the others in the pack.

Up to 60 GB capacity: The Best Performance Award in this category is taken by the Samsung SP2001H. Though it offers only 20 GB space, it posted impressive scores in the synthetic tests and was on target in the real world tests

too. It achieved the highest drive index in the SiSoft Sandra test and makes a great buy if you require a speedy drive and do not require too much hard disk space.

Guard, which ensures low noise levels while running, and technologies such as ImpacGuard and SSB that aim to protect the drive from vibrations.

The SP2001H also sports impres-



The Best Value Award was also bagged by the Samsung SP2001H. This drive makes a great

buy users looking for a multimedia system and who don't require high disk space. What makes this drive an excellent buy for the 'low is better' user is that it's priced just Rs 250 more than its 5,400-rpm counterpart.

Over 60 GB capacity: The Western Digital WD1000 is undoubtedly our pick for the Best Performance Award in the 60 GB plus category. This drive is your best option if you require a speedy and high capacity hard drive. With 100 GB of space and 7200-rpm rotational speed, the drive packs enough punch to



Western Digital WD1000: High capacity and speed

Things to Consider Before you Buy

- Speed or space? If you need to store MP3s and DivX films, or to back up heavy image files, buy the largest hard disk you can afford. On the other hand, if you extensively use applications such as image editing or audio processing software, look for the fastest hard disk you can afford—at least a 7,200-rpm drive—and buy the largest in that speed range.
- Research the market. Ask your friends or dealers you know, or search the Internet for information about the manufacturer, the reputation they enjoy and their after sales-service.
- Check the warranty. Apart from the time frame covered, also check the type of warranty. Some manufacturers will replace the hard disk only in the first year, after which they will only repair it. This is rather unreliable and can lead to more problems in the future.
- Confirm the time it takes to replace a faulty hard disk. This is especially important if your business relies heavily on data storage. Generally, manufacturers who run a service centre are able to provide quick replacements, while those who don't have service centres could take weeks to replace a faulty hard disk.
- Check for accessories such as IDE cables, disk management software and operating manuals.

keep power users happy. It performed exceptionally well in our synthetic and real world tests. In the read burst speed (HDTach) test, it hit a high score of 80 MBps. It also performed well in the application load time test, completing the test the quickest among this group of drives. If your time on the computer is spent in storing huge files and if you work with bandwidth-hungry applications such as Photoshop and 3DStudio Max, this drive will answer your needs.

The Maxtor D540X-4K is our Best Value Award winner with its good performance, features and competitive price. This 5400-rpm drive offers an impressive 80 GB storage space.

Though its performance was rather average (which is attributed to its 5,400-rpm rotational speed),

its price gives it the edge.

This drive provides a disk management software called Max-Blast and the package includes mounting plates, screws, data cables, a manual and a quick start guide. It is a good choice if you require a large capacity

The Maxtor D540X-4K: Lots of storage at a great value

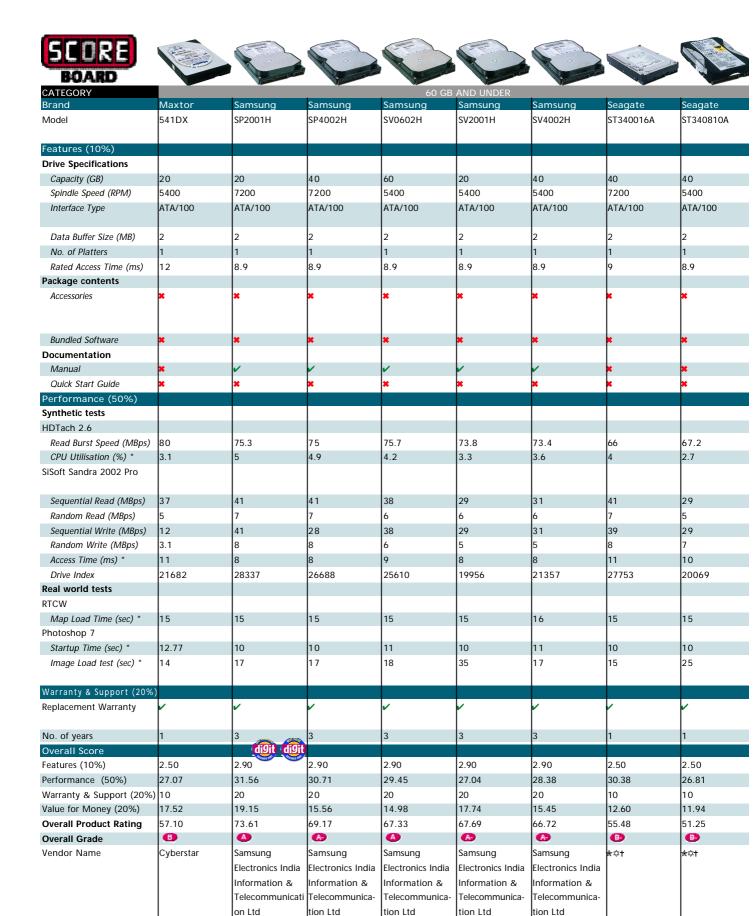
drive without a very high level of performance.

We have yet again seen an iteration in hard disk drives over the past year. 40 GB drives are now entry level and performance is increasing with 7,200-rpm drives fast becoming the *de facto* standard. This, coupled with falling prices, will ensure that we have drives that will let us power the next generation of applications, operating systems and games, while not pinching the pocket.

YATISH SUVARNA and MARCO D'SOUZA

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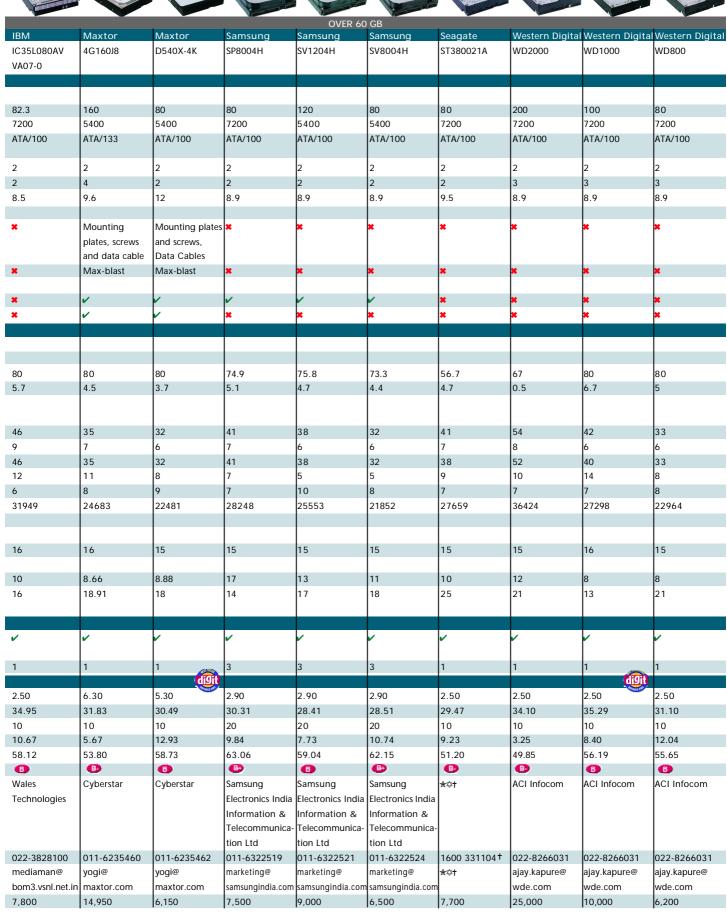
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^{*} Lower the better

[†] Since Seagate India has a liason office, all inquiries are entertained through a toli



free number

Drive-in Bytes Falling prices and enhanced functionality, be it for watching DVD movies or

Falling prices and enhanced functionality, be it for watching DVD movies or burning CDs, have made CD-Writers and DVD-ROM drives a smarter buying decision as compared to an ordinary CD-ROM drive

he digital age has brought with it the need to store vast amounts of data, which has in turn created a market that witnesses the spawning of bigger and faster storage devices with alarming regularity. The humble floppy drive is as good as extinct, and the CD-ROM is treading on similar grounds, with faster and more feature-rich CD-Writers and DVD-ROMs all set to dominate the food chain. CD-Writers, for example, have reached a stage where they can burn 700 MB of data in less than three minutes, while DVDs not only promise an end to multiple-CD games and applications (and the irritant of 'disk-swapping' that invariably follows), but also bring with them the wonderful world of DVD movies—the concept of the home theatre was never a more likely proposition. Of course, all of this would mean little if the devices in question weren't accessible to us mortals. The good news is that thanks to a very competitive market and a demanding consumer, both CD-Writers and DVD-ROM drives are well within the bounds of even the most meagre of budgets. Buoyant with this knowledge, join us as we evaluate 11 CD-Writers and seven DVD-ROM drive. Which one will you take home to mom?

Digit Test Process

The qualifying criterion for the CD-Writers was that they should be able to burn a CD-R at 32x speed or above. For the DVD-ROM drives, this was 12x and above.

The CD-Writers and DVD-ROM drives were tested on an Intel Pentium 4 2 GHz PC with 256 MB DDR-RAM and a 40 GB ATA/100 7,200-rpm hard drive with Windows XP Professional as the OS. The drives in test were connected as secondary master. The CD-Writers and DVD-ROM drives were tested with DMA enabled for all IDE channels.

The CD-Writers under test were benchmarked for their performance in reading information off a CD and in writing different forms of data on to a CD-R and rewriteable CD (CD-RW). The media used was Princo CD-R 700 MB, capable of writing at 48x. The media used for the re-write and erase test was 16x 700 MB ASUS CD-RW.

Test methodology

The drives were tested on four primary parameters: features (20 per cent weightage), performance (50 per cent weightage), value for money (20 per cent weightage) and warranty and support (10 per cent weightage).

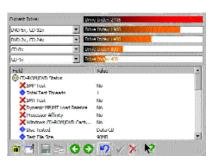
Features: We checked for the buffer size, buffer underrun technology used by the CD-Writer, robustness of the CD tray, support for 8 cm CDs and whether the drive could be used vertically. We

also took into account the bundled software the nature and quality of the manuals and other package contents such as audio cable, IDE cable, software CDs and the number of blank CD-R and CD-Writer media provided. For DVD-ROM drives, we looked for the data buffer size, presence of audio and IDE cables and the quality of the documentation and software included.

Performance: We looked at the writing, rewriting and reading performance of the CD-Writers. Here the scores that reflect the core performance of the Writer are the ones in the writing and rewriting tests. For the DVD-ROM drives, we evaluated the performance in terms of read speed and access time.

CD-Writers: We tested for ISO write speed by burning an ISO image created using Nero on the CD-R. Assorted data was written on a CD-R and a CD-RW using Nero 5.5.9.0. An Audio CD was created by burning WAV files on a CD-R. Our test CD was

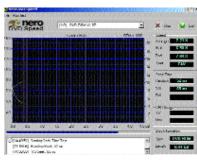
cloned using CloneCD 4.0 and we noted the time taken for this process. We also tested the time taken to erase the CD-RW. All tests were performed at the maximum speed supported. We checked whether the drive performed the operations successfully without errors during the writing process. Our read speed tests comprised



SiSoft Sandra helps in determining the theoretical sequential speeds that a drive can achieve

the Nero CDSpeed v 1.0 test, which showed the average read speed of the CD-Writer. We also conducted assorted read tests where a combination of files ranging from 1 KB to 100 MB were read using the CD-Writer and copied to the hard disk—we noted

the time taken for this entire process. The Writers were also benchmarked for sequential read, random read and average access time using SiSoft Sandra 2002 Pro. The disk registration time (time taken by the drive to display the label in the Explorer) was also noted.



Nero DVDSpeed is a great tool to check DVD drive speeds

test drive ■ storage solutions

DVD-ROM Drives: We used Nero DVDSpeed which showed the seek time, CPU utilisation spin down time and the drive speed of the DVD-ROM drives. The VOB file extraction test was carried out using the software Flask MPEG and the time taken for this was logged. We also used SiSoft Sandra 2002 Pro for checking the DVD-ROM drive's sequential read, random read and average access time. The time taken for extracting the first, middle and last track from an Audio CD was noted using the software Exact Audio Copy. An assorted read test was carried out where a combination of file sizes ranging from 1 KB to 100 MB were read from the CD-RW and copied to the hard disk and the time was noted. The disk registration time (the time taken by the drive to be recognised by the OS) was also noted.

Warranty and support: We logged the period of warranty for the CD-Writer and DVD-ROM drives. We also noted the type of support provided by the different brands. Some have a policy of replacing the faulty drive within the warranty period, while others only repair the drive.

Value for money: Here we calculated the features and performance delivered and at what cost. The best drive is that which is not very expensive and at the same time delivers impressive performance and has a host of features.

Test Analysis

There's a wide range of optical drives available in the market today. A DVD-ROM drive serves the purpose if you basically need an optical drive that will allow you to watch movies and don't need to back up data. A CD-Writer on the other hand, is what you should be looking at if you wish to archive and swap data.

Judging by the devices in this comparison test, all DVD-ROM drives have low CPU utilisation while dumping data form a DVD to the hard disk. If you wish to compress a DVD movie into the DivX format, the VOB extraction test will give you a good indication of a drive's performance while doing so. A drive with a low CPU utilisation score and a low VOB file extraction score will thus be the best for converting those DVD movies into the DivX format. We also found that the data seek times for DVD-ROM drives are now on par with those of CD-ROM drives.

If you plan to back up a lot of data using your CD-Writer, the test that you should especially consider is the Assorted Write Speed test, since the data that you are most likely to archive will consist of small individual files and folders. Additionally, the CD-RW is fast emerging as a replacement for the floppies and Zip disks; it is now the *de facto* means of swapping data with your friends or colleagues. The performance of the Writers under the RW-Assorted Write Speed test will give you a good idea of their capability to copy data onto a CD-RW.

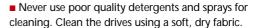
CD-Writers

digit 58

A CD-Writer works out to be an ideal backup solution since media is readily and cheaply available. A CD-ROM drive with 24x speed is now ubiquitous; moreover it is also capable of reading a CD-RW medium. Thus, if you have a CD-Writer and use a CD-RW to back up or swap data, you can rest assured that you will be able access the same on almost any PC.

Writers now offer burning speeds ranging from 32x to 48x, which means that the time taken to back up essential data is drastically reduced from 20 minutes to under 4 minutes.

Taking Care of Your Optical Drive



- Keep the tray clean. Use a duster for thorough cleaning.
- Use a UPS (Uninterrupted Power Supply) for your computer and the Writer. This will protect your system from any surge or dip in power.
- Do not push the tray to close it; always use the eject button instead.
- Never try to force the tray out, if it doesn't eject automatically. Use the pin provided with the drive to manually remove the tray.
- Use a good quality lens cleaner to keep the lens clean, as this is one of the most important parts of the drive.

Features

The CD-Writers we received fell in the 32x to 48x speed bracket. The ASUS CRW-4816A, Iomega CDRW5529INT-B and LITEON LTR-48125 W offered the capability to burn a CD at 48x. While the models from LG and Krypton ran at 32x speed, which is the entry level for CD-Writers today, five of the entries offered a write speed of 40x—these were the Benq 4012P, Krypton BCE-4012M, LITEON LTR-40125 S, Samsung SW204, and Sony CRX-195A1. The Yamaha CRW-F1 offered a rather un-conventional speed of 44x

All the CD-Writers supported burn proof technology and we experienced no errors while writing CDs at the maximum supported speed. It basically ensures that data is fed to the CD-Writing application in a constant stream as an interruption in data flow during the writing process can cause errors.

Also important for error-free CDs is the buffer size—higher the amount of buffer, lower the chances of ending up with a coaster. The buffer is the memory on the CD-Writer. It temporarily stores the data it receives from the hard drive or CD before it is passed on to the writing head. This ensures that the Writer is constantly supplied with the data to burn on the media. The LG 8320B, Yamaha CRW-F1 and Samsung SW204 were the only Writers to have an 8 MB buffer; the rest had a 2 MB buffer.

All the CD-Writers had adequate front panel indicators, but the noteworthy ones were the ASUS CRW-4816A and the Krypton BCE-3212M—both had an extra Play/Forward button whereas the other Writers only had the Eject/Stop button. The CD-Writers from LITEON had two LED indicators, one each for Read and Write.

Any device that has moving components needs to have especially good build quality, else it will soon develop mechanical snags regardless of how feature-rich and good the device is otherwise. Most of the CD-Writers had a decent build quality, except for the Yamaha CRW-F1—its tray was a little loose. The tray of the Samsung SW204 had a good build quality.

If a CD-Writer can be placed vertically, it gives you more flexibility if desktop space is a matter of concern for you. Although it is not advisable to keep a CD-Writer in the vertical position while burning data, it's all right if the drive is being used as a CD-ROM reader. Though all the CD-Writers could be used vertically, only the Yamaha CRW-F1 had a locking mechanism to hold the media in this position. However, when testing this feature on

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Easy Steps to Burn a Perfect CD

- Turn the screensaver off while burning a CD so as to not hamper the flow of data to the CD-Writer.
- Defragment the hard disk before burning a CD.
- If you have a fast Writer but a slow processor and hard disk subsystem (ATA 33), it is safer to burn the CD at a speed lower than the maximum possible.
- Use Track At Once instead of Disk At Once to burn an Audio CD. This will make the Audio CD look more professional because a 2 second gap will be inserted between each burned track and the CD can then be mass produced error-free.
- Always 'finalise' a burned Audio CD to ensure that it plays on your home music system.
- Use branded CDs for burning critical data—cheaper media are prone to damage and can't hold data for long. Plus there is no guarantee that they will burn everything perfectly.
- Shut down all other applications while burning CDs; do not use the computer for any other tasks while a CD is burning.
- Try to simulate a burn process if the Writer has just presented you with a coaster. Most CD-Writing software will allow this.

the Yamaha writer, the tray came out without the CD, which forced us to keep the drive flat on its back to get the media out. This can be harmful for the media as well as the Writer if repeated frequently.

The accessories included in the package add to the overall value of the product. If the package includes the connecting cables, a variety of blank media and a good mix of software, it saves you the expense and bother of buying these separately.

The best combination of accessories was provided by the Samsung SW204—the package included the audio and IDE cables, one blank CD-R disk and one CD-RW disk, Nero 5.5.7.8 and InCD 3.0, and a manual. The ASUS CRW-4816A also comes with the audio and IDE cables, a blank CD-R and CD-RW disk, Nero 5.5.8.0 and a manual. Sony's CRX-195A1 was meagre on accessories—it included only Nero 5.5.8.3 and InCD 3.12.0.

Performance

The proof of a CD-Writer is in its performance. Hence, we tested the speed and reliability with which the CD-Writers could burn CDs, read data off CDs and rewrite data on CD-RWs.

Write tests (CD-R): Though a CD-Writer can double up as a CD-ROM drive, the main function obviously is to burn CDs. Hence we tested this through various tests and benchmarks. ISO Write Speed: If you need a CD-Writer to back up large chunks of data, such as 200 MB TIFF files, texture files or animation files, then its performance in burning sequential data is what you should look at. To test the sequential data-burning capacity, we used a 700 MB ISO file. This was burnt onto a CD using Nero 5.5.9.14, at the highest speed supported by the CD-Writer. We were expecting the 48x writers to bag this test-the medium after all was a perfect match for their class and the data was of a sequential nature—but nothing of this sort happened. The slower 40x Sony CRX-195A1 surpassed all others here, taking just 152.56 seconds to burn the ISO image. In fact, the runner-up in test was also a 40x Writer, the LITEON LTR-40125 S. It took just 2 seconds more to burn this data, which in practical terms doesn't make it slower. Krypton BCE-3212M (32x) and Krypton BCE-4012M (40x) burned the ISO image at a really slow 261.44 and 255.61 seconds, respectively.

Assorted Write Speed: To test performance in writing non-sequential data, we burnt a folder containing files ranging from 1 KB to 100 MB onto a blank CD, at the highest speed supported. Here, as expected, the fastest times were logged by the 48x drives. The CD-Writer from Iomega was the fastest, taking just 181.19 seconds to burn the 700 MB file. Close on its heels was ASUS CRW-4816A, taking an insignificant 3 seconds more.

The slowest here was again the Krypton BCE-3212M, taking 343.76 seconds to finish the test—this makes it almost twice as slow as the fastest drive. Iomega is the best buy for those who take a lot of backups on CD-Rs and require a faster drive which can do the task in minimum time.

Audio Write Speed: We tested the speed with which the CD-Writers could write audio on a CD by burning an 80-minute Audio CD from WAV files. Here again the Iomega logged the

fastest time by burning the Audio CD in 181.57 seconds—this time is practically the same as the 181.19 seconds it took to burn the assorted (non-sequential) data, which indicates that this drive will give consistent results for different types of data.



Sony's CRX-

195A1 took just 3 seconds more to finish writing the Audio CD. The Krypton writers performed poorly in this test as well. The 32x Krypton drive took 340.16 seconds, while its faster sibling, the 40x writer, took 464.96 seconds.

Raw Write Speed: For the Raw write speed test, we attached an extra 48x CD-ROM as the primary master. Using CloneCD, we then created an exact replica of the Digit Test CD. We expected the Writers to take longer here, since the data was being read from a CD-ROM drive, but the Writers did just fine and didn't log any extra time here. The Iomega Writer once again logged an impressive time of 182.89 seconds to finish cloning the CD. The ASUS CRW-4816A was once again a close second, taking just 185.05 seconds. The slowest drive here was again the Krypton BCE-4012M; it took 336.57 seconds.

Rewrite tests (CD-RW): We also evaluated the drives for their rewriting capabilities via the RW writing and erasing tests. These scores are especially relevant today as the RW media is slowly replacing the good old floppy for everything from booting the system to just transferring data from one machine to another.

RW-Assorted Write Speed: We burned the folder containing files ranging from 1 KB to 100 MB on a CD-RW. We tested the Writers using an ASUS 16x media. Although two of the drives, the Iomega and Yamaha, were capable of re-writing data at 24x, the unavailability of appropriate media forced us to go with the a 16x RW CD. The ASUS writer did wonderfully in this test; it finally overtook its closest rival, the Iomega drive, by logging 322.95 seconds, beating it by 7 seconds. The Benq 4012P finished last, taking 530.86 seconds to complete the task at a speed of 12x—

test drive ■ storage solutions



this is at least 10-15 per cent slower than what you should expect.

RW-Erase Speed: In this test, we erased 700 MB of data at the highest speed supported by the drive. Once again the ASUS Writer logged the fastest time (329.77 seconds), just seconds faster than the

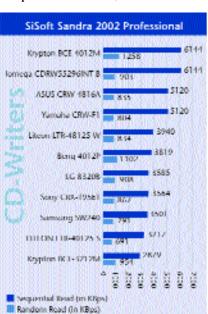
Iomega drive (331.77 seconds). The drive which took the longest time was the Yamaha CRW-F1, logging 532.7 seconds.

Read tests (CDs): The whole point of installing a CD-Writer is that it serves the dual function of burning data onto CDs and also works as a regular CD-ROM drive.

Assorted Read Speed: To evaluate the capability of a CD-Writer to read a normal CD-ROM, we tried copying 700 MB of assorted data from the Digit Test CD to the hard disk. The ASUS CRW-4816A completed this task in the fastest time, logging 138.73 seconds—this translates to a data transfer rate of about 5 MBps. The ASUS drive will be best suited for the kind of people who are copying lots of data like images and important work related files on their PC like DTP house, and so on. The slowest here was the LITEON LTR-BCE-4012M, which took 234.31 seconds.

Disk Registration: This test measures the time taken by the OS to recognise the CD. The fastest drive here was the Yamaha CRW-F1 with 8.71 seconds. The LG 8320B was really slow and took 14.7 seconds—long enough to be irritating.

Exact Audio Copy: Here, the first, middle and last track is ripped from an Audio CD to WAV format. The best result was presented by the Yamaha, which ripped all three tracks in 38.04 seconds, followed by the Krypton BCE-3212M (43.38 seconds). The slowest here was the Samsung SW240, which took 38.49 seconds just to rip the middle track; its overall time was 106.2 seconds. If you



drive mainly to rip Audio CDs and also burn data occasionally, the Krypton works out to be a better choice as it is cheaper than the Yamaha. SiSoft Sandra 2002 Pro: The SiSoft Sandra 2002 Pro benchmarking suite helps determine the different data transfer speeds and the drive access time. In the sequential read test, the Iomega Writer and Krypton BCE-4012M logged 6 MBps. In the random read test, the Kryp-

are planning to buy a

ton BCE-4012 once again logged the highest data transfer speed of 1258 KBps, crossing the 1 MBps mark. This CD-Writer also returned the fastest average access time, hence making it an ideal candidate for use as a CD-ROM drive. This drive is best for those who want a good CD-ROM drive and also occassionally want to be able to burn CDs. Benq too crossed the 1 MBps mark by logging a random read score of 1100 KBps.

Nero CDSpeed v1.0: The Nero CDSpeed v1.0 benchmarking suite tests the range of speed the drive can reach. It measures both the fastest speed and the slowest, and also gives the average speed of the drive. In this test, the best performer was the Krypton BCE-4012M. It reached a maximum speed of 49.94x, higher than its rated maximum speed of 48x. The slowest speed it logged was 23.33x, which is higher than the other CD-Writers. If you intend to use the CD-Writer to watch VCDs and play AudioCDs and don't mind a slower writing speed, you will find this CD-Writer quite suitable.

DVD-ROM Drives

A DVD-ROM drive is ideal for those who wish to watch theatrequality movies from the comfort of their living room. Besides, it also reads all optical media and is a better upgrade from the plain CD-ROM drive, since it is a cheaper buy when compared to CD-Writers.

Features

The DVD drives did not offer much in terms of variety in speed—all the drives sported 16x read speed for DVDs, which is currently the fastest speed available, and a 40x to 48x read speed for CDs.

All the DVD-ROM drives we received came with a healthy buffer size, though the buffer space allotted was small compared to the CD-Writers—not surprising, considering that these drives are not meant to burn CDs or DVDs. All drives offered 512 KB buffer, except the Pioneer DVD-106S/2, which had only 256 KB buffer.

Build quality of the tray becomes important here too. The Pioneer drive stood apart from the rest with its slot-in disk-loading mechanism. This imparts a level of sturdiness to the build of this drive that is absent in its competitors. All seven DVD drives featured in this test allowed for vertical usage.

There wasn't much in the name of package content for the DVD drives. Almost all provided an audio cable, but a few like the Pioneer skimped on this. As for the IDE cable, only Samsung and Sony include this. Software bundling came in the form of Asus-DVD 3.0 with the ASUS drive, WinDVD3.1 with the Benq, while

Region Locking

As a part of DVD technology licensing arrangements, the world has been divided into six geographic regions. This means that movies from Region 1 (USA and Canada) will not play on a DVD player designated for regions 2 to 6. Effectively, Region 1 discs play only on Region 1 DVD players, Region 2 discs play only on Region 2 DVD players and so on. A region code is embedded in the DVD-ROM drive. The first DVD disc inserted into a drive sets the region code for the drive. The drive's region can be changed four more times before it is permanently locked to a region. Inserting a disc that has a different region code than the drive's current code makes these changes.















DQ/AND		•		• •		
CATEGORY						CD-WRIT
	ASUS CRW-4816A	Benq 4012P	Iomega	LG 8320B	Liteon	Liteon
			CDRW55296INT-B		LTR-40125 S	LTR-48125 W
Features						
Drive Specifications						
Speed (Write\Rewrite\Read)	48X\16X\48X	40X\12X\48X	48X\24X\48X	32X\10X\40X	40X\12X\48X	48X\12X\48X
Interface	IDE	IDE	IDE	IDE	IDE	IDE
Buffer Underrun Protection Used	FlextraLink	Seamless Link	SMART-BURN	Superlink	SMART-BURN	SMART-BURN
Front Panel Controls/Indicators	Play/Fwd, Eject/Stop,	Play/Fwd, Eject/Stop,	Eject/Stop, Volume,	Eject/Stop, Volume,	Eject/Stop, Volume,	Eject/Stop, Volume,
	Volume, HeadPhone	Volume, HeadPhone	HeadPhone Jack,	HeadPhone Jack,	HeadPhone Jack,	HeadPhone Jack,
	Jack, Read and Write	Jack, Disk Indicator	Disk Indicator	Read and Write	Read and Write	Read and Write
	Indicators			Indicators	Indicators	Indicators
Onboard Buffer Size (KB)	2048	2048	2048	8192	1984	1984
Tray Drive Build Quality (scale of 5)	4	3.5	3	3.5	3.5	3.5
Vertical Usage (y/n)	V	V	V	V	V	✓
Package contents						
Audio Cable	V	V	V	V	V	✓
IDE Cable	V	×	~	V	×	×
CD-R blanks provided	1	1	*	×	1	×
CD-RW blanks provided	1	1	*	1	1	1
Software provided	Noro 5 5 9 0	Nero 5.5.7.1	Noro 5 5 0 2c	-	Nero 5.5.8.3	
Software provided	Nero 5.5.8.0	1 VEI U 5.5.7.1	Nero 5.5.9.2c	Nero 5.5.7.6 and	14610 3.3.6.3	Nero 5.5.8.3
Manuals on LO		,		InCD 3.23.1		
Manuals and Documentation	V	~	V	V	V	×
Performance						
Real world Tests (sec)						
ISO Write Speed***	155.64	195.98	157.46	205.39	154.81	158.97
Assorted Write Speed***	184	237.9	181.19	234.33	222.71	197.62
Assorted Read Speed	138.73	145.38	143.9	170.81	234.31	149.07
Audio Write Speed***	185.36	228.14	181.57	231.52	189.06	186.43
Raw Write Speed***	185.05	225.84	182.89	230.89	188.25	189.16
RW-Assorted Write Speed***	322.95	530.86	329.51	527.17	525.44	522.94
RW-Erase Speed***	329.77	529.79	331.77	521.45	523.91	526.25
Disk Registration test***	14.36	12.83	10.13	14.7	12.09	14.28
Exact Audio Copy (sec)***	14.30	12.03	10.13	14.7	12.07	14.20
Track 1	21.07	20.57	19.27	19.29	15.63	18.88
Track 2	13.54	14.58	13.04	13.88	12.62	11.62
Track 3	5.76	9.65	12.23	7.76	12.91	9.85
Nero CD Speed v1.0 (in X)						
Minimum speed	22.26	19.21	22.74	18.59	22.57	22.71
Average speed	37.7	36.51	37.57	31.8	36.35	37.36
Maximum speed	49.72	48.65	49.57	41.94	49.04	49.27
SiSoft Sandra 2002 Professional						
Sequential Read (KBps)	5120	3819	6144	3585	3217	3940
Random Read (KBps)	835	1102	903	908	691	834
Average Access Time (ms)***	98	89	93	101	121	109
Warranty & Support						
Replacement warranty	**	**	*	*	*	*
Period of warranty (Years)	1	1	1	1 3 1/4	1	1
	· ·	ı	digit	digit	I .	- I
Overall Score	15 /	14.4			12.4	11.4
Features (20%)	15.6	14.4	13.2 MARKER 2008	15.4 MATTHER 1888	13.4	11.4
Performance (50%)	39.53	33.72	39.89	32.13	33.51	35.23
Warranty & Support (10%)	5	5	5	7	3	3
Value for Money (20%)	11.00	16.06	10.89	18.64	16.46	14.80
Overall Product Rating	71.13	69.18	68.98	73.13	66.37	64.43
Overall Grade	A	(A)	(A-)	A	(B)	B
Vendors Name	Neoteric Infomatique	BenQ	Neoteric Infomatique	LG Electronics	Media Tech	Media Tech
Phone	022-4172600	022-5705230	022-4172600	0120 4560000	022 2206404	022-2396696
				0120-4560900	022-2396696	
E-mail	sales@	pankajpamani@	sales@	response@ezbuy.com		sales@
	neoteric-info.com	benq.com	neoteric-info.com		mediatechindia.com	mediatechindia.com
Webpage	www.asus.com	www.benq.com	www.iomega.com	www.lgindia.com	www.	www.
					mediatechindia.com	mediatechindia.com
Price (in Rupees)	6,680	3,995	6,500	3,400	3,800	4,200
	I	I	I	I	I	

Disclaimer: * The drives are replaced within warranty period



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Krypton	Krypton	Samsung SW240	SONY CRX-195E1	Yamaha CRW-F1
BCE-3212M	BCE-4012M	J		
32X\10X\40X	40X\12X\48X	40X\12X\40X	40X\12X\48X	44X\24X\44X
IDE	IDE	IDE	IDE	IDE
Superlink	Superlink	JustLink	PowerBurn	SAFEBURN
Play/Fwd, Eject/Stop,	Play/Fwd, Eject/Stop,	Eject/Stop, Volume,	Eject/Stop, Volume,	Eject/Stop, Volume,
Volume, HeadPhone	Volume, HeadPhone Jack, Disk Indicator	HeadPhone Jack, Disk	HeadPhone Jack, Disk Indicator	HeadPhone Jack, Disk
Jack, Disk Indicator	Jack, Disk Indicator	Indicator	Indicator	Indicator
2048	2048	8192	1984	8192
3.5	3.5	4	4	2
/	V	V	V	×
/	✓	V	×	✓
/	V	V	×	V
t .	×	1	×	1
1	2	1	×	×
NTI CDMaker 5.5.7	NTI CDMaker 5.5.8	Nero 5.5.7.8 and InCD 3.0	Nero 5.5.8.3 and InCD 3.12.0	Nero 5.5.8.17
K	×	V	×	V
261.44	255.61	192.51	152.56	250.08
343.76	297.76	283.13	192.63	330.58
224.38	144.23	169.17	166.18	165.79
340.16	464.96	251.54	184.69	331.16
332	336.57	250.96	187.22	327.29
524.41	456.49	438.54	503.85	524.81
520	442.76	440.42	504.35	532.7
14.16	9.87	11.26	13.69	8.71
17.20	10.57	40.54	10.04	10.07
16.38 15.35	19.57 16.27	40.54	18.84	18.96 12.51
8.04	7.64	38.49 27.17	14.06 12.53	6.57
0.04	7.04	27.17	12.53	0.57
15.56	23.33	18.7	19.56	19.4
31.46	37.83	31.66	32.19	32.19
41.53	49.94	41.36	42.44	43.45
11.00	17.71	11.00	12.11	10.10
2879	6144	3501	3564	5120
954	1258	791	867	804
93	88	111	104	100
*	*	*	*	**
2	2	15 months	1	1
13.4	13.4	16.6	9.2	13.8
28.95	33.46	29.42	34.37	31.06
8	8	5	6	5
18.36	17.24	10.23	7.00	4.79
68.71	72.10	61.25	56.57	54.65
(A)	A	6	©	G .
Priya Limited	Priya Limited	Samsung Electronics (SEIIT)	Rashi Peripherals	Neoteric Infomatique
022-2663611	022-2663611	011-6322517	022-8260258	022-4172600
salesbom@	salesbom@	marketing@	ho@rptechindia.com	sales@
priyagroup.com	priyagroup.com	samsungindia.com		neoteric-info.com
www.priyagroup.com	www.priyagroup.com	www. samsungindia.com	www.rptechindia.com	www.yamaha.com
3,075	3,625	6,000	8,300	12,500

the rest of the drives had different versions of PowerDVD. The Pioneer drive did not come with any DVD playback software.

Performance

Our performance test covered all areas such as assorted read speed, disk registration test and VOB file extraction test from a DVD media.

We however did not get one drive which performed well across the category—if it performed really well in assorted read speed, it was average in the disk registration test and so on. This was the case with all the drives and because of this we had to look at the overall figure to get a winner in the performance category.

Read tests (DVDs): Movie-watching would be no fun if your DVD-ROM drive is unable to access the data fast enough to provide a smooth experience. Hence, the drive's read speed and access speed becomes critical.

VOB File Extraction: This test helps evaluate the efficiency with which the DVD-ROM drive can copy a DVD on to the hard disk, so that you can play it off the hard disk. We used Flask MPEG v0.594 for this test, which determines the time taken to extract a VOB file into the AVI format using the latest DivX codec. The Samsung SD-616 logged the fastest time—it took 74.38 seconds to complete the extraction process. The Benq DVP-1648A wasn't far behind with 74.61 seconds. The LITEON LTD-165H shocked us by coming last, especially considering that this drive logged the best time in the assorted read test.

Nero DVDSpeed: This is a synthetic benchmark that evaluates multiple parameters that affect the overall performance of a DVD-ROM drive. The first parameter evaluated was the 'seek time'. This refers to the average time taken by the drive to access data from a particular location. It is computed by dividing the time taken to complete a large number of random seeks by the number of seeks performed. If you manage a lot of data either for yourself or for the office on CDs or DVDs, you should look out for this result whenever considering a DVD-ROM drive.

The LITEON LTD 165H logged a seek time of 67 ms. This was an impressive show considering that the runner up, the ASUS DVD E616, logged 169 ms (around 130 per cent more). The slowest in this test was the Sony DDU-16210-C0, which took

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SEORE							
BOARD	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 12	100 15	* 68			1 2 2
CATEGORY				DVD-ROM DRIVES	.0		
	ASUS DVD-E616	Benq DVP-1648A	LG DRD-8160B	LITEON LTD-	Pioneer DVD-	Samsung SD-616	Sony DDU1621
Features				16511	1003/2	30-010	0001021
Drive Specifications						'	
Speed (DVD-ROM \CD-ROM)	16X\48X	16X\48X	16X\48X	16X\48X	16X\40X	16X\48X	16X\40X
Disk loading mechanism	Tray	Tray			Slot-In	Tray	Tray
Interface (IDE/SCSI)	,	IDE	,	,		IDE	IDE
Data Buffer Size (KB)						512	512
Front Panel Controls/indicators							, Stop/Eject, Volume
	Eject/Stop, Volume,	, HeadPhone Jack,	HeadPhone Jack, Disk Indicator	Eject/Stop, Volume	HeadPhone Jack, Disk Indicator	HeadPhone Jack, Disk Indicator	HeadPhone Jack, Disk Indicator
Package contents		['	'	Į į			
Audio Cable	v	V	V	V	×	/	V
IDE Cable	×	*	*	*	×	· '	~
Software Provided	AsusDVD 3.0	WinDVD 3.1 and DOS driver v2.14	PowerDVD 4.0	PowerDVD 4.0	None	PowerDVD 4.0	PowerDVD 2.55
Manuals and Documentation	~	Y'	<u> </u>	V	~	'	V
Performance							
DVD Test (sec)***	<u> </u>		<u> </u>		<u></u>	<u> </u>	
Assorted Read Speed	146.46					147.76	168.49
Disk registration test	12.08	8.89	7.6		9.76	15.13	11.71
VOB File extraction test - Flask MPEG	78	74.61	76.83	84.76	75.72	74.38	78.6
Nero DVDSpeed v0.53		1'	1'	[l		
Seek time (ms)***	169	75	105			89	458
CPU Utilization (%)***	1	<u>[1</u>	1 ,		1	1	1
Spin down time (sec)***	7.77				3.04	3.74	3.14
Average speed (X)	7.04	7.22	3.73	7.46	7.27	7.38	3.71
SiSoft Sandra 2002 Professional				(· ·			
Sequential read (KBps)	6144	9216				8192	5120
Random Read (KBps)	625	1100			1119		513
Average Acess Time (ms)***	91	51	71	82	50	54	111
Exact Audio Copy (sec)***	00			1			
Track 1	15.83	17.51	26.51		22.05	26.16	20.27
Track 2	13.07				25.07	32.71	15.68
Track 3	7.78	8.64	23.98	7.07	19.76	24.81	8.17
Warranty & Support	**	**			**		
Replacement warranty	1	A THINK	<u>(</u>	1	1	15 months	1
Period of warranty (Years) Overall Score	1	Aidit		- High		15 months	1
Features (10%)	17	15	15	17 William 200	9	18	17
Performance (50%)	35.79	42.66	32.49			36.38	31.73
Warranty & Support (20%)	5	42.00	32.49		38.77	5	4
Value for Money (20%)	6.32	15.4	13.57	-	10.19	10.88	8.66
Overall Product Rating	64.11	78.06				70.26	61.39
Overall Grade	64.11	48.00	(B)	A	6 0.70	(B)	©
Vendors Name		BenQ				Samsung	Rashi Peripherals
vendors ivanie	Infomatique	Della,	LG LIECTIONICS ,	Iviedia recir	Williemonic System	Electronics (SEIIT)	Rasili i chphorais
Phone		022-5705230	0120-4560900	022-2396696	022-8010871	011-6322517	022-8260258
E-mail		pankajpamani@			mnemonic@	marketing@	ho@
L-111an		beng.com	ezbuy.com	1	vsnl.com	samsungindia.com	rptechindia.com
Webpage		www.benq.com	www.lgindia.com		www.pioneer.com	www. samsungindia.com	www. rptechindia.com
Price (Rs)	6,680	2,995	2,800	2,650	3,750	4,000	4,500

Disclaimer: * The drives are replaced within warranty period ** Repair is carried out during warranty period ***Lower the better

458 ms to seek out the necessary data.

We also logged each drive's CPU utilisation to get a handle on the amount of CPU resources hogged by a drive under usage. All seven drives did well here, utilising not more than 1 per cent of the CPU power, utilising DMA (Direct Memory Access) to the full.

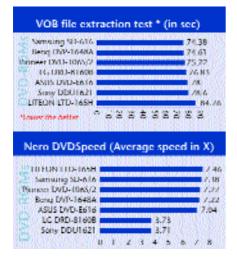
Many new drives save power by spinning down when the drive is not in use. This is essentially a power-saving feature and is designed to lighten the load your computer's power supply has to carry. The drive with the fastest spin-down time was the Benq DVP-1648A, logging 1.95 seconds. A close second was the

LITEON LTD-165H, which took 2.31 seconds. The ASUS DVD-E616 disappointed us and took 7.77 seconds.

A 498 MB VOB file was used for calculating the average speed of the drive. This score holds import because one would buy a new DVD-ROM drive or upgrade from an older 8x drive to get better performance. If a drive can't live up to its rated speed, it doesn't make sense investing in it.

The winner in this category was the ASUS DVD- E616 with an average speed of 7.04x, while the Sony DDU1621-CO and the LG DRD 8160B with an average speed of 3.71x and 3.73x, respectively, performed under par.

digit 66



Read tests (CDs): Though all the DVD-ROM drives are rated between 40 and 48x, we observed noticeable differences in performance while reading CDs.

Assorted Read: This tests the DVD-ROM drive's ability to read an assortment of files that come in varying sizes. This test will interest those who often use

software CDs or CDs such as the Digit Interactive CDs, which contain a lot data in varying sizes.

A CD containing assorted data in the form of files ranging from 1 KB to 100 MB was copied on the hard disk and the time was noted. The LITEON LTD-165H was the fastest here, taking 144.14 seconds to copy the data. The ASUS DVD-E616 and Samsung SD-616 were just seconds behind, logging 146.46 and 147.76 seconds, respectively. The LG DRD-8160B was the slowest DVD drive and took 210.12 seconds to copy the CD to the hard disk. **Disk Registration:** The disk registration test shows how fast the drive can identify a CD or DVD. This test will be especially interesting to those who share their drives on the network for others to use.

We used the Digit Mindware CD (October issue) for this test. The Samsung SD-616 was the slowest, taking 15.13 seconds, whereas the LG-DRD 8160-B topped the test by taking only 7.60 seconds to recognize the CD. The Benq DVP-1648A finished second by identifying the CD in just 8.89 seconds.

Exact Audio Copy: We extracted three songs from an Audio CD, such that the first, the middle and the last tracks of an 80-minute CD were accessed. Since access speeds vary as we traverse the radius of a CD, this test would give us a good indication of the overall performance of the drive. Exact Audio Copy was used to evaluate the same. The overall winner of this test was the LITEON LTD-165H, which took just 33.91 seconds to rip all the three tracks. The slowest however, was the Samsung drive, which performed quite poorly with a score of 83.68 seconds.



Pro: The three tests carried out using SiSoft Sandra 2002 Pro were sequential read, random read and average access time. This benchmark gives an overall view of how a drive will perform under different

SiSoft Sandra 2002

The sequential read speed is the continuous read

conditions.

Hybrid DVDs

Nine leading consumer electronics manufacturers have jointly established the basic specifications for a next-generation large-capacity optical disc video recording format called Blue-ray Disc. These DVDs can hold six times the data as current standard discs. The new format will store more than 13 hours of film, compared with the current limit of 133 minutes.

High Density-DVD no doubt, is the enhanced form of current DVD format. Blue lasers have a much shorter wavelength than the red lasers used in current DVD players, allowing for much greater disc capacity. The new high definition format allows a capacity of 4.7 GB to 15 GB on a single-sided, single-layered disc and a capacity of 8.5 GB to 30 GB on a single-sided, double-layered disc. Some feel be more definite! that this provides a cost-effective upgrade path for media vendors and a backward-compatible solution for all those who've already built DVD libraries.

Current DVD players use 650 nanometre (nm) red lasers, while CD players use 780 nm diodes. It will not be possible to play Blue-ray discs with existing DVD and CD players, since these don't contain 405 nm lasers. Blue-ray drives will need to contain 780, 650 and 405 nm lasers in order to be compatible with CD and DVD discs.

speed ability of the drive and is useful while reading large single files such as ISO images.

The winners in this category were the Benq DVP-1648, Pioneer DVD-106S/2 and LITEON LTD 165-H with a read speed of 9.216 MBps each. These drives are thus ideally suited for those who copy a lot of large single files from optical media to the hard drive or are into image editing. The LG-DRD 8160 B performed poorly with a sequential read speed of 4.096 MBps—a slow solution when compared to its competition.

The random speed determines the ability of a DVD-ROM drive to randomly read data from an optical media. This test will interest those who have a lot of clipart to be copied to the hard drive from either CD or DVD media, such as DTP shops. The two drives in competition with each other were the Pioneer DVD-106S/2 and the Benq DVP-1648A with a random read time of 1119 and 1100 KBps, respectively. This was the only test in which the Pioneer drive—which had won past DVD-ROM comparisons—shone. The poor performer in this test was the Sony DDU 1621-C0, logging 513 KBps only.

The access time tells us how fast the drive can access a particular track and start reading the information. Here, the Pioneer DVD-106S/2 won by taking just 50 ms. The Benq DVP-1648A was a close second with 51 ms—a 1 ms difference that makes little practical difference. Sony was the slow respondent again and probably was the only drive to cross the 100 ms mark by logging 111 ms as access time.

What it all leads to

The competition between the CD-Writers was really tough. We got some unexpected results, where drives with a faster rating were overtaken by drives with a slower rating and older technology. What this tells us is that 32x is still where it's at—it not only performs optimally, but also costs much lesser.

Your Shopping Checklist

CD-Writer

- ✓ Make sure that the drive has a high spin speed and fast access times. Access time is more important if you need to read non-sequential data such as a game.
- ✓ Does it support over burning?
- ✓ Does it support Multi-Session and Incremental Packet Writing?
- ✓ Does it support Raw writing?
- ✓ Does it include a CD burning software?

DVD-ROM Drive

- ✓ A DVD-ROM drive on the other hand should be able to read dual-sided DVD media
- ✓ Does it include DVD playback software?

Common

- ✓ Can the drive's firmware be upgraded for future support?
- ✓ Are drivers for operating systems like DOS and Win 3.x included?
- ✓ Are the audio and IDE cables included?
- ✓ Does it have at least a one-year warranty?

Our Best Performance Award winner was the Iomega CDRW55296INT-B CD-Writer. Also worthy of mention are the Samsung CD-Writers—they were the most feature-packed Writers and came complete with the requisite cables, software and manuals.

The LG 8320B, a 32x CD-Writer, had the highest overall score, even though it did not win in terms of pure performance. It wins our Best Value Award.

Looking onto our other match up between the DVD-ROM drives, we found that the overall as well as the Best Performance Award winner was the Benq DVP-1648A—it offered the best of performance at a reasonable price of Rs 2,995.

The LITEON LTD-165H drive, which wasn't far behind in any of the tests, is even cheaper than Benq and is an easy winner of our Best Value Award. The Pioneer drive, which was the winner in our last comparison, stood last here. This is really shocking, as the performance of the drive can't drop so much. Either Pioneer is not serious with their DVD-ROM business or the competition is working overtime to make their product the best in the world.

Decision Maker You want To back up a lot of data An excellent movie Just a decent optical drive you can upgrade to experience You need A fast and reliable CD-A DVD-ROM drive of A cheap CD-Writer or a Writer good quality DVD drive Look for A 32x or faster CD-A 16x DVD-ROM drive Any drive which can read Writer, with 2 MB buffer with 512 KB buffer data at a speed of 48x The models LG 8320B or Iomega Benq DVP-1648A or LITEON LTD-165H or CDRW55296INT-B LITEON LTD-165H Krypton BCE-4012M Rs 3,400 to Rs 6,500 Rs 2,650 to Rs 2,995 Rs 2,650 to Rs 3,075 Price range

The winners!

Iomega CDRW55296INT-B CD-Writer: Iomega's CD-Writer came bundled with Nero 5.5.9.2c, which is not all that old a version. This drive includes a 2 MB buffer.

This would appear to be rather less for a 48x CD-Writer, but despite this, the Writer logged the best performance scores in our tests.

The writer includes SMARTBURN burnproof technology to ensure that there are no errors during the write process.

Though it is rather expensive at Rs 6,500, it delivers when it comes to performance.

This 48x Iomega CD-Writer can burn a 700 MB CD in under 4 minutes

LG 8320B CD-Writer: If you are looking for the best combination of price and performance, go for the LG 8320B. This CD-

Writer is not only inexpensive but is also feature rich, with a decent performance to boot. Though it is a 32x drive, it has an 8 MB buffer which is an

attractive plus. The Writer incorporates Superlink burnproof technology to eliminate CD wastage even on a slower machine. The

Writer comes with a one-year warranty and is supported by a vast network of service centres spread across many cities.

The LG 8320B offers an 8 MB buffer for error free burning

Benq DVP-1648A DVD-ROM Drive: The Benq DVP-1648A DVD-ROM drive gave the best results across the board.

The drive had a 512 KB cache to enable an error free movie experience. The drive is good if one is going to use it more as a CD-ROM drive as its transfer rate is quite decent. The best part is that the drive is so competitively priced that the competi-

tion will be forced to re-work their pricing policy to compete with Benq.

The Benq DVP-1648A offered outstanding performance in all our tests

LITEON LTD-165H DVD-

ROM Drive: LITEON LTD165H DVD-ROM comes at a price that will be a sure attraction for many—it is available for only Rs 2,650. The drive has 512 KB cache and

comes bundled with PowerDVD

4.0 DVD
playback
software. It
also serves as
an excellent substitute for a CDROM drive thanks
to its fast data transfer rate. Overall, it
offers a good blend

The LITEON LTD-165H
: great performance at
a great price

of performance, features and price and is an easy winner of our Best Value Award.

ALIASGAR PARDAWALA and AHMED SHAIKH



the freedom you need to take your data with you, no matter where you go or what your applications

s the lines between our professional and personal spaces blur, we feel a greater need to carry our data from one sphere to another. So how do you transfer data that's more than a gigabyte? The answer lies in external portable devices. These devices are becoming smaller and at the same time their capacity to store data is increasing at a rapid rate. Portable devices such as hard drives, Zip drives, thumb drives and CD-Writers are also ideally suited to store your important data since they can reliably hold greater amounts as compared to the floppy disk. Add to that the fact that they are compact, light in weight and support a plethora of interface standards such as USB 2.0, FireWire, SCSI and so on. Even in a country like ours, where the floppy disk still rules, people are slowly shifting to portable solutions. So say hello to these new sleek members of the storage family-the external portable devices.

Digit Test Process

We tested all the portable devices on our test machine comprising a Pentium 4 2.8 GHz processor on an Intel D850EMV2 motherboard with 512 MB of RDRAM. The graphics card used was a Visiontek GeForce3 with 64 MB of DDR memory and a Seagate ATA IV. A 40 GB hard disk was installed on the primary IDE channel. All the test drives were connected to the appropriate ports (USB 1.1 or 2.0) and the necessary drivers and benchmarking utilities were loaded on to the drive after installing Windows XP. The latest drivers for the mainboard and the IDE channel were installed for maximum performance gain.

Test methodology

The drives were tested on four primary parameters: features (30 per cent), performance (40 per cent), value for money (20 per cent) and warranty and support (10 per cent). The weightages allotted to each parameter was used to calculate the overall scores.

Features: Being portable, the device should weigh as less as possible, support all major operating systems and should not be bulky. Apart from this, the build quality also matters. We took all these factors into account as we monitored the devices through our feature analysis.

Performance: We used the SiSoft Sandra 2002 Pro benchmark. It gave vital information about the drives such as the data transfer rates, the sequential and random read as well as write speeds, and the average access time. SiSoft Sandra 2002

continuously reads and writes data on to the disk and at the end, gives the separate as well as the overall scores.

To test the time a drive takes to read data, we transferred a set of assorted files to the tune of 1.27 GB from the system hard drive to the device under test. The assorted write time was then noted as the time taken to copy the same files back to the system drive. The sequential tests (both read and write) of the drives consisted of transferring a single large file between the portable and the fixed hard drive installed in the computer system.

Warranty and support: Warranty and support is very important for any device, especially for a device meant to be used on the move. Here we took into account the number of years of replacement warranty provided by the manufacturer.

Value for money: The value for money quotient was calculated by determining the sum of performance and features divided by the price of the device.

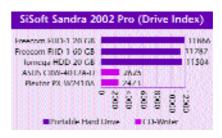
How they fared

In our test analysis, we looked into different features of the device such as weight, dimensions, storage capacity, interface and so on. The documentation provided with each of the drives was also checked. For evaluating performance, we conducted synthetic as well as real world tests and the performance figures were calculated accordingly.

Performance

An external storage device should not only store data but must also transfer the same at a fast rate. To gauge the transfer rates and evaluate the drives on a technical level, we ran synthetic as well as real world tests. SiSoft Sandra 2002 Pro served as our benchmark, while we transferred a set of files from the system drive to the device under test to paint a real-world picture.

SiSoft Sandra 2002 Pro: Here we noted different scores such as the sequential and random read and write scores, the drive index and the average access time. These numbers give you a



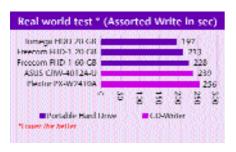
probable transfer rate that the drive is capable of delivering. The sequential read rate of a storage system, for example, tells you how fast a drive can read large single files, say the

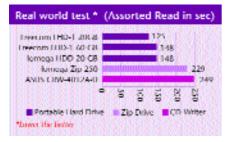
250 MB Photoshop file you have been working on. Similarly, the random read rate will dictate its potential performance while reading randomly placed data, from a game CD or a fragmented drive, for example. Lets first glance at the external hard drive scores.

The Freecom FHD-1 20 GB posted some of the best scores in this test—it showed the highest random write score of 7 MBps and was also able to achieve the highest drive index of 11866. The drive with the best access time was the Iomega 20 GB with an average access time of 10 seconds. In the same test, the Freecom 60 GB drive scored 7 MBps of random write and its drive index was also low at 11287.

Moving on to the Zip drives, they scored very low compared to the hard drives. The ZIP 250 managed to complete the tests with the lowest posting of a 624 drive index. Next come the CD-Writers. Here the drive with the lowest access time was the Yamaha CRW3200UX-VK at 108 ms. This drive also posted the highest random read score of 0.79 MBps. The drive with the best sequential write and drive index score was the ASUS CRW-4012A-U. It was able to score a sequential read speed of 3.8 MBps and also an impressive drive index of 2625. So if you need a speedy external writer, your search ends here.

Real world tests: This is where we get a picture of how effectively a drive translates its potential greatness into real performance. Beginning with the portable hard drives, the Freecom FHD-1 20 GB completed the assorted read test in just 125 seconds,





whereas the other Freecom drive and the Iomega HDD 20 GB took 23 seconds more. The Freecom 20 GB impressive gave results in the sequential read test too, beating the other hard drives by a good margin of 38 seconds. The Iomega drive beat some stiff competition in the assorted write test by posting a score of 197 seconds. All the drives rivalled neck and neck in the sequen-

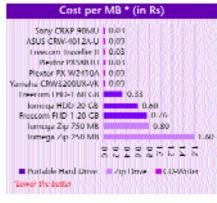
tial write test, but the Freecom FHD-160 GB won by scoring just 61 seconds.

Out of the two Zip drives that we received, the Zip 250 took 229 seconds in the assorted read tests while the Zip 750 MB took 480 seconds to get the same job done. The reason for this is that we used a larger file for testing the 750 MB Zip drive.

Moving on to the CD-Writers, the one drive that ripped through the test was the ASUS CRW-4012A-U. This Writer took just 239 seconds to write a 700 MB assorted CD. Following closely was the Plextor PX-W2410A, which did the job in 256 seconds. The drive that took the maximum was the Plextor PXS88TU, an 8x drive that took 694 seconds.

Cost per MB: The total cost of ownership aspect must be kept in mind while buying a portable solution. A device itself might seem affordable, but the added costs of the media may be too high, making it a costly package on the whole. To evaluate this angle, we rated the devices on the cost that each MB of storage space the user will have to pay for: the lower the cost per MB for a drive, the more attractive is the drive as a purchase.

CD-Writers offered the best price per MB in with comparison rest of the devices: but it's important to note that portable Writers themselves cost quite a lot. This brings us to the hard drives. Here the Freecom 60 GB external hard drive



gave us the great value of just 33 paise per MB. Both the Zip drives are not a good choice as far as value per MB is concerned. The Iomega 250 MB will cost you a cool Rs 1.60 per MB and the Iomega 750 MB will set you back by 80 paise per MB.

Features

There are some features that are mandatory for a portable device and these should be considered before making a buying decision. Since portable is its essence, the weight, build-quality and form factor are of primary importance. It is also important that it supports all major operating systems. To see exactly how these features matter, we put the devices through our features analysis.

The Freecom FHD-1 20 GB hard drive looked quite swanky with its eye appeasing indicator lights and two LED indicators on the power adapter to show data transfer. Apart from this, the drive also featured a cool blue LED on the front panel, which indicated the readiness of this device. While aesthetically appealing, the device is too heavy—a big no-no for any portable device. Another blow to the carry-anywhere nature of this device is its vulnerable outer shell made of plastic. The base of the device is also designed such that it

> cannot be placed firmly on a desk. Packing 40 GB is more. the Freecom FHD-1 60 GB drive that has

> > the exact same design. This sibintegrates a

PCMCIA converter on to the USB data cable, saving you the The ASUS CRW-4012A-U CDtrouble of carrying a PCMCIA Writer has rubberised foot pegs adapter to connect the USB cable. It also has a one-touch

sync button, which when pressed, automatically updates and synchronises data content across a portable or a personal computer system.

If you want something that's comparatively smaller in

test drive ■ storage solutions

The Iomega Zip 750 drive does-

and requires external power

n't feature a manual eject button

size, try the Iomega 20 GB hard drive, which comes in a manageable size and was the lightest of the bunch. This drive has just one LED that doubles up as the power indicator and the data transfer indicator, and it doesn't score badly in the looks department either. However, the Iomega requires a special converter for its power adapter to fit into Indian power sockets.

Shifting our focus to the Zip drives, the ice blue Iomega Zip 250 MB drive was the first to catch our attention. Rubber pads on either sides of the drive give it a good grip on the desk and a stand enables it to be placed vertically—an excellent space-saving feature. A feature that further enhances its portability is the fact that it draws power from the USB port and thus does not require an external power supply. Although the Iomega drive paints a pretty picture and features some nifty features, its build quality could have been better. For instance, the absence of a manual eject button means that if the Zip medium gets stuck, you will be forced to open the drive up, causing the drive damage. Moving on to its elder brother, the

Iomega Zip 750, this drive looks just as good as its sibling and improves on the former's weak build quality. But this drive too does not feature a manu-

al eject button and requires external power. Among the

Among the portable CD-Writers, the Plextor PX-W2410A is capable of burning CDs at a maximum speed of 24x and comes in a compact design and a durable metallic

Maintenance Tips

- Always handle the device with outmost care when on the move; even the slightest jerks could damage the drive.
- Carry the device in a cushioned pack or wrapped in a bubble wrap to absorb shock.
- Do not place the device on an uneven surface as this could damage the internal mechanism while the drive is powered on.
- Always use branded media as it ensures better data integrity.
- While in use, keep the device away from high voltage devices such as monitors to protect it from Electro Magnetic Interference (EMI).

body. But the characteristics that impart the drive sturdiness also take away from its appearance, lending it a none-too-pleasing boxy look. The power switch is non-intuitively placed on the back of the drive. The bundled accessories include one CD-RW disk and burning software in the form of Nero 5.5. It disappointed us, however, by leaving out the power cable.

The Yamaha CRW-70 wears a retro look in eye-pleasing colours. An array of buttons on the drive's front panel assures ease of control and it provides inputs for the Line In and Line Out connectors. The CRW-70 also hosts an LCD screen on the front panel and the slide button provided underneath the drive provides a hassle-free solution, in case your CD gets stuck inside the drive. However, a flip-open design for loading CDs increases the chances of dust finding its way into the drive and collecting on its delicate lens.

The ASUS CRW-4012A-U is an impressive 40x Writer with

	Decision Maker								
	A portable CD-Writer	A portable hard drive	A Zip drive						
What will I get	Lowest cost per MB, easy of use, medi-	Low cost per MB, high performance, cum-	Low performance, low availability of						
out of the	um price, medium performance, high	bersome to use, high purchase cost	media, medium cost per MB, not very						
portable device?	compatibility, high availability of media		easy to use						
I work with	CD-RW s are not known for their	Hard drives are known for their high per-	Go in for these drives only if a Zip disk						
image editing	speed and therefore not suited to	formance. Opt for this solution if you need	is the preferred medium of data						
and page layout	large-volume print applications. Opt	high performance with no issues towards	exchange amongst your clients						
software	for this only if price is a barrier	price	Solution: Iomega Zip 750 MB						
	Solution: Plextor PX-W2410A	Solution: Freecom FHD-1 20 GB	(Rs 10,700)						
	(Rs 12,950)	(Rs 15,500)							
I edit audio and	If your work involves relatively smaller	The best solution for large AV productions,	Not recommended due to low per-						
video files	file sizes, CD-Writers are recommend-	hard disks offer great performance but at a	formance, relatively lower capacity of						
	ed as they are low priced	high price	media and rare availability of media						
	Solution: ASUS CRW-4012A-U	Solution: Freecom FHD-1 60 GB	Solution: None recommended						
	(Rs 12,500)	(Rs 20,500)							
I am a home or	Highly recommended due to low cost	3 .	Not recommended due to low avail-						
a small office	and wide availability of media	and your work involves very large amount	ability of media						
user	Solution: ASUS CRW-4012A-U	of data	Solution: None recommended						
	(Rs 12,500)	Solution: Freecom FHD-1 60 GB							
		(Rs 20,500)							
I have very basic	9 ,	Not recommended due to high cost and	Not recommended due to low avail-						
backup needs	inherently higher shelf life, and low	relative frailty of medium	ability of media and a relatively high						
	cost of media and easy availability	Solution: None recommended	cost						
	Solution: ASUS CRW-4012A-U		Solution: None recommended						
	(Rs 12,500)								

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rubberised foot pegs that go hand in hand with a great design. Three LEDs on the front panel indicate the power, read and write status of the device. This was the only external CD-Writer that can be vertically mounted and lets you burn your CDs in this position. Again, the only thing that seemed wrong was the power switch located inconveniently at the rear of the drive.

One of the lightest and most compact Writers that we received was the Sony CRXP-90MU. A 24x Writer, the drive is also capable of reading memory sticks and provides a button underneath its body for rescuing jammed CDs. The Freecom Traveler II, a 16x device, was also small in size and appropriately lightweight. This drive comes with a handy rechargeable backup battery, but its average build quality is prone to damage on the move. The laptop-type drive loading mechanism might not be appreciated by all users, since one has to manually pull the tray out, even after pressing the eject button. The huge, impractical size of the Yamaha CRW3200UX-VK made us doubt its capability as a portable device. Although the drive features a good build quality, its average looks mar its overall aesthetic value, while a short USB cable takes away from ease of use.

Warranty and support

Here we logged the period of warranty for each of the devices and even noted down the type of support provided for this drives by different brands. All the brands in this shootout offer to replace the faulty drive within the warranty period.

Buying Tips

- Choose a compact device that will fit into your luggage unobtrusively
- The device should be light enough for you to carry along for long distances
- Buying a device that offers a lower cost per MB is advisable
- Choose a device for which the media is easily available
- Always investigate the details of the warranty and take them down in writing

What it all leads to

The tests showed that external hard drives provide the best portable solution in terms of performance and storage space. This makes it an ideal choice for those who work with image and video editing applications that require huge amounts of space. But the Zip drive, on the other hand, stores your data securely for a longer period of time. And if you need to swap data frequently between devices, the best choice would be a CD-Writer. Even though the initial price of the device may be high, the media is cheap and easily available.

The winners!

The winner of the Best Performance Award in our test is the Freecom FHD-1 20 GB drive. This drive managed to outrun every other contender in the comparison in terms of pure

1/2 page H AD

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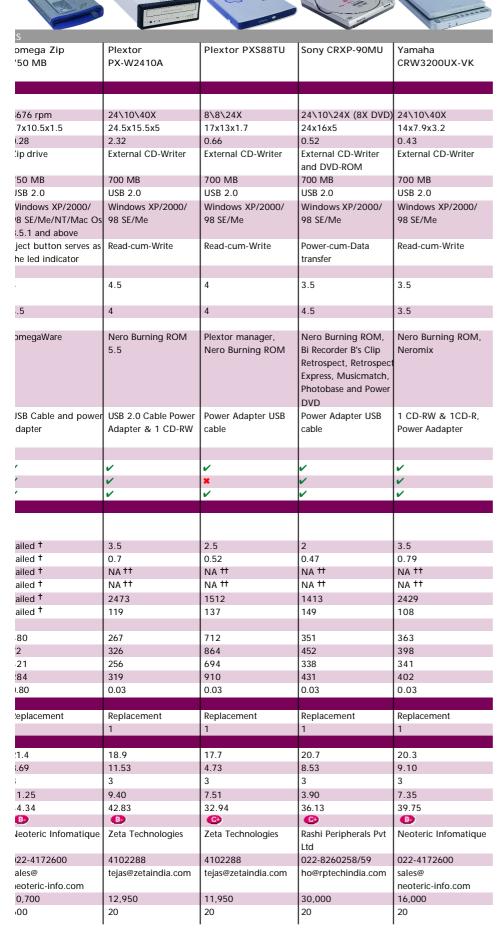






CATEGORY						EXTERNAL STORA
CATEGORY	ASUS	Freecom	Freecom	Freecom	Iomega HDD 20	lomega Zip 250
		FHD-1 20 GB	FHD-1 60 GB	Traveller II	GB Portable Hard	Tomeya Zip 250
	CKVV-4012A-0	FHD-1 20 GD	 LUD-1 00 GP	If aveiler ii	Drive	
Features					Drive	
Drive Specifications						
Speed	40\12\48X	5400 rpm	5400 rpm	16\10\24X	4200 rpm	NA**
Dimensions (LxWxH in cm)	22x15.5x4.8	18.6x11.2x4.7	18.6x11.2x4.7	15x14x2.5	18.9x8.9x1.7	17x12.x15
Weight (kg)	2.02	0.65	0.65	0.6	0.4	0.28
Device Type	External CD-Writer	Portable HDD	Portable HDD	External CD-Writer	Portable HDD	Zip drive
Device Type	LATERIAL OD-WING	FOITable TIDE	FOI table 1155	External OD-Willon	FOI (abic 1155	ZIP GITVE
Storage Capacity	700 MB	20 GB	60 GB	700 MB	20 GB	250 MB
Interface	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0
OS Support	Windows	Windows	Windows	Windows	Windows	Windows XP/2000/
oo sappo	XP/2000/98 SE/Me	XP/2000/98 SE/Me	XP/2000/98 SE/Me	98 SE/2000/Me/XP	XP/2000/98 SE/Me	98 SE/Me/NT/Mac Os
		XI, 2000.	XI / 2002.	76 52.233	7. 7. 2. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3.	8.5.1 and above
Visual Indicators	Power, Read and	On/Off, Data	On/Off, Data	Ready, Data transfer,	Power-cum-Data	Eject button serves as
violatia.isatsis	Write	Transfer, Ready	Transfer, Ready	Read and Write	transfer	the led indicator
Build Quality			114			
Sturdiness of Movable Parts	4.5	4	4	3.5	4.5	3.5
(scale of 5)		1	·			
Design Aesthetics (scale of 5)	4.5	4.5	4.5	4	4	4.5
Package contents	1	1.5	7.0	7	7	7.5
Bundled Software	Nero Burning ROM	Sync 1.0	Sync 1.0	Liquid Audio, Easy	IomegaWare	IomegaWare
bullated Software	5.5.8.0	Syric 1.0	Syric 1.0	CD Creator 5.1.1,	Tomegavvare	Tomegavvare
	5.5.6.0			Direct CD		
				Direct CD		
		0 .				
Accessories	Power Adapter,	Cables, Power Cord		Battery backup pack,	Cables, Power Cord	USB Cable
	USB Cord 1 CD-R,	& Adapter	& Adapter	power connectors,	& Adapter	
	1 CD-RW			1CD-R, PEN		
Documentation (Y/N)						
Manual	V	<u> </u>	V	~	V	V
Quick Start Guide		~	V	~	V	V
Troubleshooting	✓	<u> </u>	V	V	V	V
Performance						
Synthetic Test		1				
(SiSoft Sandra 2002 Pro)		L				
Sequential Read (MBps)	3.8	17	17	2	17	0.84
	<u> </u>					
Random Read (MBps)	0.79	4	4	0.67	4	0.64
Random Read (MBps) Sequential Write (MBps)	NA ††	4 13	4 11	0.67 NA ††	4 14	0.64 0.7
Random Read (MBps)		4	4	0.67	4	0.64
Random Read (MBps) Sequential Write (MBps)	NA ††	4 13	4 11	0.67 NA †† NA †† 1518	4 14	0.64 0.7
Random Read (MBps) Sequential Write (MBps) Random Write (MBps)	NA †† NA ††	4 13 7	4 11 3.5	0.67 NA †† NA ††	4 14 4	0.64 0.7 0.72
Random Read (MBps) Sequential Write (MBps) Random Write (MBps) Drive Index	NA †† NA †† 2625	4 13 7 11866	4 11 3.5 11287	0.67 NA †† NA †† 1518	4 14 4 11504	0.64 0.7 0.72 624
Random Read (MBps) Sequential Write (MBps) Random Write (MBps) Drive Index Average Access Time (ms)	NA †† NA †† 2625	4 13 7 11866	4 11 3.5 11287	0.67 NA †† NA †† 1518	4 14 4 11504	0.64 0.7 0.72 624
Random Read (MBps) Sequential Write (MBps) Random Write (MBps) Drive Index Average Access Time (ms) Real World File Transfer Test *	NA †† NA †† 2625	4 13 7 11866 11	4 11 3.5 11287	0.67 NA †† NA †† 1518 109	4 14 4 11504 10	0.64 0.7 0.72 624 12
Random Read (MBps) Sequential Write (MBps) Random Write (MBps) Drive Index Average Access Time (ms) Real World File Transfer Test * Assorted Read (Sec)	NA †† NA †† 2625 110	4 13 7 11866 11	4 11 3.5 11287 11	0.67 NA †† NA †† 1518 109	4 14 4 11504 10	0.64 0.7 0.72 624 12
Random Read (MBps) Sequential Write (MBps) Random Write (MBps) Drive Index Average Access Time (ms) Real World File Transfer Test * Assorted Read (Sec) Sequential Read (Sec)	NA †† NA †† 2625 110 249 312	4 13 7 11866 11 125 38	4 11 3.5 11287 11 148 47	0.67 NA †† NA †† 1518 109 389 372	4 14 4 11504 10 148 44	0.64 0.7 0.72 624 12 229
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Disclaimer: Prices are indicative and are subject to change * Lower the better ** Information was not available during testing † Test failed to run with



this device ++ Not applicable for CD-Writers

performance. Its scores in the synthetic as well as the real world tests were pretty impressive. Although its cost per MB was higher than the other hard drives in the comparison, its performance value cuts through the other drawbacks. If you require a sleek drive



Iomega 20 GB portable hard disk offers USB 2.0 connectivity and comes with a power adapter to fit into Indian power sockets

that is USB 2.0 ready and does not cost a bundle, go for the Freecom FHD-1 20 GB drive.

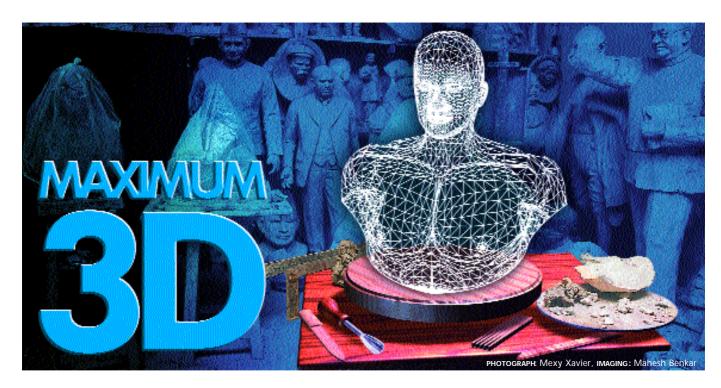
The Best Value Award is taken by the Iomega HDD 20 GB Portable Hard Drive. It weighs only 400 gm and is ideal for those who travel with



The Freecom FHD-1 20 GB drive is sleek yet heavy on performance

their storage device in tow. With 4,200-rpm speed and USB 2.0 connectivity, this is the ideal drive to lug around. The package contents include the IomegaWare CD, the data cables and a power adapter to fit into the Indian power sockets-this is an important inclusion as otherwise this would be a source of inconvenience. Costing about 60 paise for each MB, the drive offers great satisfaction as far as value for your money is concerned. The manufacturers provide a one-year replacement warranty and its attractive price makes it the best value winner. 🗓

YATISH SUVARNA and AHMED SHAIKH



Is the latest version of 3ds max 5 worth migrating to?

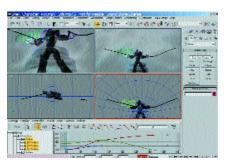
n the nascent Indian graphics industry, 3ds max is used as a stepping stone by all those who aspire to make a mark in this field. It has become a de facto tool, used to introduce beginners to the vast world of 3D modelling and animation. Yet, its great flexibility allows experts to perform incredibly detailed and complex tasks. It can be easily stated that no self-respecting graphics training institute would dare leave 3ds max out of its course, nor would a designer neglect to master it.

Most users would be familiar with 3ds max Release 4, where it attained the peak of its popularity. The question any user who is conversant with earlier editions would ask is: "How far has it come from the previous version?" We decided to take a look at the enhancements of this newly released product and also explore its worthiness.

User interface

In version 5 one can instantly notice the effort taken by the developers to ensure ease of workflow. The change in the interface becomes apparent the moment you start the program-hotkeys on the keyboard allow you to use the program much easier and faster as objects can be manipulated without going through the menu. A new splash screen shows you a randomly chosen tip about default keyboard shortcuts.

The menu has also been revamped. For instance, the Animation menu has all the controllers, hence, applying controls to the objects is faster and simpler than in the previous version (version 4.26), where you had to go to the Motion Panel to assign a control to the object.



3ds max 5 has a new intuitive interface

The menu bar also includes some additions. You can now access Advanced Lightning and Render to Texture from the menu bar itself, which makes the render process faster (the details of this are discussed under 'Lightning and rendering enhancement').

The Isolate function of the previous versions has now been renamed Isolate Selection and is located in the Tools menu. The Snap option is now a part of the toolbar and no longer resides on the Animation bar. This change makes the Snap option easier to access from the menu bar.

In version 5, the most frequently used functions directly reside on the interface, making them easier to access. An example would be the Curve Editor that resides on the Timeline. The Interactive Update option available in this version allows you to preview the changes made to the objects directly; you can also directly assign controls to the object. An all-new Dope Sheet lets you change the timings of an animation without worrying about the animation curve (the path of an animation). You can also copy frames from one object and paste them on another through the time select mode, a feature that will be appreciated by animators.

The Transform gizmos for Position, Rotation and Scale have been redesigned, thus providing more flexibility and feedback: a red, green, blue colour scheme helps you associate the gizmo's components along the XYZ axes; the size of the gizmo changes as it gets closer or farther away from the point of view of the camera; the Scale gizmo now includes plane handles and scaling feedback through stretching of the gizmo itself.

The new Lasso Selection tool allows you to select multiple objects at one go, while the Material Editor has two new options, viz. Ink and Paint for cartoon shading and Translucent Shader which can generate a translucent effect on objects such as leaves. The newly introduced Viewport Manager allows you to use hardware shaders in DirectX mode, which will be helpful in creating content for games.

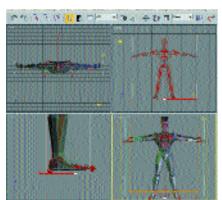
Animation

Animation has always been a tough job in 3ds max and animators invest huge amounts of their time in creating and rendering animations. Version 5 introduces some new and enhanced animation features. Lets begin with Bone Tools, which is a collection of time-saving tools for building and modifying skeletal structures (bones) at any stage. In previous versions, working with bones was a tedious and complicated process. These tools have been made more accessible by placing them under the Character menu.

An all-new function named Skin Pose allows you to pose a particular object in a specific position and rotation (a transform position) and then store that posed state for later use as with the Skin modifier. Skin poses can be used for any object to store its current transforms for later use. For example, you can define a mesh as a character's skin pose and selectively return to that pose at any time during the animation process.

In the previous version, one had to use the Unhide option to detect Low Resolution Objects—a tedious process that can now be easily accomplished through the panel and you need not hide/unhide objects to do so.

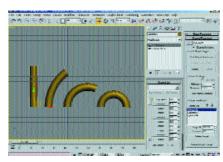
Set Key Animation is a new animation mode, which supports pose-to-pose animation, especially for characters. Unlike in the previous version (4.26), artists can now set keys on only the necessary components of any character or animated object. Hence, animators can now use multiple animation methods



The Skin Pose function makes character animation much simpler

within 3ds max, allowing for a more interactive approach, without worrying about junk or unwanted key frames that generate unexpected results. There is also the Auto Key button, which can be used for generating keys automatically. It is equivalent to the Animate button in previous versions of 3ds max.

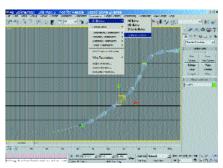
Morphing is commonly used for lip synchronisation and facial expressions on a 3D character, but can also be used to change the shape of any 3D model. The new Morpher Modifier supports Progressive Morphing, which lets you specify intermediate shapes, giving you more control over how the morph interpolation will take place.



Progressive morphing ensures smoother morphing of objects

Splines are object types such as lines, rectangles, circles, ellipses, arcs, stars, text and helixes. The new Spline IK Solver is an Inverse Kinematic (IK) solver that uses a spline as the basis for the shape of an IK chain—it provides a more flexible animation system than other IK solvers.

Spline IK is suitable for animating linked objects such as tails, snakes, tenta-



Spline IK Solver gives you greater control over animating bones

cles and ropes. This solver uses vertices of spline to animate, rather than individual bones. It uses a spline to determine the curvature of a series of bones or other linked objects. Since a spline is a curve, you can apply modifiers to it which allow you greater control over the bones as the vertices can be moved anywhere in 3D space and the linked structure can be shaped in any way.

Just like in the previous version, you can save and merge animation but while the older version only let you merge animations for one particular object, you can now merge an animation that is applied to one object with another. Hence, there is no need to repeat similar animation steps for another object. Moreover, the animation file that is being merged is still editable.

What also makes things easier for the animator is the Flex modifier. It can be used to simulate soft dynamics for an object: a ball falling from a height can thus show a characteristic wobble, making the animation more realistic.

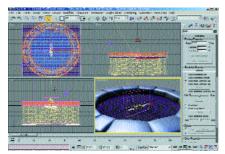
Third-party Extensions to Boost your Productivity

Third-party extensions or plugins are a major source for adding extra modifications to the animation.

Face Station (www.eyematic.com) is a powerful application, which allows you to capture facial animation by capturing facial motion in real time in 3ds max itself. This program is powered by Eyematic's patented facial recognition technology, which quickly identifies facial features on a video stream and tracks them continuously. Thus the facial expressions and lip movements will be precisely reflected on your animated models.

Swift 3D max (www.swift3d.com) enables you to quickly render models and animations to a variety of vector file formats including Macromedia Flash (SWF), EPS, SVG and Adobe Illustrator. This is one of the most versatile vector tools available for designers to create or repurpose 3D content for use with Macromedia's Flash. Thus, you can create amazingly small files while ensuring all the colours, lightning schemes and camera views are kept intact for animations.

If you want more audio tools inside 3ds max, you should consider using FlexSound (www.id8media.com). It allows you to add and layer unlimited number of WAV files to create entirely new composite sounds, which can consist of background noise, music, dialogue or even special effects within 3ds max itself. Once you have loaded the sound files, you can add and edit Flex Keys on the individual files from the Track View to compress or expand sections of the sound file for timing the existing animation.

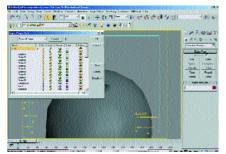


Reactor allows you to add dynamic properties to the object

Reactor, which was sold as a separate program, is now a part of 3ds max 5. A dynamic system now lets you assign physical properties to an object. With so many enhancements, generating animations in this version is less tedious.

Scene management

The inclusion of Layers in this version is an excellent feature that makes it easier to manage the information in your scenes. Layers are like transparencies on which you organise and group different kinds of



Inclusion of Layers has simplified work flow

scene information. The objects you create can have common properties including colour, visibility, renderability and display. An object can inherit these properties from the layer on which you create it.

You can place multiple objects and scene elements on layers with an easy-to-use manager that enables quick revealing/hiding/freezing of scene data. This lets artists keep track of scene data while building 3D elements with Compositing Layers in mind. This feature also intelligently groups scene data, provides commonly used Layering commands and offers the flexibility to render only select objects from a scene, thus reducing the rendering time and the animation file size.

Texturing

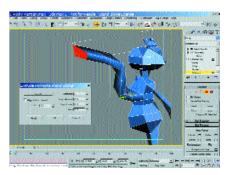
Any object that is assigned a 2D material must have the requisite mapping coordinates that specify how the material is

'mapped' onto the object and whether it is projected as a 'decal', or is tiled or mirrored. Mapping coordinates are also known as UV or UVW coordinates. These letters refer to coordinates in the object's own space, as opposed to the XYZ coordinates that describe the scene as a whole. A re-designed UV unwrap interface puts common tools and tasks at the artist's fingertips. Three Unwrapping types (Flatten, Normal and Unfold) and a slew of selection and navigation tools are now available to make texturing more predictable and easier to manage. A major benefit of this feature is that automatic texture layouts can be created to save time painting textures.

Modelling

Version 5 of 3ds max provides extended polygonal modelling tools, with greater degrees of interactivity and better ways of selecting and managing polygons and selection sets. Building, connecting and extending polygon meshes and their subobject components is a lot easier with these enhancements. The Quick Slice tool allows you to slice objects which previously had to be done manually and the introduction of the Inset function (which was earlier available as a third-party script) allows you to add another polygon over the object for better results when the Mesh Smoother modifier is applied.

A new Modifier called Symmetry now allows you to automatically merge a mirrored object to the original object. The Extrude Along Spline feature permits an extrusion of a selection along the vertices of a spline, due to which an extrude is no longer always perpendicular to the face of a path, as was the case previously.



Polygonal tools allow extruding polygons along a path

Lighting and rendering

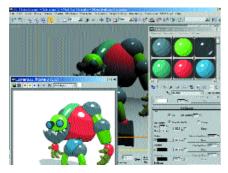
The most painful process an animator faces is the rendering time. The process takes so long that most animators prefer to start the rendering process when they leave office, allowing it to render overnight. In version 5, we see a new feature called Render to Texture, also known as 'texture baking'. This is the process of creating maps of an object's lighting or other elements as they appear in the scene, and then applying them back to the object. This option can save considerable rendering time as the lighting of the static objects' 'baked' textures need not be recalculated. More importantly, rendered textures can be exported to other environments such as game engines. Render to Texture allows artists to build more surface details on their meshes and use low-poly objects to represent high-detail scenes, which is great for games, set designs, and film pre-visualisation.

Light also plays an important role in your scenes. 3ds max 5 has Photometric lights which are similar to standard 3ds max lights, but they use 'energy based computation', instead of the old

Decision Maker									
Bryce 3D		Maya	3ds max 4						
Creating	Final inte-	Hardcore animation	Hardcore animation						
•	0		which involves creation						
modelling	animated	of complex objects with	of complex objects with						
	sequences	the help of a lot of	the help of a lot of modi-						
		modifiers and then ani-	fiers and then animating						
		mating them	them						
Don't	Don't	Upgrade. The	Upgrade. It has several						
upgrade.	upgrade.	rearranged menus, the	enhanced features.						
You don't	Maya is far	new light features, and	Besides, you can						
need the	superior to	inclusion of Reactor and	upgrade to version 5 at a						
sophisticat-	3ds max in	Skin Pose feature	mere 22 per cent						
ed features	terms of	tremendously increases	(approx Rs 32,000 for						
offered by	workflow	productivity	single user license; Rs 57,						
3ds max 5	and ease of		000 for Floating License)						
	use		of its original price if you						
			are a 3ds max 4 user.						
	Creating basic object modelling Don't upgrade. You don't need the sophisticat- ed features offered by	Creating basic object modelling gration of animated sequences Don't upgrade. You don't need the sophisticated features offered by 3ds max 5 Creating Final integration of animated sequences Don't upgrade. Waya is far superior to 3ds max in terms of workflow and ease of	Creating basic object modelling paration of animated sequences proud of the help of a lot of modifiers and then animating them Don't upgrade. You don't need the sophisticated features offered by 3ds max 5 Creating Final inte-Hardcore animation which involves creation of complex objects with the help of a lot of modifiers and then animating them Upgrade. The rearranged menus, the new light features, and inclusion of Reactor and Skin Pose feature tremendously increases productivity						

'intensity based calculation' to accurately generate the intensity, colour, and distribution of lights, making lighting more realistic. Because photometric lights use real-world intensity values, they rely on accurate scaling in a scene. You can also download actual photometric data from lighting manufacturers and easily create real-world lighting in your work.

The advanced lighting support now provided with 3ds max 5 improves the realism of rendered scenes. There are two advanced lighting options. Both of them generate global illumination—illumination that comes from light that bounces off scene objects. Characteristically, global illumination can create colour



Toon Shader will be much appreciated by those who do cartoon animation

'bleeding', where the colour of one object can reflect onto another. Hence, now we have two new advanced lighting options: Light Tracer and Radiosity. When you apply the Light Tracer option, it gives you a natural look to the applied object. On the other hand, Radiosity, which was sold as a separate product, is based on the Lightscape engine and gives you accurate reflections of the light. The only drawback is you cannot preview the object while applying the Light Tracer function and the rendering time is much higher.

New material features include an Ink 'n Paint material for cartoon shading. This allows objects to be rendered with a cartoon look, called Toon Shading. The Toon Shader is a perfect starting point for rendering cartoon-shaded or surrealistic imagery, with specific controls for ink width and consistency, and paint style. Thus, with the inclusion of the new lightning and rendering functions, it is now possible to give your objects the realistic look which was difficult to achieve in the previous versions.

The verdict

It is evident that a lot of pain has been taken by the developers to ensure tremendous increase in productivity for

3ds max 5					A-
Performance	•	•	•	•	
Ease of use	>	•	•	•	•
Value for money	•	•	•	•	•
Features	•	•	•	•)
OVERALL	•	•	•	•	•

Price: Rs 1,41000 (single user license)

Rs 1,66,000 (floating license)

Contact: Discreet Phone: 022-6952000 Fax: 022-6952211

E-mail: raman.madan@autodesk.com

SPECIFICATIONS

Intel or AMD processor at 300 MHz, 256 MB RAM and 300 MB swap space, graphics card supporting 1024x768x16-bit colour, Windows-compliant pointing device (specific optimisation for Microsoft Intellimouse), DVD or CD-ROM drive

professional animators. We see no reason why you should not upgrade to this newer version. However, there is one point of concern: in 3ds max 3 you could open multiple windows in an NT-based operating system, but from version 4 this was suddenly discontinued. Besides, backward compatibility is only extended to the previous released version and not all the prevailing versions.

MITUL MEHTA

1/2 page AD

Bazaar

We test the latest and the best hardware and software products available in the market

AMD Athlon XP 2600+

Pedigree processor

Built using a tweaked Thoroughbred core, this 2.13 GHz processor promises performance equivalent to a 2.6 GHz Pentium 4!



The processor was put to test using MadOnion's Bapco Sysmark 2002 and Business Winstone 2001 to log its data crunching and office application potential. It scored a low index of 169 in the MadOnion's Bapco Sysmark 2002 test that evaluates its performance in day-to-day tasks. A fair comparison would be with the P4 2.53 GHz which scores in excess of 180. Interestingly, the XP 2600+ zoomed past the P4 2.53 GHz in the Business Winstone 2001 test, where it logged an impressive 76.8, a hairbreadth short of the 76.9 logged by the P4 2.8 GHz.

These seemingly contradictory scores can be explained by the fact that Business Winstone 2001 uses older versions of Office applications, while the newer versions used by the Sysmark 2002 suite are slightly optimised for

the P4. In practical terms, most Office applications wouldn't make even a 1 GHz CPU sweat.

Heavy-duty, CPU-intensive video editing and 3D rendering is what poses some challenge to these multi-GHz CPUs. We used the SPECviewPerf 7.0 test suite for the rendering tests and the XP 2600+returned scores to be proud of, beating almost the entire range of P4 processors.

However, on the gaming front, XP 2600+ logged lower frame rates than the P4 processors—in Quake III the P4 2.8 GHz in normal mode scored an amazing 434.2 fps, while the XP 2600+ managed only about 353.2 fps. The difference narrowed down when the game was played at the maximum resolution (1024x768x32)—the 2600+ scored 294.3 fps against the 300 fps logged by the P4 2.8 GHz.

3DMark2001SE is probably the only benchmark where the XP 2600+ comes close to the P4 in gaming performance—it scored a pretty neat 12,095 compared to the 12,595 logged by the P4 2.8 GHz.

Overall, the XP 2600+ is fast and performs almost on par with its specified PR rating. More importantly, it

is comparatively inexpensive. But sadly, it still runs hot (71 degree centigrade CPU core temperature) and the high rpm fans used to cool it are a very noisy solution.

Price: Rs 17,820 Contact: AMD Far East Ltd Phone: 011-6281364 E-mail: rahul.singh@amd.com

SPECIFICATIONS

Thoroughbred core, 2133 MHz core frequency, 266 MHz (133 MHz DDR) default FSB, 0.13 micron processing technology, 128 KB L1 and 256 KB L2 cache, Socket A interface

AMD Athlon	XF	2	60	00-	+ B+
Performance					
Build quality			•	•)
Value for money					•
Features			•	•	\
OVERALL				\	•

MSI KT4 Ultra

The ultra performer

This motherboard is built around the VIA KT400 chipset and is a top contender for the newly launched Athlon XP processor. It supports FireWire (IEEE 1394), Bluetooth, USB 2.0, AGP 8x, Gigabit Ethernet and Serial ATA (SATA) RAID.

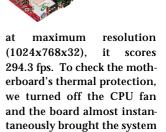
We tested the board with the Athlon XP 2600+ and 256 MB DDR 333 specified RAM. It performed well in all our tests, showing no signs of sluggishness or instability.

The Athlon XP, when paired with this motherboard, zooms past the P4 2.8 GHz in the intensive SPECviewPerf 7.0 tests. The Business Winstone 2001 score of 76.8 is top notch and an index of 169 in MadOnion's Bapco Sysmark 2002 is as fast as the processor can crunch.

The gaming scores were impressive too. In Quake III

Price: Rs 7,850 Contact: Priya Ltd Phone: 022-2663611 Fax: 022-2664154

E-mail: salesbom@priyagroup.com



This motherboard offers unmatched quality and performance and is recommended to all AMD fans and performance enthusiasts!

SPECIFICATIONS

to a halt.

VIA KT400 chipset, supports FireWire, Bluetooth, USB 2.0, AGP 8x, Gigabit Ethernet and Serial ATA (SATA) RAID

SuSE 8.0 Professional

An OS to suite your wallet

If stability is what you crave, then you should consider SuSE 8.0 Professional. This version offers enhanced features and performance. The improvements include KDE 3.0, XWindow and GNOME 1.4.1 RC1, latest kernel 2.4.18

The designation for the property of the proper

SuSE Firewall 2. The new YaST2 includes all the winning features of YaST1

the winning features of YaST1 and incorporates other improvements such as clearer splash and boot screens with a Web-style link menu for installation options.

We tested SuSE 8.0 on a P4 2.0 GHz based PC with 256 MB DDR RAM, a 40 GB Seagate Barracuda drive and



YaST2 Control Center offers a simple interface to manage SuSE 8.0

an MSI MAX2 BLR motherboard. The installation was smooth with no prompting for the partition on which the OS should be installed good for new users but advanced users may find this inconvenient if they have set aside a partition specifically for Linux.

Upon starting, SuSE 8.0 wasn't able to detect the GeForce4 MX 440 graphics card. The RPM for the card is available on the nVidia Web site for this version of SuSE. The network card (Intel Pro10/100) was detected without any problem and the machine was on the network the moment the settings were entered.

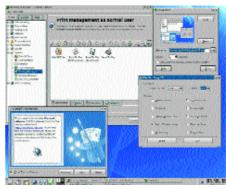
For accessing Windows based machines on the network. SuSE 8.0 provides the Samba 2.2.23a file and print server. However, the network access wasn't as fast as on a Windows machine and there was a slight lag before the folder was displayed. Version 8.0 supports all major protocols such as TCP/IP, IPX, Samba, token ring ARCnet and ham radio. It also has built-in support for DSL, ISDN, PPP Dial-up and DHCP. All this essentially means that you won't need to download any RPM or updates to get the machine on the network or browse the

> Internet through a modem or the LAN. You can even run a Web server using Apache, the default Web server built into SuSE 8.0. You need some amount of expertise to configure it. but if you've been using Linux for a while. this shouldn't be too difficult. The

documentation provided with the OS has scanty information on setting up Apache; more detailed information is available at /usr/local/httpd.

SuSE 8.0 Professional has decent multimedia capabilities. XMMS (X MultiMedia System), a substitute for Winamp, looks similar to Winamp and is easy to operate. The ALSA Mixer is a sound mixer that you can use to create your own sound effects and music. The aRTs is the KDE sound server which lets you listen to MP3 tracks while playing games. Broadcast2000 is a utility that can record and edit audio and video.

StarOffice 5.2, which is capable of opening MS Excel and Word files, comes bundled with SuSE 8.0. The package is a bit heavy on the system and those with an older and slower processor will



The Printing Manager makes it easy to print documents under SuSE 8.0

have to wait for a couple of seconds for the application to open. If you haven't used StarOffice before, it will take some time to understand the icons and their functions. Apart from this, the application works just fine, whether you are creating formulas in a spreadsheet or formatting text in the word processor.

Also included is the Adobe Acrobat Reader 4.0

Price: Rs 3,500
Contact: Seascope Infotech Pvt Ltd
Phone: 022-6338484
Fax: 022-6331074
E-mail: sales@seascope.co.in
Web site: www.suse.com

and KGhostView for viewing PDF files. StarImpress is the application presentation within StarOffice 5.2, whereas StarImage will be useful for those who need an image-editing tool. KMail is the mail application in KDE 3.0. It's easy to set up and apart from the regular feature of sending and receiving mail, it also allows you to define filters to sort your mail. PGP and GnuPG mail encryption is also incorporated in KMail to enhance security.

All in all, SuSE 8.0 has a host of features. Its price makes it a viable and robust solution for enterprise-level users and also for the home user who would not want to

spend extra on features, which are not built into the Windows OS such as an Office suite, a Web server, multimedia players and a sound mixer.

Besides these integrated features, the installation has become very easy and the detail documentation makes

even the new user comfortable with the knity gritty of the Linux OS.

SPECIFICATIONS

8 CDs (including online documentation and three manuals) and one DVD containing the entire application.

Minimum System Requirements: Pentium class processor, 650 MB hard disk space, 32 MB RAM

SuSE 8.0 Profe	B+				
Performance	•	•	•	•	
Ease of use	•	•	•	•	•
Value for money	•	•	•	•)
Features	•	•	•	•	•
OVERALL	•	•	•	•	•

Zenith Portable Desktop

Impressive switchover

At the heart of the Zenith Portable Desktop throbs a P4 1.6 GHz processor and 128 MB of PC266 DDR SDRAM that can be upgraded up to 1

GB. Its 14inch LCD
monitor can
be viewed
clearly even at
a 45-degree
angle. However, the Glidepad buttons
feel tacky and

feel tacky and the keypad buttons too don't give the perfect spring back feel.

The laptop hosts a Mic-in, Audio Out, FireWire (IEEE 1394), a LAN, a modem, S-Video, parallel port and four USB ports. It also has a Kensington lock. At the time of purchase, you can choose from a range of OS such as Windows XP Home, XP Professional or Windows 2000 Professional.

We ran the benchmarks on Windows XP Professional after loading the necessary drivers and found that the laptop provides decent gaming and onboard sound. In Content Creation Winstone 2001, which measures overall performance, it logged 34.5,

Price: Rs 68,500 Contact: Zenith Computers Ltd Phone: 022-8377300

E-mail: mumbai@zenith-india.com **Web site:** www.zenith-india.com

indicating that the performance will be smooth even when running relatively demanding applications such as Photoshop or Dreamweaver.

In SiSoft Sandra 2002 Pro, it scored a high 1817 and 1824 MBps in the ALU and the FPU, respectively. These scores show that CPU

intensive applications
will also run
smoothly. The
laptop logged a

sequential read speed of 20 MBps and a sequential write speed of 17 MBps in the SiSoft Sandra HDD benchmark. The average access time was 12 ms, which is quite comparable with desktop PCs.

Overall, this is a decent mobile replacement for a desktop PC. The only drawback is its weight—3 kg.

SPECIFICATIONS

Pentium 4 1.6 GHz processor (Northwood, 512 KB L2 cache), SiS 650 chipset, 128 MB DDR SDRAM, 14-inch XGA TFT monitor with 1024x768 maximum resolution at 60 Hz, integrated 4x graphics, AVANCE onboard soundcard, onboard 56 K modem, onboard LAN

Zenith Portabl	le I	Des	skt	op	B	
Performance	•	•	•	١		
Build quality	•	•	•	•	•	
Value for money	•	•	•	•	•	
Features	•	•	•	•	•	
OVERALL	•	•	•	•	•	

Hercules 3D Prophet All-In-Wonder 8500 DV

Return of the prophet

The Hercules 3D Prophet 8500 DV is a feature-packed graphics card, at the heart of which is the powerful ATi Radeon 8500 (R200) chipset. It has 64 MB of onboard DDR RAM. But what's more interesting is that, apart from providing a powerful GPU, it also provides a com-



built-in TV Tuner card, video capturing/output features, full hardware DVD decoder and an IEEE 1394 (FireWire) connector. The package includes Ulead Video Studio 5.0, a radio frequency remote control, a USB receiver and an input adapter. This last item can connect up to 10 devices to the card.

As for the card's performance in the tests, it logged 382 fps in the normal mode in *Quake III Arena*. The score at high and maximum settings was 204 and 126, respectively.

Price: Rs 19,950 Contact: Mediatech India Phone: 022-2396696 Fax: 022-6044727

E-mail: sales@mediatechindia.com

It logged 7303 in 3DMark 2001SE, which suggests a good Direct 3D performance.

All in all, this card offers a good multimedia solution.

SPECIFICATIONS

ATI Radeon 8500 (R200) chipset, 64 MB DDR RAM, built-in TV Tuner card, hardware DVD decoder, IEEE1394 connector, Ulead Video Studio 5.0, RF remote control, USB receiver, input adapter that can connect up to 10 devices to the card

Hercules 3D F	В				
Performance	•	•	•	١	
Build quality	•	•	•	•	•
Value for money	•	•	•	•)
Features	•	•	•	•)
OVERALL	•	•	•	•	•

Mercury Wireless Internet Multimedia Keyboard

Connect free!

This is a radio frequency driven keyboard and mouse combination, which can be used within a 2 meter range in any direction and up to 2.5 meters straight.

It incorporates
18 extra function keys for
Multimedia, Internet and programmable functions.

The keyboard uses three AA batteries and has an indicator for the battery status. Ironically, there is no indication for Num Lock, Scroll Lock and Caps Lock, though you can set the bundled program to indicate their status in the System Tray. All the features of the keyboard are available only after you install the drivers bundled with it.

The mouse tends to feel a little heavy because of the two AAA batteries. It can be used at a range of up to 1 meter in any direction and 1.5 meters straight. You can configure

Price: Rs 2,000 Contact: Kobian India Pvt Ltd Phone: 080-5566626 E-mail: rohit@kobian.com three of the five mouse buttons for any function using the drivers provided.

You need to initialise the keyboard and mouse by pressing a small black button placed at the base of the mouse, but this is not mentioned in the manual, nor is there any marking on the device.

If you've been looking for an RF input device, this one comes fairly cheap, but if you're a gamer, you will find the mouse a tad heavy.

SPECIFICATIONS

Keyboard: 2.5 metres range, three AA batteries, standard keyboard, 18 function keys Mouse: 1.5 metre range, two AAA batteries, five buttons

Mercury Wireless Internet Multimedia Keyboard Performance Build quality Value for money Features OVERALL Multimedia Keyboard Nultimedia Keyboard Nultime

Word Perfect Office 2002 Professional Edition

in Word XP. However, when

we tried to open the native

file format of Word Perfect

2002 suite in MS Office XP, it

failed to do so, making this a

setback. Hence, if you create

The other Office suite!

If you are looking for an alternative to Microsoft Office, but one that offers a similar set of features, Corel's Word Perfect Office 2002 is worth a

a file in this suite and send it to a person using Office XP,

look. This Office suite includes Word Perfect 10, Quattro Pro (a spreadsheet package), Corel Presentation 10, Paradox 10 (a database program), Corel Central Day Planner and Corel Central Mail for checking your mail and planning your daily tasks. The package also includes Dragon Naturally Speaking 5 with a special head-set parrot translator that allows for hands-free communication with your PC.

Word Perfect 10 has an Oxford English Dictionary, which takes care of spelling Charting Chart

A time-saving feature in Word Perfect 10 is that it automatically formats text as you type

and grammatical errors. If you need to share your documents, they can be saved in Microsoft Word 2002 format, which will allow you to open a file written in this program

the file will just not open, unless it is saved in a doc format. You can create PDF documents from the program itself. Besides, this version has greater compatibility with HTML, XML and SGML. The 'Format As You Go' feature automatically formats text as you type, thus saving you precious time. Corel Time Real Preview allows you to preview formatting options when you select Fonts, Columns, Underline styles, etc.

Quattro Pro has enhanced charting capabilities. You can

save files in Microsoft Excel 97 format and it has a large workspace consisting of 1 million rows, which is ample for all types of users. The Dynamic **Cross Tab Report** is similar to Pivot Table in Excelit lets you summarise, re-tabulate and re-

organise the data.

Corel Presentation 10 allows you to attach MP3, WMA and animated GIF files to your presentations. Since it also supports Macromedia

Flash, you can publish your files on the Web. The inclusion of Perfect Script and Perfect Expert allows you to create macros, automate repetitive tasks and access Help to guide you through many common tasks.

Paradox 10 simplifies data management just like MS Access. It has plenty of templates that help you organise personal, business and corporate information. It also allows you to publish your reports interactively and through ObjectPAL (a database development language) as WordPerfect, Microsoft Word, or HTML documents, and also in other popular formats.



Corel Presentation 10 allows you to create macros to automate repetitive tasks

The Corel Central program has a built-in e-mail client with support for multiple accounts. It has support for Palm Pilot and also has workgroup scheduling and task delegation features. Another feature is the inclusion of Net2Phone program, which allows you to make calls abroad.

Quick View Plus and Quick Print are bundled with this suite—they save time by letting you preview and print

Price: Rs 32,900 Contact: Trifin Technologies Phone: 011-6226777 Fax: 011-6436447 E-mail: trifin@vsnl.com documents without using the native program. Interestingly, Desktop Application Director, a tool for managing desktop icons of the suite, places the icons in the system tray in the right hand bottom corner instead of the conventional left corner, making it a bit confusing to use in the beginning.

The Corel Application Recovery Manager, is similar to office XP's Apllication Recovery utility, which helps you recover your work in case any of the applications crash.

If you need your files to be secure, Word Perfect Office 2002 provides enhanced security—you can set a password

> for allowing opening of documents in older versions of Word Perfect.

Overall, this is an excellent Office suite, but it lacks the power of Microsoft's Office XP in terms of ease of use and integration with other Office applica-

tions. And it is far more expensive.

SPECIFICATIONS

Minimum System Requirements (with Dragon Naturally Speaking installed): Windows 98/2000/NT 4.0 with SP6 or higher/Me/XP, 64 MB RAM, 300 MB hard disk space (425 MB typical install), CD-ROM drive, VGA monitor, mouse or tablet, 16-bit soundcard or built-in audio input quality equal to or greater than Sound Blaster 16, speakers

Word Perfect 0	Off	ice	20	002	B
Performance	•	•	•	•	,
Ease of use	•	•	•	•	•
Value for money	•	•	١	•	•
Features	•	•	•	•	•
OVERALL	•	•	•	•	•

Ingram Micro Magix

Got no magic

The Ingram Micro Magix is based on an Intel P4 1.5 GHz processor and has 128 MB SDRAM. It is sturdily built and internally the cables are well laid out. Housed



inside a roomy ATX cabinet, there's ample space for adding extra IDE devices. However, there are no bundled applications.

We tested this PC with Windows XP Home Edition. The performance of its core subsystem (CPU, memory, hard drive and the CD-ROM drive) was tested using SiSoft Sandra Pro, where it logged a poor overall score of 16.9. Its extremely low 8.5 fps in *Quake III Arena* (at 1024x 768x32)

Price: Rs 31,200 Contact: Ingram Micro India Pvt Ltd Phone: 0413-274956 Fax: 0413-275387

E-mail: preetha.g@ingrammicro

.co.in

and its failure to run Evolva Bump Mapped demo makes it unsuitable for gaming. It took 27.2 seconds for the Photoshop filter test, proving to be a slow performer in office productivity applications.

This PC comes with a oneyear parts replacement warranty and can be serviced in any of 16 service centres across India. But there is no telephonic support or annual maintenance contract.

Because of its poor showing in our tests, even its low price may not be an advantage as there are better performing PCs available at similar prices.

SPECIFICATIONS

P4 1.5 GHz processor, 128 MB SDRAM, Seagate 40 GB 5,400-rpm Hard disk, Via PM4256 chipset motherboard, PS/2 interface keyboard and mouse, Ingram Micro 15-inch monitor supporting 1024x768 at 60 Hz, Philips 320 watts speakers

Ingram Micro	В-				
Performance	•	•	•	•	
Build quality	•	•	•	•	•
Value for money	•	•	•	•)
Features	•	•	•	•	•
OVFRALI	•	•	•	•	F

TVS Proton

Beautifully strong

If you often need to print small bills or an Excel sheet with just a few columns, you must have felt the pinch of wasting a full A4 size page. The TVS Proton takes care of this-an 80-column dot matrix printer allows you to print on conventional continuous sheet, A4 paper or on paper roll of varying sizes. It has a USB as well as serial interface and therefore, can be used with old DOS-based applications and with the latest OSes such as Windows XP, on which we tested the printer.

The installation was easy



We tested a few sample test documents with a mix-

ture of text in different font sizes and graphics. It managed to print with good clarity; even 6 point text was clearly readable. While printing one of the graphic elements (a circle with straight lines inside), it managed to print the circle clearly but some of the straight lines inside were jagged.

One shortcoming was that it did not have a power switch button. The only way to switch it off is by unplugging the cable or switching

Price: Rs 8,995 Contact: TVS Electronics Ltd Phone: 044-2325506 Fax: 044-23257977

E-mail: careline@esa.tvse.co.in Web site: www.tvsproton.com

off the mains power. There are only two buttons (for form feed and a standby switch) which is a slight handicap when it comes to manageability.

Overall, this printer offers low cost of printing. It has some good features and an excellent build quality.

SPECIFICATIONS

80-column dot matrix printer; supports printing on continuous sheet, A4 paper or on paper roll of varying sizes; USB and serial interface

TVS Proton					B+
Performance	۲	•	•	•	
Build quality	•	•	•)
Value for money	•	•	•	•	•
Features	•	•	•	•)
OVERALL	١	•	•	•	•

Busy Lite 3.0

Light and easy

This is an easy-to-use accounting software. We tested it with Windows Me and XP and the installation was pretty smooth. The interface is simple and easy to understand.

We ran the application at 1024x768 resolution and found that it does not use the full screen, which is a bit cumbersome. The data is created in MDF (MS Access) format and is secured—

you need to provide a password to access the database. However, the software does not specify a minimum password length, which makes it slightly vulnerable.

Busy Lite 3.0 has quite an exhaustive list of features. To make printing cost-effective on a deskjet or a laserjet, it

Price: Rs 68,500 Contact: Zenith Computers Ltd Phone: 022-8377300 E-mail: mumbai@zenithindia.com Web site: www.zenith-

india.com

emulates the character-based DOS print mode. It includes utilities such as a calculator, user-definable warning alarms if your account figures go in

negative sums, a unit converter and yearwise data backup and restore.

You cannot view the balance sheet by specified date or period—it is displayed only for the whole month or the whole year.

The final word: it is comparatively low priced and its user friendliness makes it suitable for small businesses and professionals.

SPECIFICATIONS

25 MB download size, package includes installation CD, user registration card and mouse pad System Requirements: Pentium 200 MHz processor, Windows 95/98 SE/Me/2000/XP/NT, 800x600 monitor resolution

Busy Lite 3.0					В	
Performance	\blacktriangleright	•		•	_	
Ease of use	•	•	•	•	•	
Value for money	•	•	•	•	•	
Features	•	•	•	•	•	
OVERALL	•	•	•	•	•	

In Need of Consoling

Agent 001 takes a peek at the console market and walks away a satisfied gamer

about the birds and the bees, the next revelation to hit you is that 'A thing of beauty can be a pain to behold'. Case in point: the big beige box. As most of us find out sooner or later, the computer is a beautiful gaming machine for sure, right up to the point when you wish to play something on it—like *Grand Theft Auto III*. The game insisted on displaying a garbled mess of popping textures and running colours on my PC—the PC with the GeForce3

Ti200 video card that I had poured five months of savings into, so that I could play the latest games... like *Grand Theft Auto III*. Patches be damned! I was getting sick of this mess and was pondering over the likely course of action to take (introduc-

action to take (introducing my PC to a healthy supply of explosives, crossed my mind more than once) when a friend interrupted my reverie. He asked me to come over to his place to check out his Sony

PlayStation 2. He demonstrated his 'beautiful baby' with the help of 'this really cool game': *Grand Theft Auto III*! Life was trying to tell me something. It was time I listened and set out to check out this whole console scene.

■ If you are into gaming on the move, look no further than the Game Boy Advance.

- The best console to buy would currently be the Sony PlayStation 2. For a cheaper alternative, nothing beats the PSOne.
- As far as possible, make sure that the game titles you purchase are the real deal. Pirated games are an unreliable buy.
- Most consoles are bundled with at least one controller; ensure that you are not short-changed on this aspect.

For those of you who joined in late, here is a brief on the gaming scene in India. The landscape is a desert, with just enough signs of life to keep you heading for the oasis that must surely be nearby. The console market is no different; Sony

e point and third Although S there is en Dreamcast in inal titles a Rs 500 to R more community.

While the state of the st

ILLUSTRATION: Mahesh Benkar

has made some headway into this segment with its PlayStation and now, the PlayStation 2 (PS2). The best selling consoles, however still reside in the era of 8-bit gaming—the Nintendo NES (Nintendo Entertainment System) clones, with libel-attracting names like PolyStation and a price tag that ranges from Rs 200 to Rs 700, depending upon the peripherals that you buy alongside. The games that run on these machines come on cartridges for Rs 30 and above.

As I delved deeper into this underground scene, the PolyStations slowly gave way to more attractive options like the Game Boy Advance (GBA). Thanks to a vividly coloured screen and a bevy of excellent games, the GBA is a pocket-sized haven for the fun-loving types. The console itself sells for around Rs 3,600, while the games, sold on cartridges,

come upwards of Rs 700. But do ensure that the games are the real deal.

Moving on, I half-stumbled over the Sega Dreamcast. This 128-bit console has officially landed on our shores, sells for about Rs 6,500 and has a healthy collection of some excellent titles from Sega and third-party developers alike. Although Sega has ceased production, there is enough stock left to keep the Dreamcast in circulation for a while. Original titles are a rare breed that sell for Rs 500 to Rs 550; the pirated games are more common, selling for as low as Rs 75.

While the Dreamcast is an attractive

ging all the limelight.

The PSOne sells for about Rs 4,000, with games available both officially (priced between Rs 499 and Rs 1,499)

buy, Sony's boys are hog-

and illegally (from
Rs 35 to Rs 50).
The PS2 meanwhile, has the
largest game
library, beautiful
graphics, sports
perhaps the best game
controller, holds a seem-

ingly unassailable lead in the console race and is super-chic to boot. All that at a hefty Rs 18,000! Alas, it is a grey market commodity, and is often sold with a mod chip: something that lets you play illegal or pirated versions of a game. The games themselves come in both the original form (Rs 1,499 and above) and the illegal kind, selling at Rs 80 to Rs 250.

Racing alongside the PS2 is the Nintendo Gamecube and the Microsoft Xbox. While my sources reveal that the Gamecube has been recently sighted in Delhi, it is still a pie-in-the-sky for the most part. The Xbox, however is here to stay—priced at Rs 20,000, also a grey market buy and modded to go, its presently-limited stable of games are sold illegally at around Rs 450.

So which one did I buy? With a humble budget of Rs 5,000, I pocketed the GBA, plus a few games to go. *Grand Theft Auto III* will have to wait.



SIMPUTER IMPLIFIED

Will the brainchild of a small team of educationalists and technologists in Bangalore hold the solu to the Holy Grail of computing for the masses? We take apart the Simputer to see if it has what takes to bridge the Great Digital Divide

n amber sun casts its final rays over sleepy golden fields of mustard. A few wandering cows call out to their chocolate-coloured calves. Lambs skip through meadows under the watchful eye of their pigtailed mistress, the setting sun reflected in her eyes. Under the haystack, her father sits holding something that looks uncannily like a PDA, scribbling in some numbers with a stylus.

Engineers from the Indian Institute of Science (IISc), Bangalore, along with Encore Software Ltd conceptualised the Simputer (derived from the 'Simple Computer'), a Community Digital Assistant (CDA), to send technology to even the most inaccessible rural areas, where it could be used to perform applications as varied as village accounts management, crop budget maintenance and even education. Given the vast number of potential application areas, there are stringent demands placed on its design, construction and usability.

Quite like the PDA, it operates through touch, sound and simple visual icons, dispensing with the keyboard entirely. It incorporates support for Indian dialects and uses special speech processing technology to read the content out. The Simputer is made for multiple users, and individual settings can be retained by each user through the Smart Cards that the device supports. Using a non-proprietary operating system, software for specific applications can be developed for this device quickly.

Under the hood

To face the rigours of rural India and almost constant use, the Simputer uses some of the most proven technologies of mobile computing. It beats with the heart of a 32-bit Intel StrongARM SA-1100 processor, which features a clock speed of 200 MHz and is still low on power consumption. There is 32 MB of DRAM along with either 16 MB or 32 MB of external Flash RAM for permanent storage. It features an integrated 56 K V.90 modem and can be linked to a computer using its USB interface. Finally, it has a 320x240 resolution colour or monochrome LCD touch panel display.

While its specifications are like a cal handheld's, it's interesting ho components have been handpicked t the highest levels of computing po the lowest of prices, while still mainta a rich set of features. On the interface it packs speakers and microphone jac RJ-11 telephone jack, a Smart Card and even an IrDA wireless port. Keer mind the unreliability of our electricit device is powered by three AAA rechargeable batteries. The lack of exstorage is also taken care of by the n ous USB based external Flash device offer capacities ranging from 16 M 1 GB of storage.

Can I Buy One Yet?

Officially unveiled in April 2001, the Simputer is now ready to reach mass-production. Bharat Electronics Limited (BEL), one of the manufacturers of the device, is going to roll out 1,000 units to begin with and in due

course, expand to 5,000 units per month. M.P. Mohammed, BEL's AGM (EM and D&E division) said BEL would manufacture the Simputer based on the specifications given by PicoPeta, which would be targeted at OEMs. PicoPeta is a consortium of technologists and the Simputer Trust, and plans to harness the potential of this device for the benefit of the society.



Besides developing system software bas on Linux under GPL (general public licer PicoPeta will also m the Simputer. Vinay Vishwanathan, Dire of PicoPeta, aims to mote the device as

evolving platform for social change—tially we will target educational institutions and e-governance projects in th country. Once the volumes pick up ar the prices come down from the prese 13,000 and Rs 15,000 for 16 MB and MB, respectively, we will look at retail sales." PicoPeta hopes to sell around 50,000 units this year.



The Simputer runs GNU/Linux operating systems, which coupled with the Perl scripting environment means that applications can be easily written for it. The software has been created keeping the application development cycles in mind, so that the whole process can be worked out quickly and economically. Being an open source platform, it is relatively easy and quick to develop application-specific tasks. The device also features a Web browser, an e-mail client and a host of other applications that further enhance its functionality, especially in rural areas.

One of the most impressive integrated

applications is one called Dhvani, a text-to-speech tool that generates intelligible speech from a phonetic description in virtually any Indian language. It can also convert any UTF-8 text in Hindi or Kannada to this phonetic description and then speak it out with the integrated Phonetics-to-Speech engine. PicoPeta, the developers of the Simputer, claim that given their developmental tools, they can develop front ends for any other language, even non-Indian ones.

The application interface used by the Simputer is based on a variant of the already popular and universally accepted

XML. Known as IML (Inform Markup Language), its main aim is t vide a consistent and lucid front erall users—even those who are illeter uses simple icons and the text-to-s engine and can communicate with in their local language. Therefore, a Simputer, a simple and uniform int is presented for running application

One of the most critical device ensures that the Simputer can be use a variety of applications is the Smar reader. The Smart Card makes the Si er safe for all kinds of transactions, ev financial and banking purposes. It

Simputer vs the World

While the Simputer was conceptualised to serve a completely different purpose compared to the current range of handheld devices from Palm, Compaq and Psion, this comparison table highlights the differences in features and physical characteristics of the Simputer vis-a-vis other handhelds

	Simputer	Palm m105	Compaq iPAQ H3850	Psion Series 5MX
Processor	32-bit Intel Strong-	32-bit Intel Strong-	32-bit Intel Strong-	ARM710T RISC
	ARM SA-1110 at	ARM SA-1110 at	ARM SA-1110 at	CPU at 36 MHz
	206 MHz	206 MHz	206 MHz	
RAM	16 to 64 MB	8 MB	IB 64 MB	
ROM	8 to 32 MB	2 MB	32 MB	8 MB
Screen	240x320	160x160	240x320	640x240
resolution				
Screen type	Colour/Mono-	Monochrome LCD	Transflective TFT, 64 K	16-level greyscale
	chrome LCD		colours	LCD
Dimensions	6x3.75x19 inches	4.65x3.11x0.7 inches	5.3x3.3x0.62 inches	6.7x3.5x0.9inches
Weight	250 gm	125 gm	185 gm	355 gm
Operating	Linux Kernel 2.4.18	Palm OS 3.5	Microsoft Pocket PC	EPOC (32-bit multi-
system			2002	tasking)
Connectivity	USB, IrDA, Modem,	Infrared, Serial	USB, Serial, Infrared	Serial, Infrared
	Smart Card			
Price (approx)	Rs 13,000 to	Rs 9,625	Rs 33,500	Rs 8,750
	15,000			

user profiles, applications and settings, so different groups with individual Smart Cards can use a single Simputer.

Forward march

The Simputer is built in the image of a personal computer and can be used in varied sectors. It can be used for e-governance where the Smart Card stores information

Vinay Deshpande
ENCORE SOFTWARE LTD

Poor or no use of technology in the rural market can be exploited with a certain degree of innovation

regarding voter registration, ration distribution, survey and census data, education and even health care. For rural banking, Smart Cards can be used as digital passbooks, for synchronisation of transaction details between agents. One of the most prolific uses of this device could be in the field of education where it can be used as a mobile kiosk for teaching languages, reading and writing—and this is further extended, given its multimedia capabilities. Newer courseware and training modules can be downloaded into its memory

and updated on a regular basis. In addition, the e-mail and Internet access capabilities make it a cheap and efficient route of communication.

The frontiers that the Simputer opens are immense. Besides the obvious advantages of communication and education, traders and farmers can also find out the newest prices of goods, keep stock of their

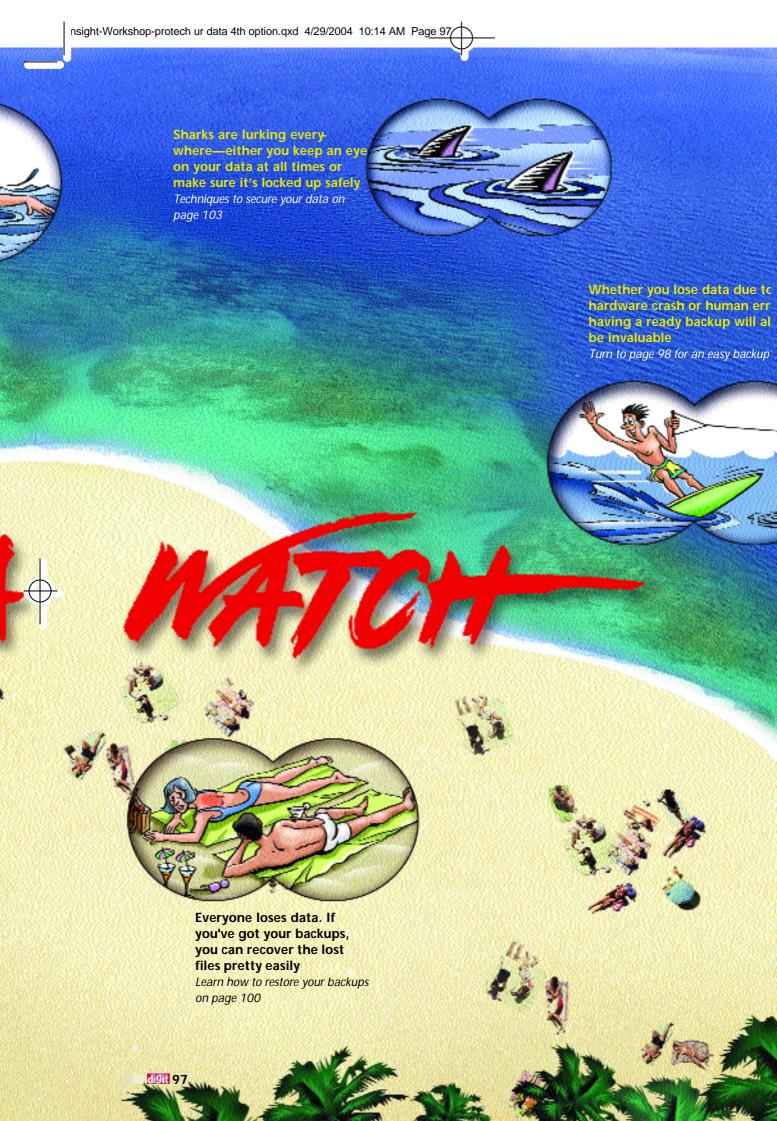
on bank loans and schemes, and maintain records of their harvest cycles and yields. The barter system, still practiced in some places, can be digitised and converted into a regularised format with secure transactions using the Smart Card support. With the ability to take on external storage, this device can hold additional

information such as remote healthcare assistance and information, health schedules and administration of vaccines, advice on livestock and farming practices, etc. Last but not the least, with its multimedia capabilities, it can also be used as a mobile entertainment device.

With such a vast array of applications at such ease and affordability, the Simputer, when mass produced, may just find itself in places where clean drinking water hasn't reached yet.

MARCO D'SOUZA

Www.thi



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Safety first

The high reliability of modern hardware makes backups seem pointless, but there is no shortage of reasons for data loss—viruses, hardware failures, software errors, carelessness or plain bad luck. There is no surefire way of preventing an accident, so taking backups religiously might just save the day. If you don't back up, you will learn its value the hard way.

Think of how easy life can become if you maintain regular backups. Should you lose your data, all you have to do is launch the backup software and hit restore! Depending on how often you take backups, the copy could be as recent as a few changes old.

There are some cardinal rules of taking backups.
Back up everything you can

fit into your budget—the more you back up, the less time you will have to spend redoing. Check the integrity of your data; mirroring corrupted data is obviously useless. Test the backups regularly—the backup media could wear out over time, or the backup files may get corrupted if the backup process is interrupted.

Take backups as frequently as the data changes. Some data files need to be backed up more frequently than others, but for any changes that you can't redo, back up at least once a day. Maintain more than one backup if your budget allows it and keep them in different places-this protects the backup media from physical damage. Retain some old backups-this will come in handy if a newer copy gets corrupted. Depending on the volume and type of data, this could be anything from a couple of weeks to a few months old. Finally, make sure your backups are as secure as your original data. This applies to work environments as well as at home-if there's something you don't want others to see, they should not be able to get hold of it from your backups.

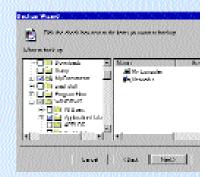
Before you start taking backups, identify what to back up. For businesses there is a simple answer-everything. In a networked environment, a virus can wreak havoc with entire departments. When every minute of computer downtime can be measured in money, a backup system is a safety net you can't ignore. Of course, this level of backup may be overkill for most individuals and small businesses. You should still try to back up anything that you can't otherwise replace. This eliminates Windows and most application programs. While reinstalling and reconfiguring these can be a long and arduous job (see Digit, October 2002, 'For a painless reinstall), their loss is not irrecoverable.

Of all the data on your hard disk (some hiding in places you wouldn't expect) what you choose to back up depends on the amount of space you have of backup media and its importance to Organise all your files in one top folder, such as My Documents. Thi reduce the effort needed to hunt do the data you need to back up. You sl also look at data files of other applica such as Internet Explorer Favorites, boxes, etc.

Using Microsoft Backup

You don't need to look far for ba software. Microsoft Backup is a free that comes with Windows 98. If you already have it installed, open Contro > Add/Remove Programs > Windows . Select System Tools and click De Check the box next to Backup an your way through the dialog b Microsoft Backup is a scaled-down vo of Seagate's Backup Exec. It supports ing up to SCSI and IDE devices su tape drives and CDs and to ne shared folders on another compu can compress backups, reducing space requirements and verify the integrity after it's done. It supports incremental and differential backup

On launching the software (Start grams > Accessories > System Tools > Ba it presents you with three choices. 'Create a New Backup Job' and follo wizard. If you want to choose whicl



Choose the files and folders you want to backup



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Take more control of your backups

or folders to take backups of, select this option. You will see an Explorer-like window where you can tick the files and folders you want to mirror.

Once you have selected all the files, click Next and choose whether you want a complete ('All selected files') or incremental ('New and changed files') backup. If this is the first backup, choose the former. Next, select where you want the backup and save

the job. The next step gives you the option to compress the backup and verify it for integrity after it is complete. Save the job and click Start to start the backup. You will be notified when the operation is complete and if there are any errors while taking the backup. The next time you run Backup, choose to make incremental backups.

If you do not click Start, but simply save the job, you can configure a lot more options for it before running it. Click the Options button on the main Backup window. On the General tab, you can choose the kind of compression to be used and whether

the backup should be overwritten if it already exists. Under the Password tab, you can set a password for the backup file.

Under the Type tab, you can select

whether the backup should be Full, Incremental or Differential. If you select Full Backup, every single file from the source is copied to the destination. With Incremental Backup, only the files that have changed (those that have the archive attribute on) since the most recent backup are copied and the archive attributes are turned off. If you select Differential Backup, all files that have changed since the last full backup are copied, but the archive attributes are left on.

Under Exclude, you can specify certain types of files (for example, .tmp) to not be copied. You can select reporting options under the Report tab.

Using SecurDat

In Microsoft Backup that is included with Windows 98, there are no options for automatic backups. But there are several other software, some of which are free (see box, 'Backup Utilities'). One application worth mentioning is SecureDat, which



Continuously monitor folders to backup changed files with SecureDat

quietly runs in the system tray and monitors specific folders. Every time a file changes, it takes a backup, ensuring that you always have the latest backups. It

Backup Utilities

There are numerous backup software that work at different scales and man backups in different ways. Small office and home users can make do with fre software that simply copy files to a dil ferent location. Large businesses usually have complete backup management solutions that work with several servers and hundreds of tapes. SecureDat

www.pa-soft.com

SecureDat monitors specified directories and automatically makes several backups of files, whenever the files are modified. This is particularly important i you work with several files and often modify some of them. It also allows compression and encryption, making it an ideal backup solution for most users.

BackupGenie

www.backupgenie.fr.st

BackupGenie is a free utility that can I easily configured to backup many fold ers and subfolders at specific frequencies and maintain several versions. It takes backups in a standard Zip forma Additionally, there are options that send backup files via e-mail or FTP. Yo can also launch a program such as a scanner after the backup is complete.

No Hands Backup

http://hem.spray.se/anders.peterson/

No Hands Backup simply copies files the source directory to the backup di tory, maintaining the folder structures careful though—in its efforts to main an exact mirror, it also deletes files an folders from the backup that have bee deleted in the source directory.

Backup Easy

www.liquid2k.com/hinx/

Backup Easy is a free, cross-platform u that takes backups of directories and a designated directory automatically, according to selected weekdays and t

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Managing Backups

Once you start taking backups on a regular basis, the multiple copies become confusing to manage and deciding on a rotation scheme to reuse the backup media is essential. Several backup strategies have evolved over the years. The simplest scheme is to have two or more media—hard disks or CDs-and rotate them every day. For example, if you have two CD-RWs, you could use CD1 on Monday, CD2 on Tuesday, again CD1 on Wednesday, and so on. This is fine if you don't have much data, but doing a full backup everyday of hundreds of megabytes of data (on a 10 GB+ hard disk) gets tedious. Also, if you do this, you don't have any backups older than a day. If your files got infected by a virus a week ago, you wouldn't be able to use any of your backups.

A commonly used scheme called the Grandfather-Father-Son scheme is efficient and easy to implement. Here, you maintain three levels of backup files. This uses many more CDs, but is a good compromise between reliability and speed. To illustrate this strategy, let's work with a period of three months, where you take backups six days a week (Monday to Saturday). Thus, you would have a separate hard disk just for taking backups, where you would take daily incremental backups. Every weekend, you would take a full backup on a CD-RW. Maintain at least two such CD-RWs, though it would be better to have four, one for each week of the month and reuse the discs every month instead of every fortnight. Finally, you would take a full backup every month on a CD-R, which will last you for a very long time.

With professional backup software such as Veritas Backup Exec (www.veritas.com), such strategies can be fully automated. For home users and smaller organisations, it is not too tedious to do this manually, since the quantum of data would also be comparably very less.

maintains several versions of the backups, making it very useful when working with important documents. The software may detect even a corrupted file as a modified one and take a backup, but you can always amend that by using an earlier backup.

Once you run SecureDat, click File > New entry and select the folder to be monitored under the Source tab. Choose to include subfolders if you want. Under the Target tab, click 'Other backup directory' and select where the files should be mirrored. Under Options you can set how many versions of the backups to maintain and on what criteria the backups should be made. You can enable encryption for security and compression for space under the Advanced tab.

Lifeboat or rubber tube?

When taking backups, the kind of media you choose is very important. You would want a storage solution that can be relied on for many years. How you choose your media depends on the amount of data you need to backup, its importance and of course, your budget.

Every media type has dramatically different characteristics such as life span, storage capacity, re-usability and cost. Tape drives are the standard in the back-up systems of many businesses. Tapes offer extremely high capacities, average data transfer rates, and a reasonable life span, but allow only sequential access to data.

For small businesses or home users, hard disks, CD-Rs, CD-RWs and even DVD-Rs would be a more viable backup option. The real advantage of a CD-Rs, CD-RWs and DVD-Rs is their long life spans—if maintained well, these are estimated to last as long as 30 years before oxidation starts affecting them.

Another option is to use removable drives. Zip drives and other external storage solutions (see, 'Walking Gigabytes' on page

72) have become quite popular in years. However, these media do no extremely high levels of reliability a best suited for shuttling data between tions, occasional ad-hoc backups a short-term storage.

For an optimum balance betwee and performance, you should use a bination of storage solutions for dif kinds of backups (see box, 'Managing ups'). Thus, you can use a hard di daily backups, CD-RWs for weekly ups and CD-Rs for monthly backups can even use just a hard disk for all ups. It's prudent to keep the origina the backups in different places, in ca hard disk fails and you lose both.



Jumping back

As with backups, ther are a few cardinal ru to restoring, too. One of rules of taking backups i check the integrity of ea backup on a regular basi If you do not do this regularly, you could be in for shock when you need to restore some files. As wir your primary storage me backup media can also g corrupted—CD-Rs can ge scratched, hard disks ma







crash and the backup software may fail while mirroring the files.

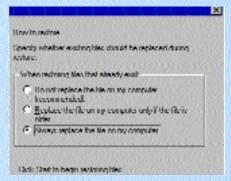
There are ways to recover deleted files, formatted disks and, sometimes, data from failed disks (see section, 'Back from the grave'). Of course, this depends on how important the data is and how recent the backup is. Next, you should ensure that your restore media is intact, too. There's no point restoring to a failing hard disk or one that has potentially bad sectors. If you are sure about the reliability of your backup and restore media, proceed with retrieving the files.

Restoring Microsoft Backup files

If you take backups using Microsoft Backup, here's how to go about restoring your files. Unless you've turned the option off, the software will present you with three choices when launched. Select 'Restore backed up files' and click OK. If you had earlier turned off this option, click Tools > Restore Wizard. On the next screen, choose the file or tape drive you want to restore from. On clicking Next, Backup will show the backup sets on the media, along with the date and time of the backup, and you can select the one you want restored. Click OK and you will see the tree structure of where the files were mirrored



Select the files you want to restore



Choose how the files should be restored

from, in an Explorer-like view. Just like with backups, you can tick off the files or folders you want to restore. Click Next and Backup will ask you where you want to restore the files. You can choose Original Location if you are sure that the original files here are irrecoverable and the media is reliable. Otherwise, you can restore them to an alternate location. On the next screen, the wizard will ask you what it should do if it already finds the same files in the restore location. If you are sure that those files are corrupted or not useful, select 'Always replace the file on my computer'. This will ensure that all files will be from the backup set only. Next, you will be shown a warning that the backup media is required to be able to complete the restore operation. Just click OK and then Start to restore the files. You will be notified when the operation is complete.

Restoring SecureDat backups

If you use SecureDat to take backups, you can restore your data by clicking the Restore icon on the toolbar. The software will display a complete list of all versions of the backups, along with the time and date stamp, the original folder and the backup file name. If this list gets too large, you can filter it using one of the filter options available. Just select the

files you want to restore and Restore. You can also delete files fro backups. If you did not enable cor sion or encryption when taking the ups, you can simply browse to the r folder from Windows Explorer and the relevant backup files to wher want them restored.



Back from the grave

Despite all precautions important files sometimes do manage to find their way out of your read Data could be accidentally intentionally deleted, may you forgot to copy some important information before formating your had disk, or maybe the files ar lost due to hardware failt or a virus.

If you can figure out how the file got lost, it become easier to recover. Remember however, that file recover especially without profess all help, is almost never guanteed and success depenon a number of factors.

4

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Recovery Tools

GetDataBack

www.runtime.ora

GetDataBack helps recover data when your drive's partition table, boot record, FAT or root directory is corrupt or lost due to viruses, power failure or by accidental deletion. It may even recover data when the drive is no longer recognised by the OS or when all directory information is lost. Its main advantage is that it runs in a read-only mode, which means the program will never attempt to write to the drive you are about to recover.

Active Partition Recovery

www.partition-recovery.com

Active Partition Recovery is a DOS tool that helps recover deleted partitions and logical drives by restoring the information from a backup of the Master Boot Record, partition tables and boot sectors.

Stellar Phoenix Data Recovery Software www.stellarinfo.com

Stellar Phoenix analyses and recovers data from inaccessible disks that have been corrupted by virus attacks and accidental formats. It supports FAT16 and FAT32 file systems and has been known to have high success rates.

Zero Assumption Recovery

www.z-a-recoverv.com

This tool extracts data from damaged hard disks. It works from within Windows and can recover files from FAT16, FAT32 and NTFS partitions. It supports long filenames and NTFS compression.

PC Inspector File Recovery www.convar.com

This data recovery program supports the FAT12, FAT16, FAT32 and NTFS file systems. It's one of the few free file recovery software.

FILERECOVERY for Windows

www.lc-tech.com

This software can undelete accidentally deleted files from various file systems under Windows. It can be run from a floppy to avoid overwriting any files on the hard disk.

Hard disks store data in sectors and clusters. Think of sectors and clusters as a hotel with floors and rooms. The guest list is stored at the reception and any one at the desk is able to tell you the room in which a particular guest is staying. Hard disks store information about each file in a similar way. The 'address' of each file is stored in a separate area of the hard disk that is not accessible with common tools. When a file is requested, the disk looks up this 'register', locates the file and passes it on. On FAT and FAT32 partitions, this entry is stored in the FAT (File Allocation Table).

When a file is 'permanently' deleted, only its entry from this 'register' is removed. The actual file is still stored on the disk until some program requires space to write to. Thus, it may still be possible to recover the file.

The sooner you realise that a required file has been deleted, the better. The further you need to go back in time, the more luck you need. Basically, the more the hard disk is used, the less the chances of recovery, since the probability of the clusters being overwritten with fresh data is higher.

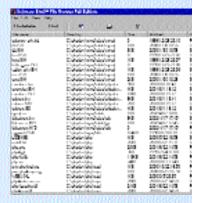
The nature of the applications you use determines how the application modifies the registry or uses dependant files. A browser, for example, is the worst enemy of data recovery-it saves hundreds of files as cache, tremendously increasing the probability of clusters being overwritten. E-mail is a much lesser cause for fear-as you download e-mail, only a few kilobytes would be used up every time. A word processor doesn't write to any dependant files, but if any application settings are changed, it would modify the registry. If the registry size increases because of this, it may look for a free cluster to write to.

Another criteria for higher chances of successful recovery is the location of your stored data, again amounting to how the hard disk is used. For example, if all your applications and Windows are on drive C,

the Windows swap file is also on the drive and all your data (including e browser favourites, etc.) is on dri chances of recovery would be the hi because no program is transparently ing to drive D.

Recovering lost files

The minute you realise that you wa recover a file, stop using the PC—c close any programs, shut down Win hit [Ctrl] + [S] or even chat. You don' any application to write anything hard disk. Then, take a step back an out exactly how you want to go recovering the file. Usually, there room for experimenting. Also, recovering files, save them on a drive than the one you are recovering f you don't want any data to be writ the drive until you finish recovering



File Rescue displays a list of deleted files their condition

There are several tools availabl can help you recover the lost file(s Rescue (www.softwareshelf.com) is a sma useful tool that works with FAT, I and NTFS drives. When you launch program, it asks you for the drives t and what kind of files to look for. your selections and click OK. It sca disk and shows up a list of files t



finds on the disk, but not in the FAT. It also shows the chances of recovery. If it says Poor, it means that some parts of the file have been overwritten and will not be recovered correctly. If the condition is stated as Good, the file will be recovered correctly in most cases. Select the files you want to recover and click Undelete.

If your hard disk got formatted accidentally or you realise later that you need some data from it, the chances of recovering the data would be much lesser, but not impossible. A Quick Format affords a higher chance of recovery than a Full Format.

Easy Recovery from Ontrack (www.ontrack.com) is a very good software for recovering from such disasters. Using Easy Recovery is pretty simple. The software starts with a wizard that guides you through the data recovery steps. Click Next and the disks on the computer and partitions on them will be listed. Select the partition that you want to recover files from and click Next. You will now get a confirmation of your selection and you can optionally click Advanced to further configure the software. On clicking Next, the software will start scanning the drive for deleted files and list them in an Explorerlike interface. Check the ones you want to recover, select a destination folder and click Next. You will be notified when all files are recovered.



Easy Recovery displays deleted files that can be recovered

As we have seen, using Easy Recovery is pretty simple, but it runs under Windows. If your hard disk fails, you can attach it to another Windows machine to recover data, but this may not always be possible. The software allows you to make floppy disks with the software, so that it can also be run without Windows. Just boot from a Windows Startup Disk and run the software. This means that you should have the disk handy though-as with backups, create these floppies before disaster strikes and check them often for integrity.



Secure your data

hieves are everywhere. It's not just your money they may be after. Your business plans, profit projects, even your address book can mean a lot to some people. Recent worms have been known to send out lists of e-mail addresses to the developers who use them to send out spam. Also, pranksters and viruses can potentially destroy all your data. It becomes very important to lock up your data away from the reach of others.

Encryption

Encryption involves scrambling of d that it becomes indecipherable unt unscrambled again. Simply put, it breaking a picture into a huge jigsav zle—as long as the pieces are scatte is impossible to figure out what th ture is. You can do the same with a documents and communication, someone should get a hold of you it would be useless they can decryp

Cryptography enables you to sensitive information or transmit it public, open, insecure networks so cannot be read by anyone excep intended recipient. One of the sir encryption systems was developed | Roman emperor Julius Caesar about years ago. The cipher involved rep the alphabets in the original text by that are a fixed number of places aw example, A would be substituted b by E, and so on. Hence the word ' would be encrypted to 'vhfuhw'. A most basic level, this is what encry involves. Over the years, very encryption algorithms have been oped and many of them are in use Encryption can become a very adv topic if you want to learn about all t ferent kinds of encryption and how work. We can safely leap to just using

Encrypting your data

We will use a free software called (Pretty Good Privacy, www.pgpi.or encrypting files and e-mail. PGP is k to provide very secure encryption widely used across the globe. During be sure to select the plugin for you client. On installing the program, tl Generation Wizard will guide you th making a private key. This will be u encrypt your e-mail. Enter your nan e-mail address, a passphrase (passwo the key, and the key will be generat

The way the public key algo

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Secrets to a Good Password

Any level of encryption is useless unless secured by a strong key. The following guides may seem like common sense, but very few remember to adhere to them.

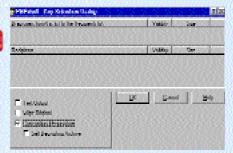
Firstly, don't stick your password on your monitor and don't give it out to anyone else, no matter how much you trust them. You then need a password that is difficult to guess or crack. The best passwords are a combination of eight or more upper and lower case letters, numbers and symbols. Don't choose a common phrase and never use the same password as your login. Most fraud cases are inside jobs, so names and birth dates of loved ones are out as well.

Apart from names, nicknames and dates, the most commonly used passwords are god, sex, password, angel, trustme, one's address or hometown and complicated-looking, but easy-to-remember key combinations such as z1x2c3v4. The characters may be upper or lower case, but don't use any of these for passwords.

It is also important to vary your passwords. Having the same password for everything is dangerous—if one password is discovered, all your files and accounts are at risk. Also, change your passwords on a regular basis, but don't use a standard policy to build your passwords—change the strategy too.

Passwords are normally cracked in three ways. The most common is guessing. Names, or combinations of names and important dates have often given way past all security schemes. Second is a dictionary attack, where words and word combinations from a dictionary of commonly used names and words end up forming the right password. Thus, don't use common words and phrases. Lastly, the brute force attack tries every possible combination of letters, numbers and symbols to find the right password. The more complicated the password, the longer it will take to crack. In fact, some good passwords have been estimated to take years to crack on very highend systems.

A computer-generated random password is usually very good, but difficult to remember. There are several software available that can maintain password lists in an encrypted file, so you would need to remember just the password to access this list.



Encrypting files on your PC using PGP

works, keeping your key to yourself is of no use. Those who need to send you secure messages need to use your public key to encrypt the message. Run PGPKeys from the PGP system tray icon, right-click your key and click Export. It will be saved as an ASC file and can be distributed to others. Be careful to never send out your private key. Similarly, to be able to send secure messages, you will need the recipients' public keys. Import the key from PGPKeys and you are ready to send encrypted messages. When using Outlook or Outlook Express, click Tools > Encrypt using PGP.

To encrypt files, right-click the file in Windows Explorer and click *PGP* > *Encrypt*. PGP will bring up a window where you can set encryption parameters. Choose Conventional Encryption and click OK. You will be asked for a passphrase for encrypting the file, after which the file will be secured. The file can also be decrypted by right-clicking from Windows Explorer.

Don't let the bugs bite

Viruses can wipe out all data on your PC or corrupt the files internally, making recovery impossible. In a networked environment, they can be even more dangerous.

Anti-virus software are aplenty today and many are very effective in controlling deadly viruses. When choosing an anti-virus software, your primary concern should be effectiveness. It should be able to reliably trap all known viruses and prevent them from infecting your files and applications. It should also transparently monitor all activity on your computer and check every new file that's coming in. A good virus scanner understands the nature of viruses and prevents not only known viruses, but also identifies viral behaviour so that it can detect new, as yet unknown viruses.

Finally, the software vendor should provide regular updates for new viruses. This is critical to securing your system as new viruses are being let loose every day. Alerts of new viruses via e-mail is an added bonus—there is always some tim between the time the virus is release a cure is developed. If the vendor ca you of the virus beforehand with t avoiding it, you can secure your accordingly. Ensure that the anti software is always running and mc ing your system. With the increase etration of the Internet, and the cha nature and attack methods of viruse is very important.

AVG Anti-Virus (www.grisoft.con pretty good free virus scanner. It co ously monitors all disks and even en that your e-mail is safe. The devel also provide regular updates that you download from their Web site.

Great walls of fire

A standard advice from profession the highest possible security is to no nect your PC to any network, even Internet, and never share any files! It too extreme and unpractical, but it highlight the fact that as long as y connected, you are vulnerable to v and hackers. Just like you use an anti software to prevent viruses, you can firewall for monitoring network tra

At the most basic level, a firewa arates an untrusted network such Internet from a trusted network of your PC. The firewall works like a tionist who directs visitors to the opeople and makes sure that intrude not hinder the work. A good firewal analyse all network traffic and allow authorised data to pass through. Als firewall itself must be immune to tration. It may also log network inftion for user analysis.

Many types of firewalls exist as software and hardware. Hardware walls are usually implemented in organisations. Software firewalls fur just like proxy servers, but instead oply connecting networks, they analyse the data packets passing thr their origin as well as the intended nation. These firewalls also provide detailed reports than hardware fire

Firewalls can prevent Denial of S (DoS) attacks to your PC or net Though it is fairly easy for prankst find out your IP address (this is eve ier on broadband connections where could have fixed IPs) and send of attack, most such attacks are a restrandom practices, without any part machine in mind. On an unprotected tem, a DoS attack can freeze the OS,

severe lagging of the Internet connection, and will force you to restart Windows at the risk of losing unsaved data.

To exploit weaknesses on your system, a hacker first has to learn what software you run. Data is exchanged from your PC through ports. Figuring out which ports are open and what kind of data they accept gives a good clue about your system. Port scanners are often used by attackers to find out whether a backdoor is running and if it accepts connections to your system. Firewalls close and lock ports that are not required and open them only when required. Hence, with a firewall running, it becomes difficult for a cracker to fingerprint your system.

Many users suffer due to backdoors. These software accept connections and allow anyone to take complete control of your system and all your data. Backdoors are difficult to detect unless their nature is already known, and firewalls can help by blocking all ports except those specifically opened for trusted applications.

Using Tiny Personal Firewall

Firewalls are available at varying prices, some even free. Lets have a look at how to install and configure Tiny Personal Firewall (TPF, www.tinysoftware.com), a firewall that doesn't hog system resources and runs quite fast. Installation and configuration is also fairly straightforward and the level of protection is appreciable.

Upon installation, TPF will be active and will scan your PC for potential weaknesses and existing Trojans. With default settings, the firewall is set to medium security with pre-set filter rules. The firewall will throw dozens of alerts the first few times it runs, to learn what network transactions to allow and what to block. The more network applications you run, the more alerts you'll see until TPF has built its database of allow and deny rules.

Backup Genie 1.5, No Hands
Backup 2.0, SecurDat 2.1
Pro, Active@ Partition Recovery, FILERECOVERY for Windows, GetDataBack for FAT,
PC Inspector File Recovery, Stellar Phoenix
8.0 Data Recovery Software, Zero Assumption Recovery, AdvaCrypt Suite 3 3.40s,
Crypto-Lock 2.01, DPcrypto 1.05, PGP
7.03, Agnitum Outpost Firewall, Sygate
Personal Firewall 5.0.1137, Tiny Personal
Firewall 2.0.15
Find them on the Mindware CD

When prompted, check the option to create the appropriate rule and click Permit to allow the connection.

When you run TPF with the Internet connection on for the first time, you should disable all the Internet software. This way, you can identify any software



Allow only connections that you authorise

that tries to automatically connect from your computer without your knowledge. Start each program one by one, and allow each one as it tries to connect to the Net. It is a better practice to wait till the software reports a connection failure, and then re-attempt connecting after granting it access. This way, you increase the chances of preventing spyware from sending data out from your machine.

Right-click the TPF icon in the system tray and click Firewall Administration to enable or disable the firewall and access advanced configuration options. You can add or delete trusted address groups and set up filter rules. A filter rule lets you define the protocols (UDP, HTTP, etc) used, the ports through which access should be allowed, the applications allowed and when the rule should be valid. TPF also displays a dynamic list of open connections.

Permanent Internet access through cable and optical fibre connections are on the rise. It is very important that you use a firewall on such connections, as the PC is almost always on the same IP address. If you are not using the Net connection when the PC is connected, you can set the firewall to shut off all Internet transfer.

There are a number of ways you could lose data—through accidental deletion, hardware failure or malicious intent. But if you've backed up important data and secured it the correct way, you'll never face a data disaster.

VEER KOTHARI

Encryption Tools

Crypto-Lock

www.rtsoftware.org

Crypto-Lock is a free file encryption prog The password you enter for encryption is stored within the file, but undergoes var processes to prevent it from being crack Also, even if you use the same password every file, random values are used for ear making it that much more difficult to cra

AdvaCrypt Suite

www.advacrypt.cjb.net

AdvaCrypt Suite is a strong encryption cation. The software supports all Windversions and is free for personal use.

DPcrypto

www.dpaehl.de

This is a high security encryption progthat supports several encryption algori This program is giftware—you can ma donation to the developer or offer to t late it to other language.

Anti-virus Tools

F-Secure Anti-Virus

www.f-secure.com

F-Secure Anti-Virus regularly download anti-virus definitions transparently and available in several versions for home u and corporate networks. For offices, th porate version allows management of anti-virus across the network from a ce server, a very useful feature for adminitors. You can also sign up to receive resecurity alerts from the F-Secure team.

Norton AntiVirus

www.symantec.com

Norton AntiVirus provides reliable prot against application viruses of various ki document viruses and even e-mail wor Security alerts from the Symantec task keeps you abreast with the latest breac

Firewalls

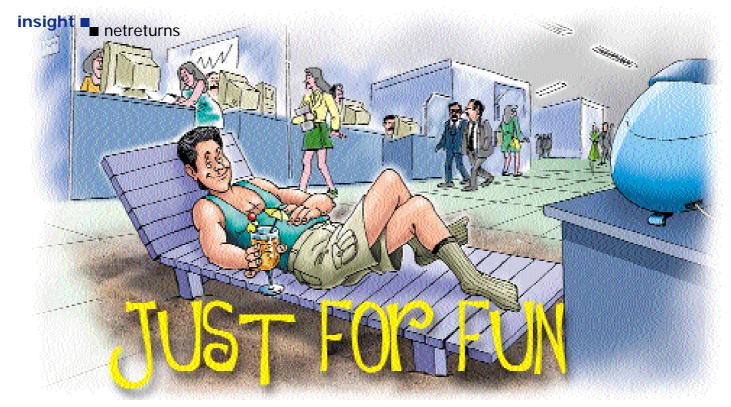
Sygate Personal Firewall www.sygate.com

Free for personal use, Sygate Personal wall is pretty good at protecting your I from hackers, Trojans and DoS attacks. creates detailed logs of network traffic keeps information on your PC safe and private.

Agnitum Outpost Firewall www.agnitum.com

A personal firewall for Windows, Outpot Firewall prevents threats from cookies, banner ads, e-mail viruses, spyware, crackers, adware and other Internet da It sports a plug-in architecture, making highly scalable.

digit 105



A journey away from boredom

hen your work starts creeping into dreams and weekends mean boring yourself with the TV, you need to take a break and hang loose. Studies show that our concentration levels on any task begins to dip after every 45 minutes. A short break can be fun in many ways and is definitely better than staring blankly at the monitor, forcing your mind to make sense of those crowded worksheets. You don't need to plan a holiday or even spend too much time on your break. Here's what I do for a bit of relaxation when the boss isn't looking.



Webcrosswords: Crosswords to relax your mind

Brainteasers

11.30 am and the brain
is already dead...
I can't find a better place to start

I can't find a better place to start my journey than www.bored.com. I put on the online radio from here and check out the list of new wacky sites they've dug up. Now I've got a roadmap for my little excursions from work.

First stop, a little intellectual stimulation with crosswords at www.webcrosswords.com. Most of the clues are about movies, so they should be easy to solve—I don't need to call out to my Thesaurusquoting colleague every 5 minutes.

I've finished one crossword and decide to give another go at that project proposal. But the words are still a jumble, so I want to look for something even more invigorating-maybe a little philosophy will wake me up. I set the co-ordinates of my astromobile to www.crazythoughts.com to look up some of life's unanswered questions. Now here's a thought-provoking one: If you stick stickers on non-stick pans, do they stick? I'm going to find the answer to this one the moment I reach home! There are more such brainteasers at www.straightdope.com. This one sounds funny: if all 1 billion Chinese jumped at once, would the earth be thrown out of its orbit? The answers are even funnier.

I suppose the grin on my face is a dead

give away that I'm goofing off. Well, time to get back to earning my bread and butter!

2.00 pm and that heavy lunch is making me drowsy...

I could revisit some of the sites I went to earlier, but last night's dream is still on my mind and I am curious about what it means. I dreamt I was alone in a forest. Heavy mist was swirling around me and I could hear some weird sounds. I think I even saw a ghost. I head to www.freaky-dreams.com I describe my dream and the site gives an interpretation based on a few keywords it finds in the text. It's not really worth hanging on to, but fun nonetheless.

Here's something you can slip in as an excuse for management training—at www.lemonadegame.com you manage a lemonade stand and depending on the weather conditions, decide the price of each cup of lemonade and how much



Emode: Know thyself

sugar, ice and lemons you would use per cup. I'm sure I can come up with a very profitable business model!

Enough of time pass. I should be doing something productive now. I have a meeting lined up, and I start gathering all the reports for it. But my secretary has just told me that there's a slight delaytoo short for me to start with work, so I log on to www.emode.com to find out a bit about myself. There is a huge collection of tests that can reveal a lot about my IQ (I think I'll skip those), my personality, lifestyle, the right career path, even my relationships! There's one that catches my eye-it's a test to find out which car matches my personality. The test scores show that I'm a practical person and the perfect car for me would be a Toyota, Honda or a Ford Escort. Now if only they would provide the required funds as well! I want to try out the other tests too, like the one which determines whether I'm in the right job and the matchmaker, but I'll hold them for later. PsychTests (www.psychtests.com) also has a truckload of personality tests.

4.30 pm. Whoa! That meeting looked like it would never end...

My head is spinning with all the ideas that were thrown up in the meeting and the things I need to do. At this moment I would give anything to be able to do something that doesn't require much thought!

Snap Bubbles (www.snapbubbles.com) seems like the perfect place to do practically nothing—all you do is keep snapping the bubbles on virtual bubble wraps! The Reflex Tester Game at www.reflexgame.comis quite addictive. The deal is that when I click Start, the background colour changes after some time and I have to click Stop the moment it does. I have at times spent close to half an hour just hitting Start and Stop. I blame the caustic remarks that follow for egging me on! If I take more than a second to respond, the damn thing asks me if I fell asleep, and even at 0.28 seconds, it asks me to get better!

I think I'll go play some more intelligent games at www.sandlotscience.com instead. The slider puzzles are very engrossing—one tile is missing from a square and you have to slide them around till they form the correct picture. Fortunately, the ones here are quite simple.

A little nagging voice in my head is telling me to get back to work. I must heed it. else I'll land in trouble!

7.00 pm. I am waiting for my colleague to finish work so we can go home together...

I need to kill some time while my friend wraps up work for the day. Maybe I should try my hand at building robots! Sodaconstructor (www.sodaplay.com) gives me a neat little lab where I can do just that. It's all pretty simple and I can spend hours watching my creations crawl and float around under different conditions of gravity, friction, etc.



Sodaconstructor: Lazy bum to Einstein in minutes

Quiet Reading

11.30 pm. I'm waiting for sleep to take over...

It's been a typical hectic day at work and there's nothing interesting on TV. I really do need something that will help me relax. I

think I'll just dig up some easy reading. OxymoronList.com (www.oxymoronlist.com) seems like a nice spot to visit. It claims to have the largest collection of oxymorons online. Ever thought of how someone can be 'awfully nice'? Or why they call it the 'Peace Force'? Maybe I can use a few for my next report. Here's another feel-good destination that never fails to cheer me up—www.goodquotes.com My favourite sections are Famous Last Words and Bumper Stickers. The Answering Machine messages are quite entertaining too, but the pickup lines are quite silly.

Bloopers have been my all-time favourite. Bloopers are mistakes that find their way to the public. Usually they get recorded in movies and TV shows, but can be found in print too. Slip Ups (www.slipups.com) has a huge collection of bloopers and www.eeggs.comhas a whole list of Easter eggs—amusing items hidden in software, movies, music, etc. There are thousands of them and they can be quite entertaining. I've seen ET several times, but I completely missed this blooper—the refrigerator in the film repeatedly changes colour! Nor did I notice that in Gone in Sixty Seconds, when Kip Rennes is in the

Signs You are Wasting Too Much Time

- What you read on the Net becomes the subject of most of your social conversations.
- You spend most of your free time building up strategies for solving games and puzzles.
- You get bored by what's supposed to kill boredom.
- The language from these Web sites finds its way into your monthly reports.
- Forum members and Webmasters become your heroes.
- You start ignoring nature's calls to get more time at these sites.
- ■You start looking forward to the daily joke more than the e-mail from your girl-friend/boyfriend.
- The number of jokes you receive by e-mail crosses the amount of spam you receive daily.
- You've already bookmarked most of the sites in this article.
- Your Favorites are neatly organised into Puzzles, Jokes, Quotes... and you have just one folder called Work.

car being crushed by Raymond Kalitrey, the back window of the car smashes. A little later, it smashes again!

While I am surfing for more entertaining reading, I stumble across News of the Weird (www.newsoftheweird.com). It has a collection of bizarre but true news items from the United States. Reading one news item a day from here will surely keep boredom away. I read one about a 34-year-old woman from Texas who was attacked by three lions in a pen at a game park in South Africa when she started petting one of them.

Confessions from people at www.daily-confession.com are more fun—these are personal accounts of people's doings. There's this confession from a person who loathes jaywalkers and has a deep-seated urge to hit them! There's another from a poor guy who hates wearing glasses in public because one of his ears is slightly higher than the other! Even funnier are other people's responses to these confessions.

My journey through cyberspace in the quest for the interesting and the puerile takes me to www.elibs.com. This site has a very interesting concept: I type a few words and it spins an amusing story using them. If you don't want to sit about typing words, you can just read some of the stories

digit 107

insight ■ netreturns



Daily Confession: Up to no good

created by others. The stories are quite amusing, but even more entertaining are the words that some people have entered!

Metaspy (www.metaspy.com), a similar site, lists out the words and phrases people search for at the MetaCrawler search engine. Who would have thought that people actually search for haircut styles, old truck guides and...fun Web sites!

The best stop so far has been at Useless Information (http://home.nycap.rr.com/useless/index.html)—stuff, as they put it, you

The Goofer's Guide to Looking

- Keep a Word document or Excel spreadsheet open. Switch to it using the quick [Alt] + [Tab] combination every time someone passes by and if possible, say something insightful.
- If you have to switch to the document, scroll down a few sheets or open another document in case the same person passes by.
- Use the [Win] + [D] combination liberally to minimises all windows and show the desktop.
- Mute the sound on your computer.
- Keep a straight face when reading jokes, look intensely into the screen and rub your chin every few minutes.
- Don't look frazzled while solving puzzles lest someone offers to help. If you need to ask others for clues, make it sound like you are talking about cricket or world politics.
- Keep a lot of important-looking paper strewn on your desk.
- Discuss work at lunch; it makes you look sincere.
- Keep a Tom Sawyer excuse ready. If someone does catch you loafing, explain the importance of taking a break and get them to do the same.
- If any of your bosses shares your copy of Digit, tear out these pages before passing it on.

never needed to know but your life would be incomplete without! Yes, my life really was incomplete till I found out that the island of Manhattan was sinking into the Hudson Bay due to the weight of its buildings! Oh, and I already knew this one: David Rice Atchison is the only man in history to have been President of the United States for just 24 hours. Here's another interesting tid bit: when Pearl Harbor was bombed, one ingenious scientist came up with the idea of getting a million bats, cooling them down to hibernation, attaching incendiary bombs to them and releasing them over Japan. The bats would reawaken and seek shelter in the dark nooks and crannies of homes and businesses and a few minutes later, the whole country would be ablaze.

Well, all this reading has done me good and I am ready for bed.

10.30 am, chilling at home...

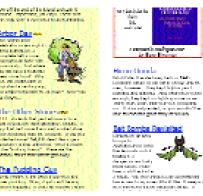
It's a Saturday and there's no work. Lets see if I can find more sites to cut the tedium of a long, dull day. But this time I'll try out sites that will give me some serious education—might as well make it productive time pass!

A site called SoYouWanna.com (www.soyouwanna.com) teaches you how to do all the things nobody taught you in school such as avoiding traffic police, how to talk with the dead and how to lose weight. Ah! Here's an interesting one: how to ask your boss for a raise. Hmmm... here are some handy tips, but they won't work if he finds me loafing around. I think I'll not spend so much time looking for breaks in office then!

Last Laughs
2.00 pm and looking for
more fun...

Enough of learning new tricks! It's the weekend after all! At home, relaxing with a chilled glass of orange squash is a good time to catch up on some jokes. And no better place to start than www.jokes.com. They have everything: blonde, lawyer, medical, office, bartender and yes, adult jokes, too. They've even got the classic "Horse walks into a bar and the bartender asks, 'Why the long face?'" joke.

From here, I navigate to www.funky-pages.com. I could use up my entire Internet account right here, just clicking all the links! The site has videos, optical illusions, games, card tricks, poems and of course,



Useless Information: Knowledge is power

jokes of all genres. A special tip: don't forget to visit the Microsoft jokes.

What can be more fun than watching others squirm! It's time to send out some of those practical jokes from www.strangereports.com. Wondering why they call themselves StrangeReports.com? That's because they can make up really funny news articles about people, which will have them begging for mercy while you laugh your head off. Try the one about the Man Caught Peeping In Toilet and see how many of your friends turn beetroot-red.

ForwardGarden (www.forwardgarden.com) claims to have the largest database of jokes, stories and opinions on the Internet. It's actually a collection of funny stories and



Jokes.com: Looking for some fun

chain mail that people have been sending each other. They even have SMS forwards. This is the site to turn to when you are in search of a quick laugh. I've been checking it out for a few months now, but still haven't been able to read through all the jokes. However, I prefer sending out jokes and funky animations from www.sending-fun.com since the items on ForwardGarden have probably been forwarded more times than you would care to count.

It's evening and much cooler now. Time to go out to town and have some real world fun with my friends. So this is where my journey ends...for now.

VEER KOTHARI



30 Minutes Expert

Driving your graphics card higher

In the quest for a better gaming experience, the route one often takes is that of buying a new feature-packed graphics card. But just upgrading your graphics card and monitor drivers can give you increased stability, more features and push those *Quake III* frame rates a couple of notches higher. And you don't have to spend anything to get these benefits through a driver update. However, if not approached in the right manner, this can make you susceptible to bottlenecks. Lets walk the route of upgrading and see how this can be done the right way!

As an example, we are using an nVidia Riva TNT2 graphics card on Windows 98 SE, but the steps are pretty much applicable to all cards and operating systems.

Revert to the standard driver First, you have to revert your graphics card to its original driver. Doing this provides the smoothest upgrade path and minimises the chances of any clash between



Select the Standard VGA graphics driver

the old and the new drivers. One driver that works with all types of graphics cards is the Standard VGA (SVGA) driver found in all versions of Windows.

To revert to the original driver, in *Control Panel > Device Manager*, access the Display Adapter and right-click on your graphics card listed there. Under *Properties > Driver*, select Update Driver. Select 'Display a list of drivers' and then select 'Show

all hardware'. At this point, the Hardware Wizard will scan your system. Scroll to the 'Standard display types' in the left pane and select 'Standard PCI Graphics Adapter (VGA)' from the right pane. Click Next and the driver will load.

After rebooting, you will notice that the system uses the SVGA driver, since you have only a 256-colour palette.

Run the setup file for your new drivers. During installation, if asked to overwrite any files, click Yes. When the installation is complete, it will prompt



Run the setup for your new graphics driver

you to reboot the system. After restarting, open *Control Panel > Desktop > Settings*. The new driver will be listed here and you can set a higher screen resolution and colour depth.

Loading the monitor driver

Unless you have the correct monitor drivers, you will not be able to run the monitor at an optimum refresh rate and resolution. To install the monitor drivers, go to *Control Panel > Desktop > Settings > Advanced* and click Monitor. If the monitor is listed as Default Monitor, you need to load the drivers for your monitor. Click Change and browse to the location of the driver—it will probably be on the floppy disk accompanying your monitor. If you

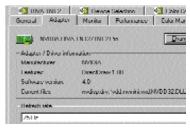


Choose the correct driver for your monta

do not have the disk, select an apparent monitor from the Standard m types (e.g. Super VGA 1024x768 at 7 This driver works with most monito will allow you to run your monito comfortable refresh rate and resolutions.)

Setting your resolution refresh rate

After loading the drivers, you need the refresh rate—go back to Display erties, click the Settings tab and so to 1024x768. Click Advanced and the Adapter tab. Here, set your refres to 75 Hz (or higher, if available) an



Set your refresh rate to at least 75 Hz

Apply. If your monitor does not this change (the screen goes blank), your resolution one notch and try When you find a setting that gives ble display, click OK.

Congratulations! You've successupgraded your display card's drive are all set to experience better fe and smoother graphics performance.

MARCO E

insight troubleshooting



Printing problems, tackling viruses, connecting PCs, a forgetful BIOS and much more—find your answers here

XP Startup disk

Q. I have installed Windows XP Professional on my PC and want to create a Startup Disk, but there is no option to create it. Please tell me how I can create a boot floppy.

Suman Saha

Via e-mail

A To create a boot floppy for Windows XP, format it first from Windows XP by typing format a: at the command prompt. Copy the Ntldr, Ntdetect.com and boot.ini files from the root of the boot drive. If you are using a SCSI hard disk, copy the driver for the SCSI controller to the floppy and rename it Ntbootdd.sys. You can now start your computer by booting from this floppy disk.

I'm DUN for

Q. When I connect to my ISP using a dialup connection, the username and password gets verified, but the 'Logging on to network' dialog box remains on the screen for over a minute. Can you help me out with this?

Buzz

Via e-mail

All you have to do is disable the 'Log on to Network' option in the dial-up connection's settings. To do this, open Start > Programs > Accessories > Communications > Dial-Up Networking, right-click the connection and click Properties. Under the Server Types tab, disable this option. Windows will no longer try to log on to the network and you will be



Browse the Internet without logging on to the network

able to use the Internet without any problems. Also note that if you leave this option enabled, you can start surfing as soon as the modem connects, without waiting for the 'Logging on to network' dialog box to disappear.

Stacked

Q. While working with Internet Explorer, I get the following error message quite frequently: 'Terminating thread due to stack overflow problem. A vxd consumed too much stack space. Increase setting of MinSPs in System.ini or remove recently installed vxds. There are currently 6 SPs allocated. Hit any key to proceed.' The computer seems to hang for a while and

then works properly. Please give m solution to this problem.

Navin Kumar

Via e-mail

A This happens when Windows en ters an internal overflow of stacks u 32-bit Windows-based drivers—u due to a fault in the driver itself. D are allocated 4 KB of memory to be as a stack and if it uses more than t stack overflow occurs. By default, dows sets aside two spare stacks to be temporarily so that the computer not hang. If Windows detects that run out of spare stack pages, you r the aforementioned error message.

To solve the problem, add Mile to the [386Enh] section of C:\Windows\System.ini file. You continue increasing the spare stack from here by increasing the number will have to restart the computer editing the file for the changes to effect. However, you should get up drivers for all your hardware to make that you are not using buggy so that could be harmful in the long in

Corrupted e-mail

Q. I have been using Outlook Expres the last two years. I had around 6,000 sages in my inbox, but due to power it got corrupted. It is now showing on messages. The size of the file (inbox.r 150 MB. Can my messages be recove

Yash Garg

Via e-mail

digit 110

NOVEMBE

A Your mailbox file seems to have been corrupted, but the file that you checked does not seem to be the right one. Microsoft gave up the MBX file format after Outlook Express 4. However, if this is really the file, you are in luck—you can retrieve at least the text part of all your e-mail by opening the file in a text editor. Notepad will not open such a large file, so use a better software such as NoteTab Light (www.notetab.com) or EditPlus (www.editplus.com). Note that while opening such a large file, the system may seem to hang, but let it open the file nevertheless.

In Outlook Express, open Tools > Options > Maintenance > Store Folder to determine where the mailbox files are stored. Outlook Express 5 stores e-mail in the DBX format. If this is also such a large file, try importing it to another identity or in another program such as Outlook. However, since you have already opened and closed Outlook Express several times, it may be impossible to retrieve the data and the file size may be just wasted space, which will reduce when you compact the folder (File > Folder > Compact).

Landscape printing

Q. I have a Pentium III with 256 MB RAM and a 40 GB hard drive with Windows 2000 Professional, Service Pack 2. I have an HP Deskjet 670C printer installed. While printing any document in landscape orientation and draft mode, the printer prints from the right edge of the paper, irrespective of the right margin set. However, this does not happen with portrait orientation, or with normal and best modes.

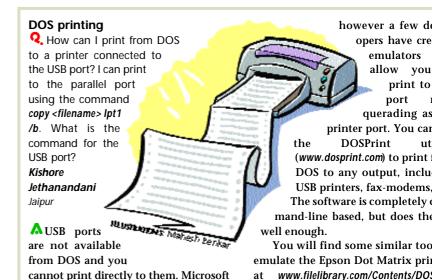
Koyande

Via e-mail

A This seems to be a problem with the printer's drivers. You can find the relevant drivers at http://welcome.hp.com/country/us/ eng/software_drivers.htmlf. If this does not solve the problem, download the drivers for a printer from the same family (e.g., 660C or 690C) and try those instead. Also, when printing in landscape orientation, try using the Landscape (Rotated) option.

Modem network

• After reading your article on connecting two PCs using modems, I tried it out with my friend. Both of us have Motorola SM56 PCI Internal Modems. The PCs connect successfully, but we cannot see our



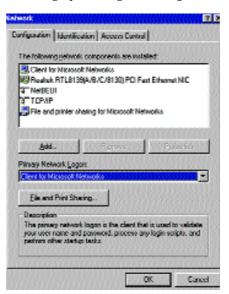
shared folders after typing \\ipaddress\sharename. When I open Network Neighbourhood and click Entire Network, it shows a message that says 'Unable to Browse Network'. Ping receives a successful reply.

claims that there is no solution for this,

Kuldip Modi

Via e-mail

A Both, you and your friend may need to be logged on to the network to be able to browse the shared resources. There are two ways to do this. Open Control Panel > Network. Set Client for Microsoft Networks as the 'Primary Network Logon'. The next time you start Windows, it will bring up a dialog box to log on to



You need to be logged on to browse shared resources

Windows. Enter a name and [Enter]. Now, when you connect should be able to browse each o shared resources. The other wa achieve the same is by enabling the on to Network' option in the D Connection's properties, as desc under 'I'm DUN for' (page 110).

Capturing movies

/5.html.

Q I have a Pentium 4 1.5 GHz ma with a 20 GB hard disk, 256 MB RE 32 MB video card, a TV tuner card 12x CD-Writer. I captured a movie the TV tuner card and the size of t was 30 MB for a 10-second clip! If I to capture a two-hour movie, it occupy around 20 GB of space. W extra hardware, can I convert the r directly to an encoded format?

T. Gopal

Madurai

Raw movie files are indeed very hungry, and unless you compress while capturing, you can rarely ho record more than a few minutes' of video. If the software bundled wi capture card does not allow you to compression codec while capturing can use other software such as Virtu (www.virtualdub.org) to do so. When turing with VirtualDub, click File > C AVI to switch to capture mode. Click Set capture file to specify where th should be saved. Click Video > For set the frame size and format. Oper > Compression and select a codec for captured video.



insight troubleshooting

Networking two PCs

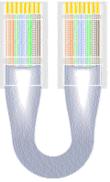
Q. I have two computers and two network cards. Is it possible to connect them without modems or hubs?

Sawma Lunglei

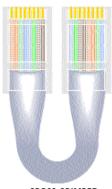
Via e-mail

A To be able to connect two PCs directly using LAN cards, you will have to use a cross-crimped network cable—it's not as complicated as it sounds. All network cables are

made of four pairs of wires, connected to RJ45 connectors. For a standard network, you would ensure that the colours of the wires at both ends are in the exact same sequence. For a direct PC-to-PC network, one pair of wires on







CROSS-CRIMPED

one connector would be in the opposite direction to the wires at the other end. You can have such a cable made by any hardware engineer. Just plug this into the network cards and your network will be up.

Choose the codec for the captured video

Outlook password

Q. Whenever I start Outlook, it opens my account by default. How can I protect Outlook with a password so that every time it is launched, it asks for authentication?

Gaurav

Via e-mail

▲ In Outlook, you can protect the data file with a password. To set the password, click File > Data File Management > Settings > Change Password. Enter the password and disable 'Save this password in your password list'. Now every time you open Outlook, you will be asked for this password, without which Outlook will not load the message store.

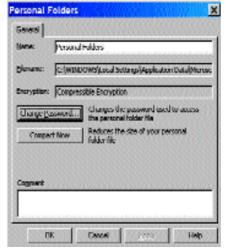
Virulent PC

Q. I have a Celeron-based computer with Windows 98 SE. My computer is infected with the VBS/Redlof virus. I use AVG anti-virus with the latest updates, but it cannot remove the virus. Please provide a remedy for this.

Dinesh

Via e-mail

AVBS/Redlof is a VBScript virus that infects HTM, HTML, ASP, PHP, JSP, HTT and VBS files by appending a script that contains an encrypted copy of the virus



Protect your e-mail in Outlook

code. Viewing an infected HTML document activates the virus. It usually targets the file folder.htt (used as a template for viewing folders as Web pages) stored as a hidden file in the Web folder under Windows. It will also be copied to kjwall.gif in the same directory. Like many of the worms found today, it propagates via e-mail by infecting blank.htm, the default stationery file for Microsoft Outlook or Outlook Express. The registry is edited to ensure that the infected user includes this default stationery file when composing e-mail. An infected VBScript

is copied to the System folder a nel.dll or kernel32.dll. Microsof issued a security patch, which se against such vulnerability http://www.microsoft.com/technet/securiletin/MS00-075.asp.

To remove the virus, first del Temporary Internet Files *Control F Internet Options* and click Delete Next, delete the following registry for each user who ran the virus:

HKEY_CURRENT_USER\Identit d>\Software\Microsoft\Out Express\<Version>\Mail\Compos Stationery

HKEY_CURRENT_USER\Ident <Id>\Software\Microsoft\Ou Express\<Version>\Mail\Static Name

HKEY_CURRENT_USER\Ident <Id>\Software\Microsoft\Ou Express\<Version>\Mail\Wide Stati Name

You should check all the ider present and all versions of Outloo each user, a registry key HKEY_USERS stores their personal mation. For each user, locate the fo ing keys and delete them:

HKEY_USERS\<id>\Software\Mic \Windows Messaging Subsysten files\Microsoft Outlook Internet tings\0a0d020000000000c000000 0046\001e0360

HKEY_USERS\<id>\Software\Mic



Prevent infected stationery from being u e-mail

FAQs

60 going on 200

I have a GeForce4 Ti 4400 Deluxe 128 MB graphics card on an Athlon XP 1700+ system with 256 MB DDR RAM and 40 GB hard disk on an ASUS A7V 266-EX motherboard. I have the latest nVidia and VIA 4 drivers installed. I have run many games such as Quake III Arena and Return to Castle Wolfenstein-in all of them, the frame rate is stuck at 60 fps at 1024x768 resolution. Even at lower resolutions, it hardly gets to 100 fps. The 32 MB GeForce2 MX card I had earlier was better. I have seen many of your tests where the fps is more than 200. Please tell me how to get that.

Shikhar

Via e-mail



Turn off Vertical sync for higher frame rates

A The problem is that the card's driver is limiting the number of frames per second, based on the monitor's refresh rate. You can turn this off by opening Control Panel > Display > Settings > Advanced > GeForce4 Ti 4400 > OpenGL Settings. Here, look for 'Vertical sync' and change its value to 'Always off'. If this does not help, download a utility called NV Refresh Tool 2.0 (www.nvmax.com) and use it to set all refresh rates to the maximum supported.

Slow hard disk

Q. I have a Pentium 4 1.6 GHz system with 128 MB RDRAM. I have dual-booting operating systems, Windows 98 SE and Windows XP. When I copy data from

one drive to another while in Windows 98, it takes a lot of time as compared to the same copy operation while in XP. For example, if I copy a movie of size 1.5 GB, it takes 25 minutes in 98 and 4-5 minutes in XP. The second problem is that when I play games in 98 SE, the images jerk and sometimes the system hangs, but while in XP they work properly. Please suggest a solution.

Nitin Mishrauliya

Jodhpur

A The hard disks could be working in PIO mode while in Windows 98. DMA mode for storage drives is enabled by default in Windows XP, but not in Windows 98. To enable DMA for your hard disk, open Control Panel > System > Device Manager. Double-click the hard disk under the Disk Drives branch to bring up its properties. Under the Settings tab, check the box next to DMA. On rebooting to Windows 98, you should be able to notice the difference in performance. For the same reason, games also do not respond well in Windows 98.

Bad timing

Q. I have Windows Me and Windows XP installed on different partitions. When I start the computer, its clock shows the wrong time every day. It shows 1/1/1999 and displays a message, 'CMOS checksum error'. Please tell me the cause of this error and the solution.

Vishal

Via e-mail

The CMOS battery seems to have died. This little battery, about the size of a 50 paise coin, is located on the motherboard itself and powers the CMOS while the mains are off. If this battery is dead, the CMOS will no longer get power and will lose all information in its memory every time the power is switched off. When this happens, the CMOS loads the default configuration from the ROM, which would have only a particular date set. All you need to do is change the battery to solve the problem. The battery (CR2032) is readily available in the market.

 $\label{local-common-Maitings-NewStationery} $$ \operatorname{NewStationery} $$$

HKEY_USERS\<id>\Software\Mic
\Windows\CurrentVersion\Run\.c
HKEY_USERS\<id>\Software\Mic
\Windows\CurrentVersion\Run\d
Also delete HKEY_LOCAL_MACl
Software\Microsoft\Windows
rentVersion\Run\Kernel32 if it exi

Restart the computer and dek HTT files and Kjwall.gif from C:\ dows\Web. Start Outlook Expres open Tools > Options > Compose. In the tionery section, uncheck Mail or your own stationery

Setup problem

l had created an Address Book cation in Visual Basic and using the age and Deployment Wizard, I crea setup files. I tried installing the appli on my office PC. It went fine till the lowing message appeared: 'C: dows\System\ MSVCRT.dll. An violation occurred while copying th It gave three options, viz., Abort, and Ignore. Retry didn't work, so Ignore. It then gave another messac ing, 'If you ignore a copy error, the f not be copied. The application ma function properly as a result. Do you to ignore the error?' On clicking Ye rest of the application installed smc It also runs correctly. Can you tell me the above error means and how I ca rid of it?

Prashant Patel

Via e-mail

A The error message is being displecause the file is currently in use. dows programs use shared librari common functions, thus reducir number of files for each application also allowing developers to reuse tions and APIs. This is why you salways close all open programs linstalling any software. Your soft tried to overwrite a file while it was used by some other application, caused the error and your softworked perfectly because the fil already there.



D-222/2, Om Sagar, MIDC, Nerul 706, and we may answer it here!

8

tips Ctricks

Foul Play

Written in invisible ink on page 456 of Sung Zu's *The Zen of Gaming* is the golden rule that has rescued many a gamer from the throes of insanity:

If at first you don't succeed, cheat!

need land you have a second and you have a s

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IMAGING: Ashwin Boricha



The bosses are a piece of cake when you are the Barbarian. Just keep your quickslots filled with health potions—hack, gulp and repeat

The Barbarian

The Barbarian is the best melee fighter. His brutish strength allows him to hack through hordes of enemies much like a hot knife glides through butter.



While playing as a Barbarian, some good skills to invest your points in are Bash, Double Swing, Leap Attack, Concentrate, and Whirlwind. Look out for the Face while playing as this character.

The Amazon

The Amazon lets her bow and arrow do the talking; and she isn't half bad with the spear either! Her excellent dexterity gives her high Attack and Defense ratings, which when combined



with the skills that she can unlock at higher levels, makes her one mean killing machine. Temper her character with these skills: Cold Arrow, Multiple Shot, Immolation Arrow, Freezing Arrow, Critical Strike, Penetrate, Decoy and Evade. Titan's Revenge, Lycander's Aim and Lycander's Flank are the unique weapons that you should keep an eye out for while playing as an Amazon.

The Necromancer

The Necromancer is the summoner of all things

mean and undead and should be looked upon as an army general who lets others do all the dirty work while he meanders in the background casting spells and cursing away. Amplify Damage, Confuse and Attract (especially when used in conjunction with Confuse) are some of the curses that along with spells and skills like Bone Armor, Corpse Explosion, Bone Spear, Bone Spirit, Golem Mastery, Clay Golem, Iron Golem and Revive, should be part of your Necromancer's repertoire. The Homunculus is by far the best shield any Necromancer could hope to find.

The Paladin

The Paladin is an aura dude. While hacking your way through the single player mode, Offensive Auras are a must (Concentration and Holy Freeze, for example). Multiplayer romps demand investment in Defensive Auras like Defiance, Meditation, Redemption and



Salvation. To further augment his defence, a Paladin should not miss the Herald of Zakarum, the best shield that this holy avenger can hold.

The Sorceress

The Sorceress can be quite a challenge to play with-she should avoid direct contact with enemies and hone her skills in specialised magic. Glacial Spike, Blizzard. Frozen Orb. Fire Ball. Blaze. Static Field, Nova and Chain Lightning are some of the spells that will go a long way in improving your chances of survival as a Sorceress. No monster-hating caree woman should be caught without the Oculus, which in conjunction with a good shield, will see you through most bad days.

Getting There

The Secret Cow Level
You can moo your way to a
Secret Cow Level after finishing the game. Get back to
the Rogue Encampment, put
Wirt's Leg and a Tome of
Town Portal into the Horadric
Cube, transmute it and a portal leading to the bovines will
appear. Once you kill the
Cow King, you cannot return
to these green pastures. Keep
him alive and milk the place
for items and gold.

To Kill a Beast
Fire resistance is highly
essential in the final showdown with the menacing
Diablo. You can use the
Horadric Cube to transmute
a ring of fire resistance. To
do this, you will need one
ring, one ruby and four vials
of Exploding Potion. This
will give you the Garnet
Ring that offers a boost
of +21-30 to your fire
resistance statistic.

Need for Speed: Porsche Unleashed



Stick to the bumper view. It offers the best frame rates and angle for handling corners and the speed feedback is unbeatable

Brake it down

Never brake in the middle of a turn, especially when driving older Porsches—they have a tendency to roll over. Instead, brake early, turn smoothly and accelerate on the exit.

Touch and go

Rid yourself of those meddling cops by nudging them ever so lightly into oncoming traffic or the roadside obstacles.

A different route

When befuddled by a track or

mission, follow the AI controlled cars to get an indication of the best route to take—sometimes an alternative way will cut your time almost in half; you might also discover that what you thought of as a shortcut, is in fact the tortuous way to the finish line.

Torque it up

If you find yourself on a track where you can use a higher gear ratio with a lower RPM or a lower gear ratio with high revs, go with the latter every time.

Need for Speed: High Stakes

Accessing the mini game Select the 'Credits' icon after the game loads and change the display from text to photographs. Repeatedly click on the pictures that appear until a 'Click The Photo' mini game begins. The game keeps high score, so you can always come back to it.

Fireworks

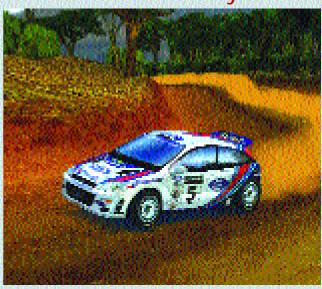
Set the system date to July 4 and sit back to enjoy the colourful fireworks during the game.

NFS: Porsche Unleashed Cheats

Go to the main menu and click 'Create Player'. To enable a cheat, type in the appropriate code for the player name. Click 'Done' to hear a confirmation sound. You can then choose your regular profile to play the game with the enabled cheat.

freewill	Drive twice as fast in the single player mode
Gulliver	Burn the tracks racing in radio controlled
	Porsches
Smash Up	Destruction Derby fun, thanks to the skidpad
Dakar	Changes car physics and tracks to a style more
	akin to Rally racing
Fuzzyfuz	Cops will now bug you in the Quick Race mode
yraGyraG	All cars will handle like the Porsche 993
fetherw8	Changes the car's physics by making them heavier

Colin McRae Rally 2.0



Use the handbrake to slide into corners and as far as possible slow down before tackling a sharp turn

Feeling cornered

Rally cars tend to slide around corners. To avoid this, always speed coming out of a corner rather than while going into one. Brake to slow down before turning around a corner and use the throttle to control your slide and gain grip. You can use the handbrake to slide into a sharp turn. When you skid, turn into the direction of the skid to correct it; once your car is pointing in the right direction, hit the gas pedal.

insight ■ tips and tricks

Gearboxes, the weather and everything in between

Once you feel comfortable with your car, switch to a manual gearbox that will give you greater control over your vehicle. Pay close attention to the directions that your co-driver deals out but do not be afraid to improvise. Understand the

differences in the surface of the tracks—a tarmac stretch will require drastically different techniques and wheels than driving on a mud track. The weather can dramatically alter both the handling conditions and visibility. Check the weather forecasts on the stage information page and adjust your tires.

Colin McRae Rally 2.0 Cheats

Enter the following codes at the 'Create New Driver Profile' screen to activate the corresponding cheat:

ALLTHEBUTTONS	Unlocks all cars
GREATNEWS	Unlocks all tracks
MINIME	Unlocks the Mini Cooper S
TURNONTHEICE	Lets you play the car stereo
MORRISMODE	Unlocks the Escort mk1
SHINYBUTTONS	All cars become new and shiny
GOFASTERSTRIPES	Makes the cars go faster
CURRYFORME	Gives you turbo boost
NUTTYNETS	Makes the opposition aggressive
BOUNCYBOUNCY	Makes the collisions bouncy
WHEELYBIG	Gives you monster truck wheels
BOINGBOINGBOING	Bouncer mode
WAWEYOURLEFTS	Mirrors the tracks
EATTHIS	Press the handbrake to shoot fireballs
	in arcade mode
GARYWILDASS	Unlocks the Ford Puma
EVILEVO	Unlocks the Lancer Road
LETMEWIN	Opens all game options

Aliens vs Predator 2

While in game, press [Enter] and type <cheat> x (note that there is a space after <cheat>). The x should be replaced with one of the codes below. The press [Enter] to enable the code.

mpcanthurtme Turns God mode on/off

mpschuckit Adds weapons and ammunition

mpsmithy Gives you full armour

mpkohler Gives you full ammunition

mpbeamme Beams player to level start with initial conditions

mpsixthsense Walk through walls (on/off)

mpicu Third person view (on/off)

FIFA 2000



Jumping up and down and acting like a monkey is just one of the essentials to a healthy lifestyle

Black and white scheme

Select two classic teams and start a match for a black and white colour scheme.

The colour orange

For a change of hues, select a classic and standard team and start a match for an orange colour scheme.

Finding Ronaldo

Ronaldo can be found in the game playing as jersey no 9 and plays for the Italian side, Inter Milan and the Brazilian national team.

Finding Pele

Pele is jersey no 10 and plays for the Classic Brazilian team, Santos '62-'63, and the Classic Brazilian national team (Brazil '58 and Brazil '70).

Finding Romario

Romario wears jersey no 11 and plays for the Brazilian team side, Flamengo.

Finding Youri Djorkaeff

Youri Djorkaeff may be found in the game as jersey no 14 and plays for the German side, Kaiserslautern.

FIFA 2000 Cheats

Enter the following at the Cheats menu:		
MOMONEY	Gives you unlimited funds	
SIZZLE	Lightning mode	
DIZZY	Alien mode	
HOOLIGAN	Unlocks Bonus teams	
BURNABY	Unlocks the EAC pitch	
LIGHTSOUT	Glow mode	

The Sims



You need to keep yourself abreast of your Sims' wants and needs. Seemingly mundane tasks like socialising and picking the kids from school have to be dutifully performed

I wanna rock DJ

If you want new music for your radio, why not play your own MP3 songs? Find the directories titled latin, rock, country and classical in your Sims game folder. Copy your favourite MP3s and put them here.

Bills begone

Keep an unpaid bill until the mailman delivers a new set of

bills. Then pay the original unpaid one. This will cause the new bills inside the mailbox to disappear.

Personality test

When you create a Sim, do not give it a personality. Proceed to buy a chemistry lab and create a yellow potion for your Sim to drink. This will reverse its personality and give it points on everything!

The Sims Cheats

While playing, press [Ctrl] + [Shift] + [C] to bring up the cheat window. Now type in one of the following:

Rosebud/klapaucius	Gives you 1,000 simoleons (for
	patched version)
WATER_TOOL	Puts water around your home
SET_HOUR (1 to 24)	Sets time of day
SET_SPEED (-1000 to 1000)	Sets game speed
AUTONOMY (1 to 100)	Changes how much the Sims
	think on their own
INTERESTS	Changes interests and personality
SIM_SPEED (-1000-1000)	Sets Sim's speed
SIM_LOG BEGIN/END	Creates a log of your Sim's history

Starcraft

Press [Enter] during the gameplay, type one of the following codes and press [Enter] again to activate the corresponding cheat function. The message 'Cheat Enabled' will confirm that the code is activated. To disable the cheat, repeat the process with the same code:

operation cwal	Faster building and instant
	upgrades
the gathering	Unlimited psionic ability
power overwhelming	Indestructible buildings and ships
war aint what it used to be	Remove fog of war
show me the money	Minerals and gas increased by
	10,000
whats mine is mine	Minerals increased by 500
breathe deep	Vespene gas increased by 500
something for nothing	Everything upgraded
food for thought	Ignore supply limit when
	building units
black sheep wall	Full map
noglues	Opponent has no psionics
modify the phase variance	Build anything
medieval man	Free upgrades to units
staying alive	Continue after mission completed
man over game	Win game
game over man	Lose game
special warriors for nothing	Free Special Hero

SimCity 3000

119 NOVEMBER 2002

Age of Empires II: Age of Kings



Building your structures close to the coastline is asking for trouble. Avoid falling into this trap

Age of Empires II Cheats

Press [Enter] to bring up chat box, then type:

ROCK ON	1,000 stone
LUMBERJACK	1,000 wood
ROBIN HOOD	1,000 gold
CHEESE STEAK JIMMY'S	1,000 food
MARCO	Reveals the entire map
POLO	Removes fog of war
AEGIS	Fast build
NATURAL WONDERS	Control Nature
RESIGN	Makes you lose
WIMPYWIMPY	Destroy yourself
I LOVE THE MONKEY HEAD	Gives you a naked villager
	who makes an excellent scout
HOW DO YOU TURN THIS ON	Gives you a Cobra car
TO SMITHEREENS	Gives you a Saboteur
BLACK DEATH	Destroys all enemies
I R WINNER	Lets you win

Shortcut keys for unit commands:

[T]	Attack Ground
[C]	Convert
[Delete]	Delete Unit
[B]	Economic Buildings
[B] [V]	Military Buildings
[G] [E]	Garrison
[E]	Heal
[P]	Pack

[R]	Repair
[1]	Set Gather Point
[S]	Stop
[L]	Unload
[U]	Unpack

Shortcut keys for military units:

[A]	Aggressive
[D]	Defensive
[F]	Flank
[C]	Follow
[X]	Guard
[W]	Box
[Q]	Line
[E]	Staggered
[Z]	Patrol
[N]	Stand Ground
[0]	No Attack

Max Payne

Bonus Level

Beat the game on the Dead on Arrival mode to play at the bonus level. You will be put in a room with weapons and two doors. Pick any door. After you kill all the enemies who come towards you, go to the end of the room to find a passage that leads to a room filled with pictures of the game developers.



War of the Rats

In Part I: Chapter 2, you can cause the rats to war amongst themselves. In the subway level, when you first get to the old closed down station, you will find a hole in the wall. Throw a bunch of grenades and molotov cocktails into this hole. This will cause the mission objectives to change to 'I had declared war against the rats'. As you progress through this level, you will come across two factions of rats with Desert Eagles. If your group of rats wins, they will join forces and follow you through the rest of the level. If the other rats win, they'll turn their remaining forces against you.

Soldier of Fortune

After you confront Vinni Gognitto, he flees to the rooftops and leads you to a place with pipes that take you across the rooftop to a room with a window and a TV. Follow the side of the building you just came out of and look for a narrow, black window at the end. Take out your bat and break the window to reveal the Soldier of Fortune II room, packed with shotguns and one painkiller.

Half-Life

For these cheats to work, start Half-Life using the command hl.exe -console or hl.exe -dev -console. You can now access the console using the [~] key. To enable cheats, enter Sv_cheats 1 in the console. Type the following to enable the corresponding cheats:

/god	God mode on/off
/notarget	Your enemies will ignore you
/impulse 101	All weapons and ammunition
/impulse 102	Spawns giblets and blood
/impulse 103	Shows monster statistics when looking at a
	monster
/impulse 203	monster Delete monster or NPC from the world
/impulse 203 /thirdperson	
	Delete monster or NPC from the world
/thirdperson	Delete monster or NPC from the world Third person view

Jedi Knight II: Jedi Outcast

To enable the cheats, bring down the console by pressing [Shift] + [~] and type 'devmapall'. You can then enter any of the following codes into the console:

god	God mode
noclip	No clipping mode
notarget	Your enemies will ignore you
kill	Kill yourself
give all	Maximum weapons, health and armour
give health	100 per cent health
give armor	100 per cent armour
give ammo	100 per cent ammunition

Unreal Tournament

Press [~] to bring up the console. Type 'iamtheone' and press [Enter] to enable cheat mode. Now type in the following codes and hit [Enter] to activate them. Note that these cheats work only in single player.

god	God mode
loaded	All weapons
fly	Flying mode
ghost	No clipping
walk	Deactivate no clip and flight
addbots	Add indicated number of bots
allammo	Full ammunition
killpawns	Kill all opponents
behindview1	Third person view
behindview0	First person view
playersonly	Stop time

Quake III Arena



In open maps (like The Longest Yard) use the Quad Damage powerup in conjunction with the machine gun, for best results

Movie time

To unlock all cinematics, access the command prompt, go to your Quake directory and type: quake3.exe +seta g_spVideos "\tier1\1\tier2\2\tier3\3\tier4\4\tier5\5\tier6\6\tier7\7\tier8\8"

Colour me silly

If you want to be an elite Quaker, complete with a multi-coloured name tag, use these mystical mantras:

- ^1=Red
- ^2=Green
- ^3=Yellow
- ^4=Blue
- ^5=Cyan
- ^6=Purple
 ^7=White

So if my name was, say ennui_13, I would enter, ^1e^2n^3n^4u^5i^7_^61^73 into the console for a multicoloured rendition or just ^6ennui_13 for a single colour.

A fix for dial-up blues

If you are stuck with a dialup connection and lag is your permanent unwanted guest, you can simulate a laggy-single-player-experience™ to get better at fragging your opponents online. To do this, access the console and type cl_timenudge xxx, where 'xxx' is the ping time in milliseconds. Thus, if you generally experience pings of 200 ms while multiplaying, offline practice cl_timenudge 200.

Eye candy vs speed

■ The tweaks mentioned in the box, 'Command and Conquer' can be applied to your q3config.cfg but the best route would be to create a custom file for the game. To do this, create a new document, enter the requisite settings from the table and save the file as autoexec.cfg (or give it

- another name, say, custom.cfg). Make sure that you save the .cfg file in the baseq3 folder.
- To load your custom settings (in case you did not name the file autoexec.cfg) bring down the

Commands

cg_drawGun

cg_draw3dlcons

cg_gibs

r_picmip

r nocurves

r_subdivisions

- console and type /exec custom.cfg and hit [Enter].
- If you insist on appending these settings to the q3config.cfg file, remember that these need to be preceded by a seta tag followed by a space.

(use these values)

I want to Quake pretty I want to Quake fast

0

0

0

3

0

1

999

r_colorbits 1250 cg_brassTime 0 r_vertexLight O 1 r_primitives 0 r_fastsky O 1 r_dynamicLight 0

The Fast and the Furious

(use these values)

0

32

n

0-100

Quake III Arena Cheats

In order to use the following cheats in multiplayer mode, the server must have cheats enabled. To enable cheats, pull down the console window by pressing [~] and enter /spdevmap (map name). The name of a map could be q3dm1, q3dm17, or q3tourney2, and so on. During play, press [~] to bring down the console and enter the following:

/iamacheater	Unlocks all levels at Skill 1
/iamamonkey	Unlocks all levels at Skill 100
/model sarge/krusade	Hidden Sarge Skin
/god	God mode
/give all	Unlocks all weapons

If you prefer to change your Railgun to be more Quake IIlike, type the following into the console, or add them to the config file.

r_railwidth 25 r railcorewidth 2 r railseamentlenath 20 cg_railtrailtime 2000

Half-Life: Counter-Strike



While guarding potential targets, make sure that your team is covering all points of possible attack

Pack behaviour

Always attack in groups—the greater amount of firepower that this method deals out is sure to overwhelm your foes. Some weapons in Counter-Strike are more effective if used within a group-for instance, an M249 Para wielder that supports a group of SMG users or an assaulter with an M3 that is backed with support fire from the M4A1.

Breathing space

Although moving attacking in packs is a commendable tactic, make sure that your teammates do not crowd each other. Leave ample amounts of space between teamsters: this will prevent snipers from getting multiple-kill shots and will also give each team member enough room to manoeuver.

Of sneak attacks and safe rears

Try to attack your foe from behind. This invariably presents you with a large target area. The fact that the opponent will lose precious seconds turning to retaliate, will more often than not ensure a kill. To prevent getting nailed by this tactic, always attack with a buddy-an extra pair of eyes to spot interlopers and an additional gun to cover your back.

Attack as the best defence

If you doubt your enemy's position and status, or if you are well and truly cornered with nowhere to run but forward; grit your teeth, knuckle down with an assault gun and charge! That'll give you something to tell your grandkids about.

arcade ■ games

teet unde

We dig up a few games that died even before they were released and conduct an autopsy to discover why some developers bury their beloved creations alive

Vhen it's

rus:

n the fictitious Chicken Soup for the Game Developer's Soul, just before the philosophical discourse on the Done' policy, lies the 'Hype Manifesto'. It reads t your creation to the sky. Glorify each diminu tive aspect of your game. Let your Web site be an endless source of screenshots and preproduction artwork—learn from the success of Diablo II.'

In all seriousness though, within the game development business, ensuring visibility for your creation is an absolute must. Publicity and hype are the evils that every development studio with the intent of making a profit, must attend to. As much as we hate the hype machine that is put into overdrive before the release of a game, what reduces us to a frenzied mass of nerves is the termination of the project that was moments ago touted as the next best thing to sliced bread! The surest way that a development studio can rub off a fan the wrong way is simple: generate enough hype to reduce a gamer to a mindless zombie, wherein the said soul praises your game morning, noon and night-across message boards and pubs alike-then just as the doomed one's eyes start glazing over with that crazed, worshipping look, terminate the game! Much pain and anguish will follow. Why would a gaming company do this to their fans?

There are a number of reasons why a game is terminated-unrealistic cost calculations, shifting market trends, prolonged development processes and technical woes. A game might even be shelved simply because it didn't match up to the developer's expectations. Let us take a look at the reasons involved, in the hope of gaining a new perspective into the game development process.

It's the money, honey

Most of the problems in life can be traced to the absence of little green pieces of paper. Like everything else, creating a game requires a healthy dosage of this green energy, that is, lots of money. Bills have to be paid, Web sites need to be maintained, co ers need to be bought and upgraded with painful regularit iere is that little detail of sending out the salary sli

> finds its way into, haunt game deve both big and small. The source of this gy is usually the publisher, who becomes a demigod of sorts—se that dictate the course of a gar routinely delivered from boardr the brains behind the game while, have little choice but ten and to obey. Even if you independent game deve (a rare breed), you need a good bank account,

this and a billion other places that r

generous spouse. It should thus come surprise when a game p is cancelled because of l funds. Take the case of V Interactive, a German development house tha licensed the Unreal Engi create, what they hoped, be a good blend of action ar playing elements— The Y The company found itself in bled financial waters and des very positive feedback on games from the international a sustainable source of funding not be ensured. With no other left, Westka filed for insolvency than 44 employees were laid o the company had to eventually its business operations on Octo 2002. Although not officially de dead, The Y Project now shows zero of life.

Glance through a veteran gamer's favourites and chances are that you v upon a little gem titled X-Com: UFO D The game has an army of dedicated f ers. Even venerable game developers sw the title. It was thus surprising to lear Mythos Games had to abandon work sequel, Dreamland Chronicles: Freedom Rid ing monetary reasons. "It is with great that I have to announce that Dreamland ha cancelled. We have been looking for an

IMAGING: Solomon Lewis

digit 128

NOVEMBER

publisher for a while now, but no agreement has been reached and we have run out of cash. This means that there will be no further development on the game," thus wrote Julian Gollop, a Mythos programmer. This time however, the ending need not be a bitter one. For the allure of the X-Com license soon saw the project change developer hands and a Czech gaming house, Altar Interactive, took over the task, changing its

name to UFO: Aftermath. The game shows a healthy pulse and will hopefully soon see the light of day.

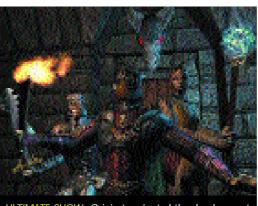
Another high-profile project that found itself on a sinking ship was the sequel to the highly acclaimed action/ adventure game, Outcast. Fans and critics alike were distressed to learn that Outcast 2 was in development limbo as its creator, Appeal, was forced to file for bankruptcy. Speculation that the game was dead, forced the company to issue an apolo-

getic statement, "Sometimes these kind of things happen. Unfortunately, we cannot disclose much about the situation, but please keep in mind that Outcast 2 is not cancelled—it has been suspended for an undefined period of time." One hopes that the 'undefined period of time' does not stretch for long, since games have a very short shelf life-what was a fresh concept not too

long ago can be as stale as yesterday's news in the blink of an eye.

Of moving platforms and maths

Another malady that forces a game to go off the radars of hopeful fans and critics has been duly studied, recorded and labelled as 'The Strange Case of Jumping Platforms'. Platforms, refer to consoles such as the Sony PlayStation, Microsoft's Xbox, the personal computer even. It so happens that when a game is being planned, certain features become difficult to implement, thanks largely to inherent limitations of the destined platform. If these features form the essence of the game, the developers find it more apt to introduce their game to a more suitable hardware. Case in point, Silicon Knights' Eternal Darkness. Originally slated for Nintendo's N64, the developers found that the console was not powerful enough to handle the game



ULTIMATE SHOW: Origin terminated the development of Ultima Online 2 as they thought that the sequel would dilute the market of their primary cash-cow-Ultima Online



HALO GROUND: Widely hailed as the game to c PC gaming forever, Halo jumped ships, got cosy the Xbox and is not expected to revolutionise con games for some time to come

I don't look upon it as failure but as a ver long learning experience. It's a failure if you just keep doing the same thing over and over again. But it was an expensive lesson to some extent Bill Roper, Producer, Warcraft Adventures,

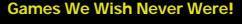
Blizzard North

and decided to unveil their creation on the Gamecube. For ilar reasons, Soul Reaver 2 abandoned its PlayStation ro favour of its more capable sibling, the PlayStation 2.

Now picture yourself in the shoes of a gaming fan who the ditched platform... feelings of betrayal and angst course through your veins right about now. Owners

Dreamcast were bombarded wi such emotions when Sega deci discontinue its production. that were to appear on the Dre switched platforms, leaving a d bunch of gamers in the lurch. the heartbreakers were Valve Sof Half-Life and Crystal Dynamic

A more common reason for ing a game stems from its very 1 a game is a difficult beast to r The technical expertise required a project to the finish line as artistic touch needed to fuel its often not simultaneously p Thus a symbiosis of sorts has e in the gaming pond-the guy did well in maths make a grea engine, sell it to the literary ar types, who then attach a beauti aerodynamic chassis and a grea rolls out of the assembly line development studio. It is a proc





DAIKATANA: John Romero's favourite

child turned out looking more like a nightmare kid for everyone else

CHRONICLES Even after Lara Croft's death, the sequels just won't stop



The digital sequel to The Lost World—a monstrosity that should have stayed lost

arcade ■ games

without risks, as the developers behind the role-playing game, Torn, found out.

Black Isle Studios (BIS) had licensed the LithTech engine to power their ride to fame. It was then a solution undergoing birthing pains since several versions of the engine were being released with alarming frequency and BIS had a hard time choosing one version and sticking to it. Version changes at this stage of growth often force relearning of tools and this of course played havoc with timelines and the development cycle. The studio also faced technical difficulties while implementing a suitable path-finding algorithm and a flexible camera system, causing further slippage in the likely release date of the game. "Pathfinding was a huge, huge problem. We had a programmer working on pathfinding for

probably four months, and it never really worked the way we wanted. It got better, but it never worked well, which consistently killed the morale of the team. They could usually break the

pathfinding within a few minutes of getting a new build," explains Feargus Urquhart, director at BIS in a Gamespot.com interview. What did not help were the financial woes that Black Isles' parent company, Interplay, was experiencing. A reevaluation of the game project followed and Torn was scrapped.

Would you like some franchise with that?

Killing a game in its infancy, rather than letting it grow into something that a studio would not be proud of is quite justified. The big names in the gaming industry are built on franchises and are more comfortable dumping a product that might adversely stain a best-selling series.

3D Realms shot down Prey because they thought it was not up to their standards. So was the case with Maxis' Simsville. The game was designed to offer an experience somewhere between The Sims and SimCity. It was to retain some of the voyeurism of The Sims with more of the planning of SimCity along with some adult content in the form of crime, liquor stores and general seediness. Maybe the producers of the game thought that the direction in which the game was headed would have had a negative impact on this hottest of franchises (The Sims is the largest selling game on the personal computer) and the game was cancelled after more than two years into the development cycle. A spokesperson for Maxis stated that the game "wasn't up to the standards of the company, despite which, the team did a great job and is being reassigned to other products like The Sims Online and other future projects."

Not living up to the mark also saw the demise of a Blizzard title. After the success of Warcraft II, Blizzard North decided to release an adventure which would delve deeper into the Azeroth uni The game was titled Warcraft Adventures: Lord Clans. After over a year of development, whic a whole lot of animation work completed a good amount of voice acting done, Bli

> standards and the product was shelved. Bill Roper, producer of the game puts it "I think the fatal flaw in the project was th were a little too nostalgic. We definitely in fied a lot of very strong things from c adventure games, like strong characters, s storyline, excellent vocalisation and act and interesting, fun puzzles that tied int

storyline. I think that by that point we had ly fallen behind a certain technology cur the game came out, I think people would have bought i said, 'this is really fun, but this would have been great a co

of years ago'. And so it was an incredibly tough decision. B

knew that it wasn't going to meet the ext tions of anybody here and certainly no expectation of our fans."

> The work that the company did o adventure game was not completely ed though, some of the background and characters found their way int hugely successful sequel, the real strategy game, Warcraft III.



NOT FOR KEEPS: Dungeon Keeper 3 was shelved, as developers Bullfrog shifted their focus to the consoles

Symptoms of a Dying Game

A rule of thumb

When the developers of a game keep gushing, "...its too good to be true!", it probably is.

Will it be done?

The developers have been chanting, "When its done!" for the past three years.

Engine jumping

There is no game engine in the industry that the developers haven't tried.

Frequent changes in staff members

Most of the original development team of the game has guit and now posts flaming messages on the game's Web site.

Public assistance

The Web site of the game encourages you to make generous donations to the `Save the Developer' fund.

The vanishing

The developer Web cam has 'Out to Lunch' for the past six months.

The parting shot

Besides all the fun and party, development is big busine involves huge risks and r heartaches-the industry move frantic pace that blurs everythi sight, making even the near f unforeseeable. There are many t that can go wrong during the c opment of a game, a sad fact that credence to the industry joke 'behind every successful game l that did not make it'. What was pe a good idea to execute two year might not be as good today. If devel push their out-dated titles simply be they have hyped it, not only wil games end up holding coffee mugs. also risk scarring the developer's reput We can thus find some solace in th that it is better to have witnessed the cution of a promising game, rather watch the game grow into a mass of bug bad design decisions.

After all, which is the better of the evils—a developer that releases a sub-par that empties your pockets and then send scurrying after patches, or a developer that you with hype and then pulls the plug on a ect that had you craving for it? [

AHMED

Ghost Temple Your Kung fu is weak!

Ghost Temple is a 3D horror adventure game, which is made on the basis of famous Chinese ancient gods and spirits stories', or so claims the installation CD for the game. In this action-adventure offering from X Game Works, China, you play as the Chinese warrior, Yan Chixia, who must defeat all the evil minions to rescue a princess. The introduction video gives you a brief background, but unless you understand Mandarin or comprehend the English, you pretty much spend your time figuring out what you are supposed to do.

The game features a fixed camera angle that doesn't track character movement, but instead switches views when the character moves out of view. Not only does such a view hinder freedom during combat, it also makes it hard to ascertain



where your character is heading. The combat techniques are pretty ordinary, and you get the usual armoury of swords,

architecture populates this game

spells and fireballs. The graphics aren't much to write home about, though the backgrounds have been pre-rendered to perfection—this being the game's only saving grace.

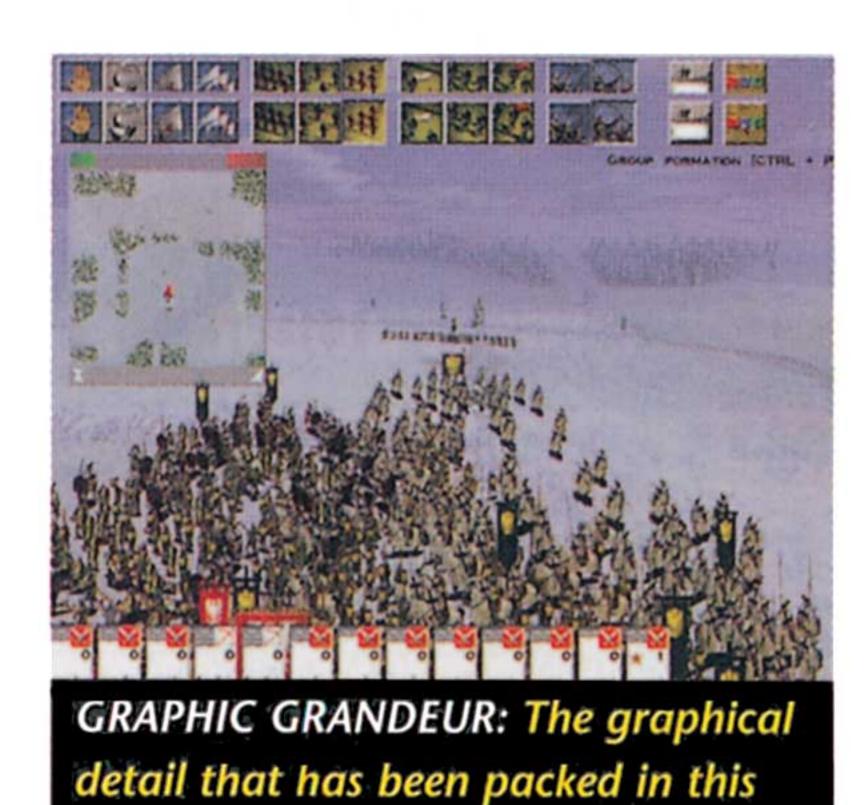
Moving on to the AI, the enemies are commissioned just one move: hit hero, animate, wait around and repeat. They don't even bother coming after you if you run away. Instead, they very conveniently disappear the moment you get off their area and reappear when you return. There is no mouse support for motion and the backgrounds get very monotonous as the game progresses. Suffice to say, this game would have been acceptable if it were made in the 1980s. So unless you're still stuck in the last century, pass this one and head for the Chinese noodles instead.

Minimum System Requirements: Pentium II 266 MHz, 64 MB RAM, 1.2 GB hard disk space, 4 MB videocard ■Genre: Action-Adventure

Developer: X Game Works ■Distributor: Aladdin Multimedia Pvt Ltd ■Phone: 022-7895085/7903959 ■Web site: www.xgameworks.com/ english/product/ghost/index.htm ■Price: Rs 490 ■Rating: ★☆☆☆☆

Medieval: Total War Total fun

Acates, Medieval:
Total War is set in
the medieval ages
and has its helpings of knights,
jihadis and commoners. The highlight of the whole
game is its interface. Featuring fullblown 3D graphics,
the game is played
and viewed in third



game is simply superb

person perspective. A standard 2D overview map lets you keep an eye on the big picture while focusing on a portion of the battle. The in-game gothic tunes and drum rolls add to the war and strife even as the hooves of your cavalry thunder across the screen.

In the single player missions, you have to choose a campaign—each

faction has particular traits that change the way a battle must be fought. Factors such as cost of living, agility, aggressiveness, etc, have been carefully factored to make campaigns nation-specific. There's even a Grand Achievement campaign in which you get to duplicate the feats from history. The multiplayer mode is just as fun with friends and foes joining the battle.

The effort has been to maintain a sense of historical structure, without letting history get in the way of a good time—and the game acheives that admirably.

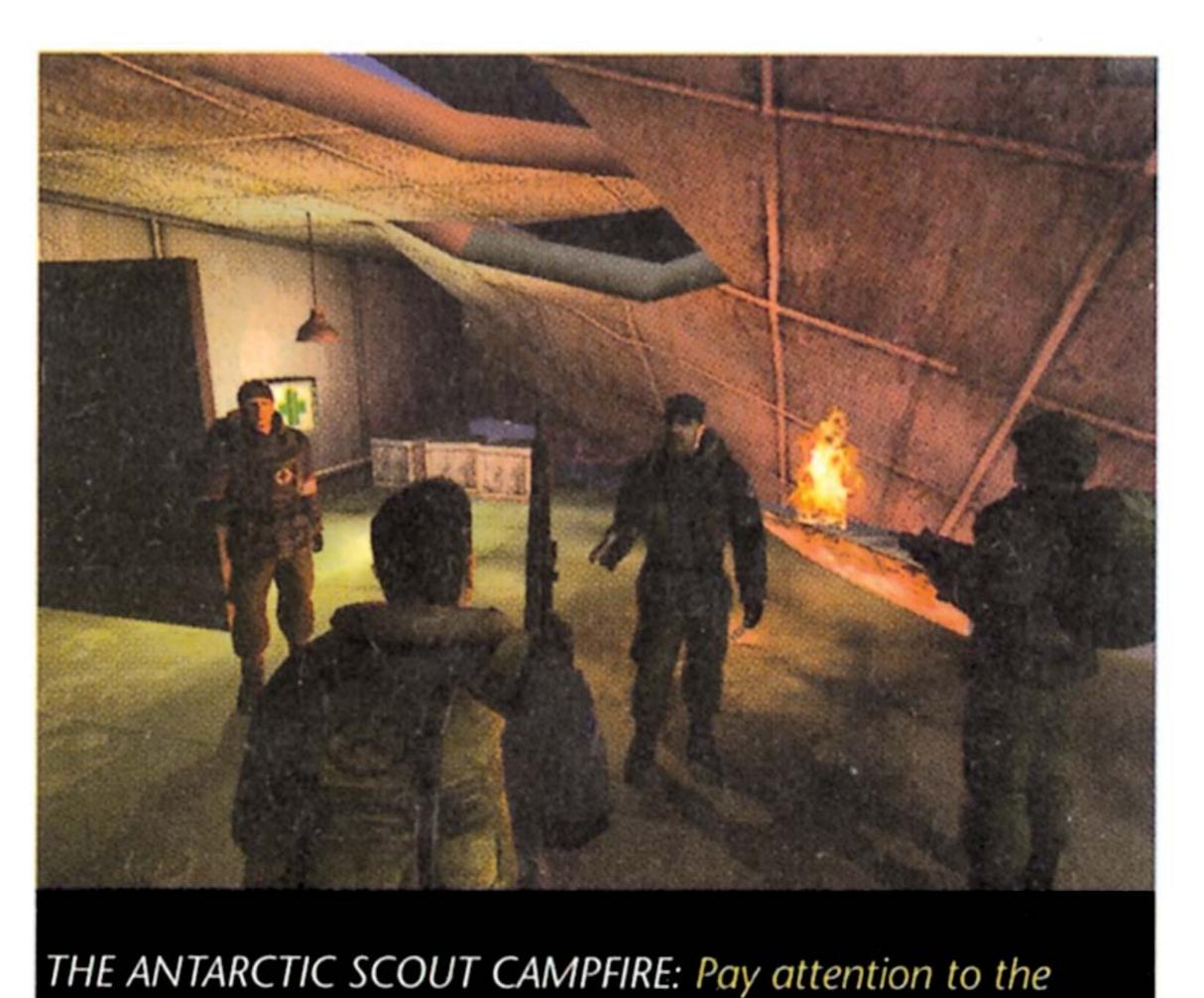
Minimum System Requirements: P-II 350 MHz, 128 MB RAM, 1.7 GB hard disk space, 16 MB 3D accelerator card ■Genre: Strategy Developer: Creative Assembly ■Distributor: Milestone Interactive ■Phone: 022-8381614 ■Web site: www.totalwar.com ■Price: Rs 1,999 Rating: ★★★★☆

arcade reviews



ased on the John Carpenter movie of the same name (a Kurt Russel starrer), The Thing is a third person action-adventure game. Following the disaster that ended the movie, you and your crack team are sent to investigate a scientific outpost in the Antarctic. This game succeeds in recreating the doom and gloom ambience of the movie. Although you play as a part of a team, good use of graphics and dark slow-filled environs lend a deep sense of solitude to the gameplay. The attention to detail in all aspects of the game is commendable—your feet leave footprints in the snow, flares correctly light up teammates faces and the use of good quality textures helps in suspending disbelief.

Trust forms the anchor point of the game. The key is to control your teammates and gain their trust while going through the regular motions of a shooter game—killing baddies (which come in grotesque forms, both small and gargantuan) and collecting health kits. To gain the trust of your comrades, you need to help them when they're hurt, provide



shadows and lighting, there's something to be learned here

them with weapons and ammunition, cover their backs and generally make sure that their needs (which are communicated with the help of emoticons) are fulfilled. A non-trusting member of the team might refuse to obey your order or even worse, turn his gun on you. Your teammates run the predictable gamut of

an engineer (to repair stuff), a doctor (to fix you up) and the gung-ho, trigger-happy type to watch your back. Clearing an area will require their services: the engineer will repair a power terminal to gain access to an area, for which you might need to gain his trust by administering some first-aid that only a doctor can provide, and so on. The teammates thus form a puzzle-like element of the game and lend it a very interesting and gripping play.

The game does tend to get mundane and repetitive as it progresses. A part of the reason being the snow-filled environ-

ment; besides the fact that monsters are a none-too frequent occurrence. So you spend most of your time doing mundane tasks such as hunting for keys and trying to gain access to the next room and so on. Although the elements that form the game are not very original, their execution is handled with much aplomb.

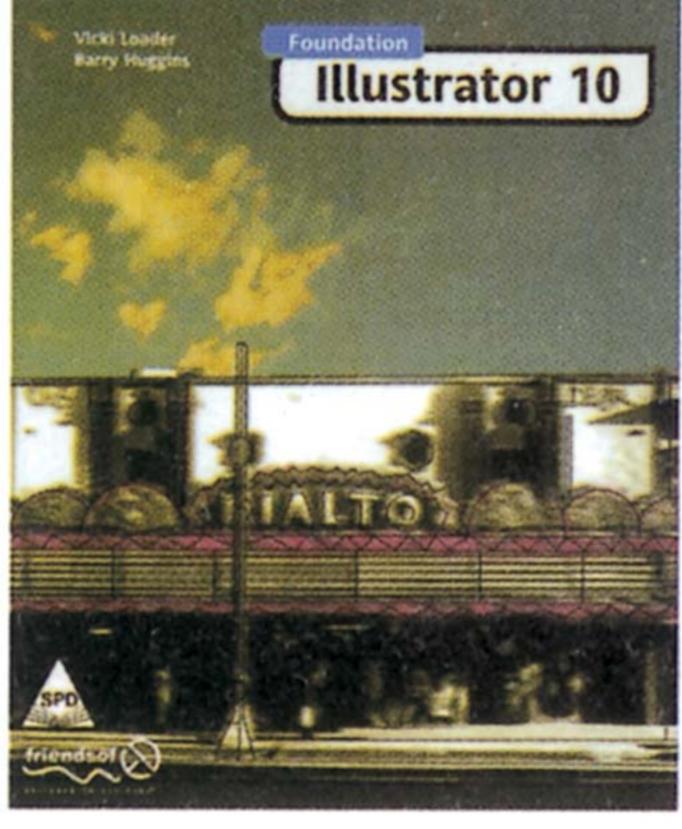
Minimum System Requirements: P-II 400 MHz, 64 MB RAM, 8 MB video card, 600 MB hard disk space ■ Genre: Action-Adventure Developer: Black Label Games ■ Distributor: Worldwide CD-ROMs ■ Phone: 022-6973894/95 ■ Web site: www.thethinggames.com Price: Rs 1,299 ■ Rating: ★★★☆☆



FOUNDATION ILLUSTRATOR 10

Hands on Illustrator

Coundation Illustrator 10, I as the name suggests, authoritative takes an approach at the latest enhanced version of Adobe's Vector Graphics, Illustrator 10. The book concentrates mainly on two kinds of users—those who are already familiar with the previous version of Illustrator and those who are looking for something to spice up their creativity.



The book takes you through the pro-

gram with the help of detailed step by step tutorials, accompanied by clear visuals. It covers efficiency-increasing areas like how to organise your artwork, techniques for bringing out the best in your creativity, benefits of using the said package and how to apply complex effects into your artwork. Each of the areas is explained with the

help of detailed illustrations. The book

also gives a hands-on examination of each tool in the Illustrator toolbox.

Foundation Illustrator 10 is useful for designers who perform multiple tasks and generate graphics to be effectively used in both, the print and the Web media. Photoshop users will also find this book informative in the area of vector graphics and can integrate it for more productive output. Overall, Foundation Illustrator 10 is an informative and descriptive buy for those already established in the profession and who are looking for a sprucing of their skills as well as those who want to step into the world of designing armed with know-how.

Publisher: Shroff Publishers & Distributors Pvt Ltd ■ Contact: Tata McGraw-Hill Publishing Company Ltd ■ Phone: 022-2076356/ 2072734 Fax: 022-2623551 ■ E-mail: cbsbom@giasbm01.vsnl.net.in ■ Price: Rs 375 ■ Rating: ★★★☆☆

arcade ■ digit diary

Wild things

From red Ferraris to fire brigades, all in a day's work

fast expanding group of fanatics calling themselves 'The Techies' have found their haven in the small city of Singapore. With its Sim Lim Square and Funan Centre filled with every conceivable kind of

SHA

Singapore has many forms of 'hardware'

gadget, the island of Singapore is enveloped in a Digital Droolmaal fog all year round. So when our Head of Writers, Marco, found out that he had to go on a three-day press visit to the Lion City, he quickly made a shopping list of all the toys he wanted to bring back. But what he didn't know was that there are some things you just can't fit into a backpack.

The hotel where Marco was staying owned a bevy of beautiful cars—everything from a Mercedes S320 to a Jaguar XJ12 to a couple of BMW 7-series—enough to give any car enthusiast like Marco a cardiac arrest. But what really stopped the blood in his veins was the sleek Ferrari 360 Modena—Sachin's car! When he got his breath back, he crept up to the car, half expecting the proximity alarm to go off. But the feline predator didn't attack, so he quickly whipped out his camera and took pictures of it

from every conceivable angle—even managing to get an under-the-hood shot! As he finally got out of his shutter happy mode, he let out a huge sigh and wondered how it felt to be Sachin.

Snakes at four

Our Nerul office had a surprise visit this month from one of our animal friends. During the lunch hour when everyone was herding down towards the canteen, a six-foot long grass snake slipped out from the dispatch section in the basement and made its way to the cafeteria. Now like Mother Nature, but a snake i purely vegetarian canteen was just bit unnerving. So John, our cafeteri tractor, swiftly called the fire br



Say Cheese! (watch that tail please!)

while the rest of our colleagues shout for Jiten, our in-house photogra Never one to miss an opportunity f perfect picture, Jiten clicked away firemen caught the unwanted visite secured him into a bag.

Will the animal activists please that we had bhelpuri for tea that Me and it contained no non-vegetarian tent, at least none that we knew of

Looking Within!

Ask anyone for a first impression of the people at Jasubhai Digital Media, and you will invariable hear comments like 'bunch of youngsters', 'technology zealots', even 'rogues'. But sometimes, even as we are on a do or die mission to catch those ever-elusive deadlines, deep existential questions occur to some of us. One such question occurred to Virdi, a coordinator with our Content Services team.

Before you think this is a plot for a Hindi potboiler, lets recap a bit. Louis, head of our magazines & Web sites division, and Anurag, the brand manager of ZDNetIndia, were having an informal discussion on different types

of personalities and how they affect a team. Virdi was a mostly silent observer and found the conversation extremely interesting. But a voice whispered deep inside him: "What type am I?" Always the one to convert thought to action, Virdi discussed this with others in the office and seeing that quite a few were interested in knowing more, urged Louis and Anurag to hold a formal training session that would help people understand their strengths and weaknesses and use them to the advantage of the team. Thus 14 volunteers picked a Saturday for the personality development camp. Everybody arrived at 9 am sharp for the daylong workshop, even

though it was the weekend. While there a liberal dose of *gyaan*, there were some prising revelations too. One of the exerci consisted of an exhaustive questionaire (along the lines of the Myers-Briggs Type Indicator). Almost everybody stated they were of the 'seriously intellectual' type (£ those who rarely let go an opportunity to monkey around)! All save Virdi, who mee entered that he was the 'laid-back' kind.

That was it. Now when anything g awry, there's always Virdi to put the bl. on. Ask Virdi and he'll tell you that's th last time he'll ever walk the path to sell discovery!



Great Writer

There was once a young man who, in his youth, professed his desire to become a great writer. When asked to detine great, he said, "I want to write stuff that the whole world will read, stuff that people will react to on a truly emotional level, stuff that will make them scream, cry, how! in pain and anger!" He now works for Microsoft, writing error messages

Submitted by Protheesh K. Neir

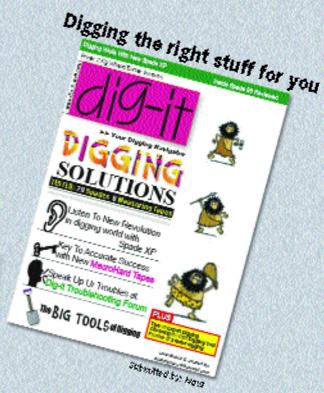
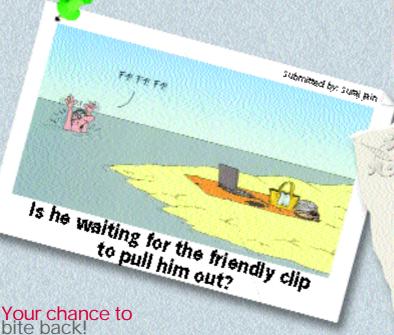




ILLUSTRATION: Mahesh Benkar



Highlight the lighter side of computing. Mail your contributions to: Backbyte Digit, Plot D-222/2, TTC Industrial Area, MIDC, Shirvane, Nerul, Navi Mumbai 400 706 or e-mail us at backbyte@jasubhai.com

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