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January 2003

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with **Steganography**



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you can't play in the dark



PLUS

10 Hot Technologies for 2003
3.0 GHz CPUs are finally here
Making Self-extracting Archives

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Selling Linux: Pull or Push?

The perception that Linux is still too difficult for the average computer user is the biggest challenge that Linux evangelists need to tackle.

Linux gained prominence at a time when it wasn't ready for mass consumption. A lot of people tried it during the late 1990s and were turned off by its quirkiness. It was simply discounted as a play-tool for geeks.

And this image still persists. But instead of confronting this, Linux supporters continue to tout every other aspect in order to gain converts: it's free, it's stable and it's secure.

Does it really matter?

All software is free in India. Okay, it costs 150 bucks. Given the current state of affairs, how exactly is this whole free angle going to make anybody bite? We're used to 'buying' the latest version of Photoshop for resizing our digital photos even when there are umpteen free tools available on the Net for this simple task. Yes, things might be different if we actually had to pay Rs 4,000 for a copy of Windows. But they aren't. Also, with the release of Windows 2000 and then XP, Microsoft has made bold steps in rectifying the bad poster boy image of Windows.

What's important is that Linux has come a long way from its humble beginnings. Most of its kinks have been ironed out and the rough edges smoothened. Sure it still needs to improve on driver support for new hardware, sort out certain compatibility issues with Microsoft Office and add a few features to its top applications such as Star Office and GIMP. But on the whole it's a viable desktop alternative to Windows.

What's needed now is to get users to try it once again. But without a centralised marketing push, it's naive to hope that everyone will see the light. The best bet then is to get top-tier system resellers to adopt and propagate Linux.

This has been made easier with the recent US Department of Justice ruling against Microsoft. The Redmond bully can no longer offer special incentives to its cronies or force any system vendor from adding non-Microsoft software to their PCs. Right now there's nothing stopping PC makers from bundling a free Linux CD or offering dual boot functionality. At the very least they can place a desktop icon for ordering a free trial copy of Linux.

This effortless seeding activity might be just the thing that's needed to popularise Linux and loosen Microsoft's stranglehold on us all. Plus it pays to support the underdog. If anything, it's the only way to fight complacency and drive innovation.



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Vinit Aggarwal
Assistant Editor

“What's needed now is to get users to try Linux once again”

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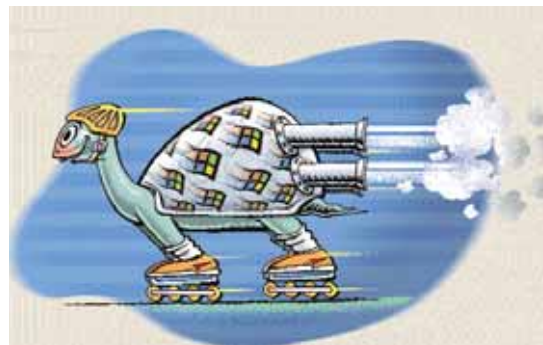
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ON THE CD



HIGHLIGHTS

Macromedia Contribute
Size: 17.90 MB, Type: Trial
Mindware\Software\Developer Tools

Holiday Lights 5.3
Size: 1 MB, Type: Trial
Mindware\Software\Home

Adobe Photoshop Elements 2.0
Size: 111 MB, Type: Trial
Mindware\Software\Multimedia

Tiger Woods PGA Tour 2003
Size: 63 MB, Type: Trial
Playware\Arena\Games

Jewel Cad 5
Size: 2.69 MB, Type: Trial
Mindware\Software\Multimedia

Cute FTP Pro 3.0
Size: 4.68 MB, Type: Trial
Mindware\Software\Internet

India Accounts for Windows 95/98
Size: 6.05 MB, Type: Trial
Mindware\Software\Office

Brave Dwarves 2 v1.03
Size: 4.9 MB, Type: Trial
Playware\Arena\Funzone

Registry Analyst 1.0
Size: 0.44 MB, Type: Trial
Mindware\Software\System

PFS Manager 2.03
Size: 6.75 MB, Type: Trial
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Acronis True Image 6.0
Size: 8.90 MB, Type: Trial
Mindware\Software\System

Need For Speed: Hot Pursuit 2
Size: 92.4 MB, Type: Trial
Playware\Arena\Games

ICUII 5.6
Size: 2.40 MB, Type: Trial
Mindware\Software\Internet



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MINDWARE\CONNECT

The Connect section on your Digit CD this month brings you Bookmarks on



sites which will give a glimpse into how people have celebrated the New Year. You never know, you might come across some real great experiences.

Also, in Connect find the Newsletter section which brings sample newsletters related to travel. The newsletters provide information ranging from travel news to people's travel experiences. So, the next time you want to plan a trip, you know where to get the dope.

MUST-TRY SOFTWARE

1Click & Lock

1Click & Lock is a system tray security utility you can use to secure your desktop when you are away from your PC. It's secure and very easy to use. Just define a password and select Lock to hide and deny access to your desktop to anyone who doesn't have the password. You can set the program to launch automatically with Windows, lock your desktop from the system tray, log access attempts, and apply a custom background image. When enabled, 1Click & Lock even allows visitors to your PC to leave messages for you. The cold-boot and boot key protection give maximum protection that's difficult to get around.

Size: 1.3 MB, Type: Trial
Mindware\Software\System



rendering effects, lighting effects, backgrounds, material settings, and motions. This truly is 3D animation made simple.

Size: 23.75 MB, Type: Trial
Mindware\Software\Multimedia

Battlefield 1942

Join the Battlefield in the year 1942 and experience the heat of the battle as you heroically storm the beaches of Normandy, drive a tank across the deserts of northern Africa, pilot a fighter plane during the Battle of Midway, or command a battleship at Guadalcanal or prowl the sea lanes for enemy subs! This is a unique first person team-based action game that places you right in the midst of a raging battlefield. You'll get to be an Allied or an Axis serviceman, and join in as a member of an assault team, or a



medic or an engineer, or it will be your job to knock out tanks. With a wide choice of historic WWII era weapons within your armoury, enlist and fight in some of the most famous and pivotal battles of World War II.

Size: 133 MB, Type: Trial
Playware\Arena\Games

Effect 3D Studio 1.0



Effect 3D Studio lets anyone create professional 3D animated graphics with hundreds of

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taste technology at <http://www.thinkdigit.com>

WEB SPECIAL



Burning issues

Are buffer underruns the bane of your life? Get over them and optimise your CD-writing process

HIGHLIGHTS

If you are wondering whether you want to buy the current issue or not, check out the highlights of the magazine.

Also, click on Mindware or Playware to check out the software on the CD



BY DEMAND



You get to choose what goes on Digit Interactive. This month, you have chosen:

- **Ringtone Converter 3.7.8** (4.3 MB) for Mindware
- **James Bond 007: NightFire** (147 MB) for Playware

Expect these on the February 2003 CDs

WEB SPECIAL

Virusproof forever

No virus, no Trojan, no worm, no matter how powerful, can get to you if you know how they work and squish them right at the entry point. Or even better, never let the entry point be insecure



VOLUME 3, ISSUE 1

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Printed and published by Maulik
Jasubhai on behalf of Jasubhai Digital
Media Pvt Ltd, 26 Maker Chambers VI,
2nd Floor, Nariman Point,
Mumbai 400 021, India.
Editor: Maulik Jasubhai
Printed at Tata Infomedia Limited,
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Cover Photograph Umesh Aher
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digit Promise to our readers

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news feed

DIGIT JANUARY 2003

hypothesis

CD Mount Rainer ReWrite format

■ What is it?

A packet writing technology that will allow optical disks to be written to and read from with the ease of floppy disks.

■ What does it do?

This standard allows CD-MRW disks to be formatted even while data is being written on the disk, thus saving time. The media can be ejected at any time during the format process—the drive simply picks up where it left off after the media is reinserted.

Fault management will be integrated into the drive hardware itself, instead of through the software as with existing standards such as UDF 1.50. These disks are proposed to have a 2 K addressing system (as opposed to the 64 K addressing system of floppy disks), resulting in a more efficient use of space.

■ What does it imply?

The CD Mount Rainer ReWrite format will facilitate easy reading and writing to optical media using packet writing technologies. Since it will be a standards-based technology, there will be universal compatibility between media and drives. With greater data capacity and reliability, this technology spells the death of the already obsolete floppy disk.

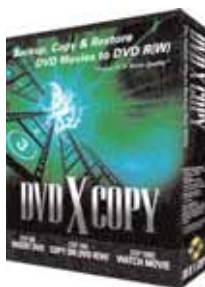
Perfect DVD copies

An American firm called 321 Studios has released a software program that can create mirror images of an entire DVD on a blank DVD.

Called DVDX-Copy, this program can duplicate the menus, special features and enhanced audio.

Hollywood's lobby group, the Motion Picture Association of America (MPAA) has stated that such products violate the Digital Millennium Copyright Act (DMCA), which outlaws tools to circumvent copy-control technology, including the

Contents Scramble System (CSS) used on DVD media. Facing possible criminal prosecution, 321 Studios responded by saying that consumers have a legitimate right to make backup copies of DVDs they own.



To appease Hollywood, DVDXCopy intends to introduce a unique digital watermark to enable tracing the DVD source, a disclaimer that the backup is for personal use only and, most importantly, electronic controls embedded into the DVD that prevent the copied DVD from being duplicated further.

E-mail invites burglars

After spam and popup advertisements, the Internet now aids a new malignance. Your e-mail could invite burglars to come and

clean your home while you are out of town. Crooks are now buying up huge e-mail lists

over the Internet and sending mass mail in the hope of getting autoreply messages that scream out 'We are not at home'. Smart thieves in the UK are using information within 'Out of Office' autoreply e-mail and are cross ref-

erencing this information against publicly available databases such as 192.com and bt.com that contain

names, addresses and telephone numbers. This makes leaving auto-replying messages equivalent to putting up a note on your front door, informing all and sundry about your absence.

The solution is clear—keep your messages bland, redirect enquiries to others or to alternate addresses and do not put personal contact information in your e-mail.



Illustrations: Farzana Cooper

Windows Refund Day

If you want a refund for any Microsoft operating system, your day has arrived. Come January 23, 2003 you can start litigation to get back your money from Microsoft, or from the manufacturer who sold you the OS with your computer.

So, who qualifies for a refund? If you bought a computer that came bundled with a Microsoft OS or if despite having an existing licence, you were forced to obtain another licence for a replacement computer, you can get your money back. But before you head off to a local courthouse, take a look at the licence agreement. You stand to get a replacement only if you can present the proof of ownership and all copies of the software, unopened! The idea is to hold computer manufacturers accountable for refusing to provide a refund for unused copies of any Microsoft OS. Needless to say, the movement has been spearheaded by Linux enthusiasts. Incidentally, this movement comes around in the same week as the Linux-World Expo at New York.

snapshot

Total cost of ownership of Linux could be as much as **22%** higher than Windows 2000

Source: IDC

Squeeze the cell phone

Saying it with a nice comforting vibration could well be the next way to communicate. MIT Media Lab is working on letting people communicate by passing along the 'touch' element. The Tangible Media Group, the research team at the Media Lab, says that the existing vibrator mode is too crude to actually convey subtle feelings. Hence they have come up with a proto-



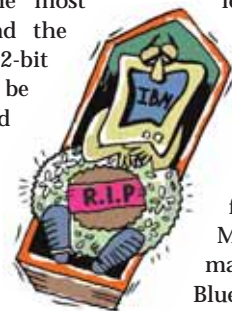
type design that features five tiny speakers that vibrate against the skin on the fingers and thumbs some 250 times per second.

Pressure sensors tucked behind the speakers let you vibrate the person right back. The intensity of the vibration depends upon how hard you squeeze. When test-

ing this on a group of students, they immediately used the technique to emphasise what they were saying, or to interrupt the other person. Over time, they managed to develop a distinct 'vibralangue' that added to the effect of talking on the cell phone. All the users found it extremely easy to work with and to get used to this. The idea is to let people transmit thoughts and feelings more effectively and also help people with disabilities communicate using cell phones.

Who killed OS/2?

OS/2, one of the most robust OSes and the world's first fully 32-bit graphical desktop will be declared officially dead by IBM on March 12, 2003, with support continued till December 31, 2004. IBM's support is considered an industry standard and their commitment to older technology is



legendary. Still, the move comes as no surprise—with IBM's inability to attract the hardware community to write drivers for newer devices, Microsoft stole a march right under Big Blue's nose by getting hardware support for Windows 95 right from its launch.

Block viruses

With computer viruses spreading through networks faster than the eye can blink, a researcher at the Hewlett-Packard laboratories in England just came up with a radical new theory—put the brakes on the infected computer to limit infection. Computers that are infected tend to behave differently than uninfected ones, says Matthew Williamson, the HP researcher.

The infected computer quickly tries to make as many connections as possible with neighbouring computers, through all possible network services, including e-mail. Throttling back the infected computer results in it taking a far longer time to start infecting other machines, giving enough time to alert system administrators to take necessary actions.

The idea worked amazingly well at HP's lab, during tests to try out this new theory. Incidentally, the limits imposed by throttling appeared to have no noticeable impact to the user of the infected computers.

redalert

Drive eraser

W32.Gall@mm is a mass-mailing worm that has the potential to overwrite all files on all drives that it can write to with 215 bytes of text. It is written in Visual Basic and its uncompressed size is 80,626 bytes.

The worm uses its own SMTP engine or Microsoft Outlook to send itself to all addresses that it finds on the infected computer. Multiple copies of the worm can be attached to the outgoing message. The message seems to have been forwarded from a Yahoo! account and talks about sex being illegal in the United States.

The latest virus definitions of most anti-virus software should take care of the worm.

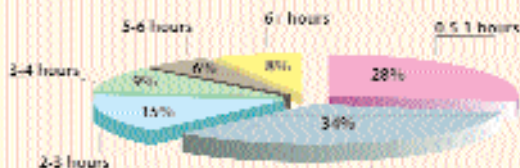
P2P Worm

This is a memory-resident worm called AGOBOT.C and it propagates itself through the KaZaa, Grokster and Bearshare file-sharing peer-to-peer networks and network shared drives. It regularly attempts to connect to an Internet Relay Chat (IRC) server as a bot. When connected, it may launch Denial of Service (DoS) attacks against other users. It also has backdoor capabilities and allows malicious users to take control of infected PCs.

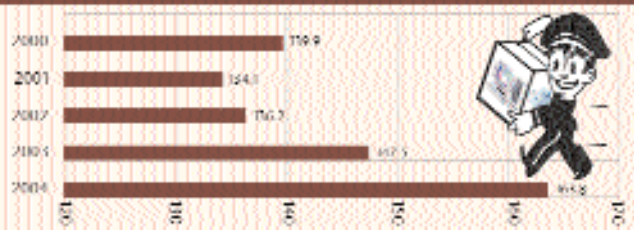
This worm infects all computers running on Windows and creates entries in the registry so that it runs automatically every time Windows starts. It can be identified and removed with the latest updates of most anti-virus software such as AVG or Norton AntiVirus.

statattack

Hours spent by IT professionals on internet research



PC shipment projections



Source: IDC

INFOGRAPHICS: Sachin Dalvi

Video game *Jen saves Ben* features Jennifer Lopez saving kidnapped Ben Affleck ■ Columbia Records Japan offers albums on demand burnt on CD-R

Super Gateway

The world's second fastest supercomputer has just arrived, and it does not stay in a lab. Gateway, the PC maker, has just announced that its 8,000 computers located at Gateway stores all over the US will now work, instead of hibernating.

After joining forces with United Devices, using their Alliance MetaProcessor platform, the 8,000 PC-grid based supercomputer is capable of an incredible 14 TFLOPs. Compare this with the world's fastest supercomputer yet, the Earth Simulator that clocks in at 35.61 TFLOPs. The next nearest number cruncher clocks in at a comparatively smaller 7.23 TFLOPs. This means that the Gateway/United Devices supercomputing grid, called the Platform On Demand (POD), is now the Number Two supercomputer on the Top 500 Supercomputer list.

The Alliance MetaProcessor platform protects the network with data encryption, firewalls and intrusion prevention methods and secure grid implementation. This secure supercomputer is available immediately for use to a variety of industries, including life sciences, geosciences, nanosciences, entertainment, financial services and more.

snapshot

Out of 29 advisories published by CERT during the first 10 months of 2002, Linux software accounted for 16 and Microsoft for only 7

Source: Aberdeen Group

followup

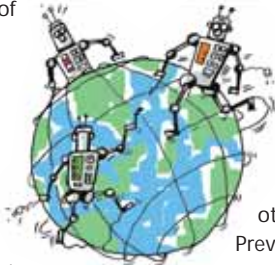
AI on the Internet

Artificial Intelligence will soon be everybody's cup of tea and you can be a part of the research for implementing AI. Researchers have finally conceded that the quest for AI is too daunting for a single group, and are looking at the formidable resources of the Internet for help.

World Wide Mind, a research team run by Mark Humphrys at Dublin City University, says that for AI to advance, the entire field needs to be democratised. To harness

the power of developers and novices worldwide, Humphry's team has developed an interactive program that lets them post their research on the Net for others to use.

Previously, AI research focussed on creating entire robotic systems that could 'sense' the world. But the new shift is in creating logical subsystems or modules, that are used in vision, navigation, locomotion, and problem solving among others.



Google for pinstripes

Google has now yet another distinction—it provides many Web-based businesses with a steady supply of customers. Numerous small Web-based service providers and entrepreneurs are now dependent on Google for their customer base. For example, if you were looking for yacht charters at the British Virgin



Islands, you could possibly end up looking up Bareboats-BVI, a site that gets most of its customers over from Google. The yacht broker does not end up paying anything to Google, but still relies on it for income.

Google uses many variables in its automated ranking process but the popular one bases its ranking on the number of sites that link to it. These links spell the number of endorsements. Google regularly shuffles

its rankings to reflect changes in its own methods or in the Web's link structure and content. This way, many small time independent businesses that would get lost in the World Wide Web, get fair exposure. But, Google can be very aggressive when it comes to customers using unfair means. Sometimes a site's ranking lowers dramatically or even disappears altogether if Google detects some evidence that the site's owner was using deceptive tactics such as building a network of linked sites to create the illusion of popularity and thereby receiving a higher ranking.

But the free lunch may soon come to an end—big businesses are spending more money into making sure that their site listings are optimised. Google doesn't make any money out of this—although sponsored site links are posted, these are not ranked, they appear as separate links.



heroes

Low-price PCs

Wal-Mart Stores Inc is offering a computer at \$199 (approx Rs 10,000) with neither Microsoft software nor Intel hardware. The Wal-Mart machines are full-fledged computers without Windows. Its sales, largely from technology enthusiasts, businesses and schools, are already exceeding expectations.

Robotics

Leif Askeland, an icon in the toy industry, has created a robotic lap cat named FurReal Friends that will appeal to retailers, parents and children. The furry robot purrs when petted and presses its face into your hand if its cheeks are rubbed.



zeroes

Microsoft applications

Sun Microsystems announced a deal on December 4, 2002, to install StarOffice on some European Sony PCs, marking another defection from dominant Microsoft products. Corel had earlier announced deals to put its WordPerfect software on PCs from HP and the North American wing of Sony.

eBay

Fraudsters are tricking legitimate users of eBay into handing over their identities to set up bogus auction accounts. The scammers rely on good ratings earned by the legitimate users to make their own bogus auctions look respectable.



■ ATI coming with R400, possibly with GDER 3 memory, by summer ■ Gateway ties with pressplay to offer 2,000 songs pre-loaded on new PCs

Moore's Law outlawed

Moore's law states that the amount of information storable on a given amount of silicon has roughly doubled every year since the microprocessor technology was invented. Andrew S. Grove, the Chairman of Intel, recently suggested that Moore's Law might be redundant by the end of the decade. The inactive Intel processors are leaking current, threatening the future valid-

ity of Moore's Law.

As chips become more powerful and draw more power, leakage tends to increase. Going by statistics, the industry is used to power leakage rates of up to 15 per cent, but chips constructed of increasing numbers of transistors can suffer power leakage of up to 40 per cent. Chips made up of a billion transistors may leak between 60 and 70



watts of power. The power is largely dissipated as heat, which causes cooling problems for powerful chips.

Currently, Intel is seeking ways to design chips with multiple cores with improved design and better insulators. The microprocessor giant intends to make more efficient use of the humble transistor in order to deliver ever increasing performance. In short, Moore's law is going to be upstaged by electricity!

Thought-provoking games

Researchers at the University of Boulder, located at Colorado in the USA, used video games to find out whether a cultural or racial stereotype could be linked to armed and unarmed males.

The subjects in the study were asked to shoot only when the human targets in the game

were armed; however, they typically shot at unarmed black men compared to unarmed white men. The video game showed photographs of males against a variety of backgrounds and asked the subjects to immediately conclude whether the image showed an armed or

unarmed man. The unarmed males had aluminium cans, cell phones, cameras and wallets. When asked to make a split-second decision, all the subjects concluded, mistakenly, that black men were armed.

The research helped establish that hidden cultural stereotypes exist in situations wherein the subject has to react very quickly and on instincts.



Over the hill

A 50-year-old computer called CSIRAC is still operational in Australia. This one-time state-of-the-art machine runs at a blistering 300 KHz, has 2 KB of RAM and 2.5 KB of storage. While the more rational among us may scoff at its utility, in its hey day this 7 tonne machine packed quite a wallop. Between 1951 and 1964, it worked with Australian universities on projects as diverse as calculating the design of water storage systems, weather prediction, Fourier analysis research and skyscraper design. CSIRAC also worked with Australian industry on studies for BP's Kwinana refinery, the Commonwealth Aeronautic Research Laboratory and was used by undergraduate and graduate students for research into programming.

snapshot

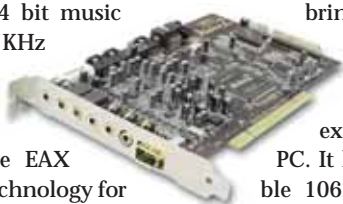
Online sales worldwide for Nov 1 to Dec 6, 2002, reached **\$8.2 billion**, up **29%** from a year

Source: ComScore

Drown in the music

Calling it the 'most definitive sound experience yet', Creative's Audigy 2 is a PC audiophile's delight. The Audigy 2's jaw-dropping specifications include 24 bit music fidelity with 96 KHz in seven channel surround sound. It also incorporates the EAX Advanced HD technology for truly immersive PC gaming experience and Dolby Digital EX compatibility, among others. Be it gaming or listening to

music, you can enjoy rich and realistic 6.1 surround sound. It utilises the breakthrough surround sound technology of Windows Media Audio 9, bringing in the next wave of home theatre-like experience to the PC. It has an incredible 106 dB Sound to Noise Ratio and the unique reputation of being the first and only THX certified add-in soundcard.



Amazon red-faced

Amazon's online store lets shoppers host recommendations for other buyers shopping for the same merchandise. Now, this technology, that tracks and links consumer perusal and purchases, has left Amazon red in the face due to its latest *faux pas*.

In early December 2002, Amazon users who were looking at a spiritual guide by well known Christian evangelist Pat Robertson were shocked to find a manual on sex rec-

ommended alongside. The incident clearly illustrates the pitfalls of online recommendations, which were hailed as excellent marketing tools. After receiving a complaint, Amazon promptly withdrew the recommendation. Unfortunately, this technology is easily manipulated by people who repeatedly shop, or just click through the links online. Analysts claim that this sort of incident will drive away existing and potential customers.



Controlling air traffic

A new technology called **FACES** (Free flight Autonomous and Coordinated Embarked Solver) allows planes to swarm the air and can prevent mid air collisions, regardless of the traffic. FACES is being developed by the Centre For Aerial Navigation Studies, France and lets pilots choose their own routes immediately after take off, instead of forcing them to fly a predetermined path. The software advises pilots to make manoeuvres only when absolutely necessary and maps out the best routes, saving on travel time.



The theory of distributed software is applied so no particular plane is ever in control, and they make their avoidance manoeuvres together. FACES has already been tested on a simulator using archived data on real air traffic and it successfully prevented a pile-up with 35 planes sharing airspace. The software sets the plan, keeping in account the flight plans of other planes that have already set it into sequence. Once the routes have been set, the pilots carry out the choreographed manoeuvres. This will result in the non-colliding routes.

snapshot

Wireless networking industry expected to bring in **\$2 billion** revenue this year, and estimated to grow by **30%**

Source: 802.11 Planet Conference

Archive your life!

In a curious twist of computing, Microsoft is creating a digital archive project where you can build a giant database of your life using the modern PC. Called MyLifeBits, the project aims to build archives that chronicle the events in people's lives. Add in all the photographs, home videos, audio recordings of conversations, letters and other official and unofficial documentation, and pretty soon, you should be able to run the equivalent of a Google search for any event in your



life. With data storage costs expected to come down massively, this could be feasible—calculate some 1,000 GB for 4 hours of videotape recording for everyday of your life.

This digital archive could be a boon for the archaeologists of a future generation trying to uncover our civilisation. While the security risks are pretty clear, an accurate, searchable store of events could help us preserve our experiences more vividly for posterity.

Internet buzz

Pinging a data packet to a remote computer and calculating the time taken to receive its echo is used to ascertain the reliability of the Internet connection. However, Chis Chafe, cellist and researcher at Stanford University, has modelled the Internet connection as guitar strings, twanging them to reveal those subtle characteristics that are

missed by pinging.

The time taken by the pulse to bounce back depends on the state of the network. The longer the connection time, the lower was the frequency range reproduced. This works such that any sudden loss of sound indicates a broken link somewhere or missing packets of data, thus revealing the jitter.

quoteworthy

"Companies throughout the country have networks that are wide open because of wireless LANs... millions of houses are getting connected, which means that more and more are getting vulnerable"

Richard Clarke, special advisor to the US President for cyber security

"Everyone can hear what you're talking about on the phone. When you're IM-ing, everyone can hear you typing, but it sounds like you're working."

Melanie Miller, staff assistant at the Massachusetts Institute of Technology, on

tomorrow's technology

Molecular photography

Researchers at the Oklahoma University in the US have invented a method to store digital information on hydrogen atoms. The inventors of this technology, Bing Fung and his colleagues, found that the 19 hydrogen atoms in a single liquid crystal molecule can be used to store 1,024 bits of digital information. The information is stored in the interaction of the magnetic moments of the protons

within the atoms and is related to the spins of the subatomic particles of the atoms. In initial experiments, they succeeded in encoding a 32 pixel square monochrome image in a molecule where the information was stored in a binary format. This was done by firing a set of 1,024 different radio frequencies at the molecule. Each of the frequencies either had an amplitude (representing a binary 1) or did not (representing a 0).

The information thus stored was read by firing a second pulse at the molecule having a slightly different frequency. Consequently, the information was read by measuring the changes in the interference patterns using a Nuclear Magnetic Resonance (NMR) instrument.

While this technology is still a while away from commercial viability, it promises big things for storage.

Eager to not serve

Dear Vinit,
Your December editorial hit the nail on the head—most of the companies in India, even multi-nationals, have taken the law in their hands and are only interested in selling their products: once an item is sold, the customer no longer exists for them. Cheers to you for raising this issue. I hope it will make companies get up and take a long hard look at their service policies.

Trevor
Via e-mail

Hi Trevor,
Yes, companies still take their customers for granted. And what bothers me most is that their frontline support personnel, who interface directly with their customers, are often the weakest links in the organisational chain. Also things get trickier in a country like ours where we don't have a 'working' mechanism of seeking compensation. Hopefully more and more companies will awaken to the fact that providing value to their customers is the only thing that

digit

Credit overdue

Dear Vinit,
In the news article titled 'What's in a Name?' in the November 2002 issue, Linux was addressed as "Linus Torvalds' operating system" and you mentioned that Richard Stallman wants it to be 'renamed' as GNU/Linux. The OS we know today as Linux was born out of the GNU project, conceived by Stallman in 1984. It is very strange how Torvalds, who only contributed in creating the kernel, is today considered to be the creator of the entire Linux system. The whole ideology behind the Linux OS remains concealed from the users—that of software created free, by and for the masses. In that context, I think there is complete justification in calling the system GNU/Linux to give credit where it is due.

Baishampayan Ghose, Free Software Foundation, India
Via e-mail

Dear Baishampayan,
While the collective work of GNU programmers was of paramount importance in conceiving Linux, the fact remains that singular personalities will often take the credit for a collective's blood, sweat and tears. Take the case of Microsoft—how many of us remember that Paul Allen was the co-founder of that company? Both Windows and the Redmond giant are synonymous with Bill Gates; piling credit on one individual may not be fair to others but it is a fact of life.

digit

Game interrupted

Dear Vinit,
I've noticed a disturbing trend where every new game demands even more system resources in order to run smoothly. In my opinion, if you are a true gamer then rather than constantly upgrading your computer system, you should buy a PlayStation 2 or an Xbox gaming console. All games for these platforms run smoothly and you don't need to spend money on 'upgrading' these consoles to play any new game. Also, most games released today have versions for the Xbox and PS2.

Sushant
Via e-mail

Dear Sushant,
Immersive graphics and multiplayer gaming are no longer the forte of the PC, with the current-generation game consoles having caught up in these departments. Therefore as you've rightly pointed out, if gaming is all you need to do, then buying a console makes more sense, especially considering that most games are now cross-platform. But you need not fall for the six-month upgrade cycle as no game developer is foolish enough to create and release a game that doesn't run on the majority of PCs sold in the last couple of years. Thus *DOOM III* when released, will run on a GeForce2-class graphics card, albeit without all the bells and whistles.

digit

Categorise this!

Dear Vinit,
'Brilliant' is the only word that came to my mind when I got the December issue in my hand. I reside in Colombo, Sri Lanka, and every month relatives coming from Chennai get the magazine for me. Digit is an extremely useful and informative magazine and I have gained a lot from it. I base my buying decisions on your test results and as such I was hoping you would test products from categories such as DVD-RWs, FDDs, LAN cards, projectors and dish antennae, among others.

Mohammed Ameer Sahib
Via e-mail

Dear Mohammed,
Whoa! Some of the categories that you have mentioned, such as DVD-RWs, are based on very nascent technologies and there aren't enough products available in the market to do a full blown comparison test. Others like LAN cards perform similarly, irrespective of brands; while floppy drives are simply dead. Even though we constantly try to add new product categories, I'm sure Digit will not be doing comparison tests on dish antennae in the near future.

digit

digit READER POLLS

Q. Would you replace Backbyte with a monthly technology quiz?

Yes	No	What's Back-
38%	54%	8%

Thankfully, Backbyte still finds a place in the magazine (and our readers' hearts)

Your vote counts

This month's question:

What more would you like featured in the 'Off the Shelf' section?

Log on to www.thinkdigit.com and vote on it

Saving data, one PC at a time

Hello Digit,
After reading the 'Data Watch' article in the November 2002 issue, I have successfully configured a backup solution on both my home and office PCs. Please pass on my good wishes to Mahesh Benkar for the wonderful illustrations that graced the article.

Jayanth Vasisht
Via e-mail



Illustrations: Ferzana Cooper

Dear Vinit,
Thanks to your 'Data Watch' article I was successful in recovering important data files, which I had mistakenly deleted. Also the graphics and illustrations in the article were simply superb. Keep it up!

Rasna Mehrotra
Via e-mail

Dear Rasna and Jayanth,
Accurate, efficient backing up and restoration of data is a very important issue that we hopefully did justice to within the story. And yes, we cannot discount Mahesh Benkar's design wizardry which was instrumental in bringing it to life; he consistently and pleasantly surprises us with his repertoire of design skills.

digit

No representation without taxation

Dear Sir,
I would like to add to your reply for the 'Strange Customs' letter on Page 29 of your December issue. I was recently checking up on the price of the Asus GeForce4 Ti 4200 Deluxe graphics card and found that it sells for \$150 (Approx Rs 7,500) on the Net, but is priced at an exorbitant Rs 18,000 in India! The local importer has a simple reason: "The product sells slowly and in low quantities. Thus if I don't charge a premium, I cannot make money."

Ajay Puri
Via e-mail

Dear Ajay,
Unfortunately, we live in a commercial world where businesses follow either the 'high volumes, low margins' or 'low volumes, high margins' model. Factor in some ridiculous custom duties and you're left believing that nobody cares for the sentiments of Indian consumers who simply want to get their hands on the latest hardware and are willing to pay the same price as their American brethren, purchasing power parity between

digit

Messiah of gaming

Hi,
I've been reading Digit for a long time and you guys are doing a tremendous job. Now I have another reason to celebrate: *Skoar!* I read an ad in the December issue and I'm really excited about it. Can you give me some more details?

Vinodh
Via e-mail

Hi Vinodh,
Well, if you like playing games then there's plenty to celebrate about. *Skoar!* will be hitting news stands in January 2003 and will be the fountainhead of the latest and greatest game reviews, breaking news on the hottest upcoming games along with loads of cutting edge digital paraphernalia. Not to mention the fact that there will be three, yes THREE, CDs full of the coolest game demos and addons you can get

digit

A bundle of joy

Dear Editor,
Every special issue of Digit brings with it some truly explosive packaging that simply blasts away any other national or international technology magazine. The packaging of the December 2002 issue reveals a unique blend of artistry and innovativeness crafted with intricate precision. Plus the concept of distributing the Six Essential Handbooks in a separate, specially designed pouch is especially praiseworthy.

Arindam Sarkar
Via e-mail

Dear Arindam,
We did plan on doing something extra special for the December 2002 issue. But it took more than just plain hard work; a few 'unplanned' mistakes and serendipity were big contributing factors in the final design of the packaging as well. In the end we're glad you

digit

Short Bytes Great issue!

Dear sir,
Your December 2002 issue was simply irresistible. The 100+ Tips & Tricks CBT was especially mind-blowing. Three cheers to the Digit team!

Krishna Kumar Khatri
Via e-mail

Price not justified

Dear Vinit,
I am a regular reader of your magazine, but your December 2002 issue disappointed me in terms of the price—Rs 150! The price tag is not justified at all.

Souvik Sinha
Via e-mail

Goof Ups

We also need to swallow a bitter pill with all the bouquets we've received for the December 2002 issue. We messed up the contact details for quite a few products:

■ On Page 76, the Logitech Cordless Freedom Optical has been incorrectly priced at Rs 3,380. Its correct MRP is Rs 6,950

■ On Page 135, the price of *Age of Mythology* has been incorrectly listed as Rs 1,299. It is actually priced at Rs 2,535. Also the game was developed by Ensemble Studios, is published by Microsoft and the Web site is www.age-of-mythology.com

■ On Page 135, the book reviewed is not *Foundation Illustrator 10* but *Director 8.5 Studio*

■ On Page 66, the contact details of Macromedia Dreamweaver MX have been incorrectly stated as Wipro Infotech Enterprise Software Group, when they should have been Macromedia

■ On Page 48, the contact details for the Gainward GeForce4 card are incorrect. Contact Mediatech India at 2936696, 2014083 or

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

The Power of Kaii



Devesh R. Agarwal, Managing Director, Infomart (India) Pvt Ltd

// We wanted to develop an intelligent, low-cost and flexible handheld computing platform that would serve as an engine for a variety of vertical applications //

With miniaturisation emerging across every form of technology, it comes as no surprise that there has been tremendous advancement in the field of portable computing over the past year. Ultra portable Tablet PCs and powerful handhelds are getting closer to the end user with enhancements in fabrication technology and faster, more power-wise processors. This trend is exemplified in India by the announcement of the Simputer, bringing portable computing closer to the masses.

The newest device to hit the Indian handheld computing scene is the Kaii, an indigenously developed handheld that boasts robust processing power, affordability and a high level of configurability, making it suitable across a varied cross-section of application areas. We spoke to the developers of the Kaii. Following are excerpts from an e-mail interview:

■ **What was the inspiration for Kaii?**

The idea originated in August 2001. We wanted to develop an intelligent, low-cost and flexible handheld computing platform that would serve as an engine for a variety of vertical applications. These include a PDA, inventory, e-governance, ticketing, GPS, etc.

■ **What is your vision for Kaii?**

The Kaii is a multi-purpose handheld computing platform, which can serve a variety of market needs and applications. It has always been our vision to make the platform available to both hardware and software developers and original equipment manufacturers (OEMs) who can take it to new markets by applying their own unique ideas and skills.

■ **What are the advantages offered by Kaii apart from the obvious advantage of cost?**

Kaii is not merely a PDA. Its biggest advantage is its flexibility, USB Host control and state-of-art power management. Another unique feature targeted at larger OEMs is the concept of mass customisation, where the OEM can choose the hardware and software components. No handheld manufacturer has offered this concept before. The existing Palm and Pocket PC devices offer only a USB client, while Kaii has both, host and client. Through the USB Host, external USB devices such as the mouse, keyboard, hard disk and printer can be connected. For instance, when the Kaii is coupled with an 802.11b Wi-Fi card, an OEM can offer a special purpose corporate workstation for under Rs 15,000. This workstation can be complete with all

office automation software, an e-mail client, a world standard Web-browser and a Sun certified Java Virtual Machine. Companies such as Insurance and FMCGs can equip large sales forces with a Kaii, loaded with their custom applications. This can be carried to client locations, the orders taken on the spot and the person can upload the orders to the corporate ERP using Wi-Fi when he or she returns. The Kaii can also be included in the handheld GPS receiver, e-books and information kiosk markets.

■ **How does it compete with other PDAs in functionality and power?**

In the PDA avatar, the Kaii offers all the power and multimedia features of a Pocket PC. Like Palm OS and Microsoft Pocket PC, the standard software includes MS Office compatible software for word processing, spreadsheets, presentations, a Web browser, an e-mail client and a Sun certified Java Virtual Machine. Feature wise, KAIi is highly competitive as against a Palm or any model of Microsoft Pocket PC. It also has many games such as *Asteroids*, *Tetris*, etc., and software to sync with MS Outlook. It has a CF card slot, a Multi-Media Card (MMC) slot and infrared. Additionally, the Kaii is 'world ready' due to its double-bit ability and has language packs for most languages available either for free or for a charge from the vast Linux community. In addition, the USB Host expands and extends the Kaii PDA's functionality.

Most companies sell their PDAs at low price initially and then cash in on the proprietary accessories. A Kaii owner is given many non-proprietary and hence, inexpensive choices.

■ **What kind of response has it received? Do you plan to take it to foreign markets as well?**

We are overwhelmed by the kind of interest generated. It was designed for the global community of which India is a part. We took a lot of inspiration from India in the diversity of applications required, as well as the cost competitiveness required. Kaii is a platform for people to bring their ideas to fruition. Its concept has generated interest from all corners of the world.

■ **Who is your target audience?**

In the PDA avatar, the audience is those who seek value for money. As a platform, it is for all the hardware and software developers, and OEMs who have a unique idea and need a platform to help bring it to fruition. ■

As communicated to Marco D'Souza

HOT TECHNOLOGIES IN 2003

Three years into the millennium, and we stand on the verge of yet another persuasive wave of technology as it entwines itself into the very fabric of our lives. What was once considered high technology is now accessible to a vast cross-section of users, ranging from teenagers to grandparents, as much as it is to technologists and scientists. We are used to an infusion of gadgets that have made themselves indispensable—be it cellular phones, ATM cards or ready access to the Internet. Let's take a look at some of the technologies that are going to be instrumental in furthering this acceptance of technology in our day-to-day lives. **d**

MARCO D'SOUZA

The wire-free network

While high-speed networks draw on all the advantages of your office Ethernet, high-bandwidth wireless networks spell untold levels of convenience and portability. With 802.11b (WiFi) networks already in place in many parts of the world, and present in numerous home and office networking equipment, there's no looking back. The 54 Mbps bandwidth of such networks provides adequate room for data-hungry applications such as streaming audio and video and high-volume file downloads. Also, the capability of providing up to eight discrete channels in the specification lets the network handle different types of data streams. While there were speed breakers in the shape of slow acceptance for the 802.11a standard and compatibility with other wireless standards, today, both the 802.11a and 802.11b standards can be merged into a single device. Another hybrid variant of the 802.11x standard is the 802.11g, which boasts of bridging the gap between the 802.11a and 802.11b standard, enabling them to talk to each other. On the horizon are other exciting wireless standards such as Ultra Wide Band (UWB) wireless communication. With its significantly higher levels of security, UWB is likely to gain wider recognition and acceptance in the forthcoming year.

Communication unlimited

Cellular technology already has a strong foothold in our daily lives. While speech is still the main medium for cellular networks, many upcoming technologies are built to open the doors to newer forms of media such as audio and video broadcasts, videoconferencing and advanced messaging systems. While devices that support these technologies are still beyond the reach of most users, it is just a matter of time before this technology becomes widely accessible.

GPRS is among the most significant cellular technologies this year. It is gaining acceptance among service providers as well as end users. With the ability to handle data transmission at a maximum of 144 Kbps, this technology is a taste of the potential of a handheld device to deliver more than just voice communication. This year, expect to see the proliferation of GPRS-based networks along with the advent of newer standards such as EDGE, which marks an entry into the 3G realm of 2 Mbps cellular bandwidth.

While these standards will take time to stabilise and reach the user, there will be a consolidation in technologies where standards such as Wideband Code Division Multiple Access (WCDMA) will unify cellular communication standards, making data, voice, videoconferencing and multimedia messaging a part of everyday life.



Processing powerhouses

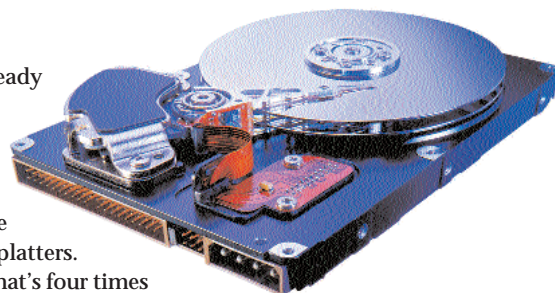
Pulsing at the very core of our systems, processors have grown in strength to become massive number-crunching devices. Not too long ago, the prospect of having a computer that could allow you to create and edit your own video on your home computer was unheard of. But today's processors are more than able to handle power-hungry applications such as real-time audio and video processing, and bleeding-edge games with smoother levels of multitasking.

The year 2003 will see a slew of processors armed with higher clock speeds, advanced fabrication processes and newer technologies to tackle new-age applications with greater ease. AMD and Intel are going to herald 64-bit computing with their new processors aimed at the desktop and server segments. Aided by technologies such as Baniya and better fabrication processes such as 0.09-micron technology, manufacturers will be able to pack in more transistors into processors, resulting in greater features and capability and higher integration of components. Besides the desktop computers, advances in processor fabrication will be reflected in handheld devices too—with clock speeds of up to 400 MHz, handheld processors will break new ground in portable power without sacrificing on battery life.

Storage unbound

The storage field has seen a lot of excitement in the past year. Hard disks already offer as much as 300 GB capacity and the bar for even entry-level drive capacities has been raised—the end of 2002 saw 40 GB drives paving the way for 60 GB ones. In 2003, advancements in fabrication technology will allow for even larger capacities to be integrated into the same form factor and price range. New technologies such as IBM's Pixie Dust allow the fabrication of devices where smaller magnetic domains can be reliably created and retained on the hard disk platters. This allows the disks to have storage densities of up to 100 billion bits per inch—that's four times the present capacities! You can look forward to hard disk drives with capacities beginning at 400 GB and notebook drives with up to 200 GB capacity!

On the optical drive front, Blue Ray is all set to redefine optical storage where standard 8 cm optical disks will boast of a 27 GB capacity. With many manufacturers already equipped to produce these drives, the only await is for the standards to support these technologies to be finalised. Another promising technology that is making its present felt is Recordable DVD drives. Given its superior storage capability and falling prices of hardware and media, this will become very popular.



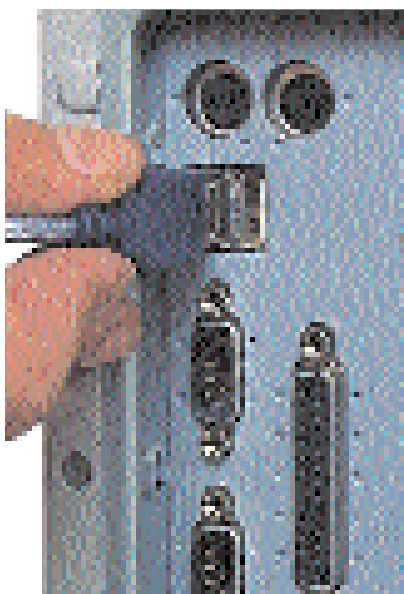
Operating systems

The code that runs our desktops, servers and operating systems has seen a visual metamorphosis over the past year, with increasing stress on better looking and more intuitive interfaces. Things have changed under the skin too, with stronger protection against external threats, faster networking and support for new hardware. Through it all, the familiar 'desktop' metaphor has remained with the folders, recycle bin and wallpaper.

While there is no sign of breaking away from this metaphor, upcoming OSes will offer greater levels of stability and interfaces. They will also serve as a platform for unifying new-age applications such as audio and video editing, better media file management and a better broadband experience. OSes will also move into the

64-bit realm to complement the arrival of 64-bit processors and applications.

On the desktop front, Microsoft's new OS, codenamed Longhorn, boasts of a brand new interface, a powerful new database-like file system, support for Palladium technology, as well as provision for 3D hardware for a more realistic and visually rich interface. On the Linux front, the launch of United Linux assures compatibility and higher ease of use. Other distributions of Linux will also focus on the end user where user-friendliness will be enhanced. The OSes for mobile devices will also change to offer stronger multimedia support—the upcoming versions of Microsoft Pocket PC 2002 and Palm OS 5 support faster processors, full audio and video.



Connectivity

Apart from the processor and the motherboard, peripherals and other system components are also getting faster and are demanding greater levels of bandwidth from interfaces—both internal and external. While the year gone by has seen advancements in the speed of interfaces such as ATA and USB, this trend will continue with greater performance through innovations in the design itself.

Serial ATA is one such standard that will make a big appearance this year—with a 150 MBps bandwidth, this interface is faster than any existing IDE interface we have today. To corroborate this fact, there is no future roadmap charted out for the parallel ATA standard. Since Serial ATA uses thinner connecting cables, there will be far less clutter in your system with greater cooling and therefore, more stable performance. Several hard disk manufacturers have already launched hard disk drives based upon this standard.

On the external front, USB 2.0 took time to gain acceptance during the beginning of 2002. Compared to USB 1.1's paltry 12 Mbps bandwidth, USB 2.0 features a bandwidth of 480 Mbps allowing for fluid operation of devices such as DV cameras, external storage devices, scanners, etc. With strong support from manufacturers of motherboards as well as peripheral devices, you can look forward to the USB 2.0 interface peripheral devices.

The visual realm

Advancements in graphics processing hardware have made cartoon-like game characters a thing of the past. The buzzword today is visual computing and this is apparent from the current generation of games, conventional application software and operating systems. With today's OSes drawing on the capabilities of the graphics processor for even rendering a shaded and bevelled scroll bar, our entire experience with computers is moving closer towards a visual realm.

In the race for launching the fastest graphics card, the two bigwigs in graphics processors, ATi and nVidia, are going all out on the promotions and enhancements. This is supplemented by the fact that even upcoming graphics APIs such as DirectX 9 and OpenGL 2.0 boast of capabilities that will bring cinema-quality graphics to your computer. The year 2002 has already given us a taste of things to come with ATi's Radeon 9700. This year, we will witness some more powerful graphics solutions with products such as the GeForce FX and ATi's upcoming R10000 graphics processor.

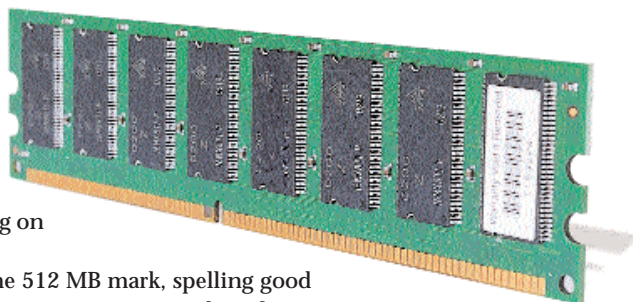


The memory angle

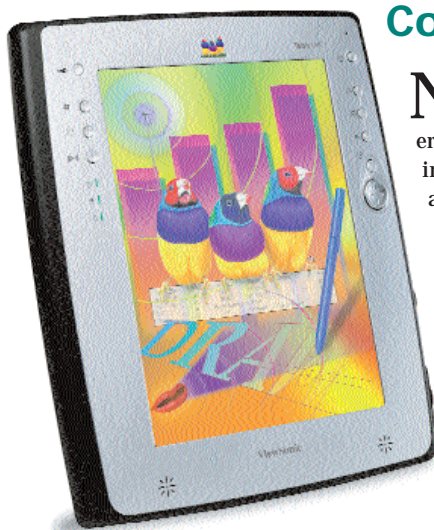
After the processors, probably the single most important component that spells computing performance is the memory. The past year has seen rapid advancements in the memory scene—the RDRAM and the DDR camps have been churning out faster modules with denser capacities.

While both have gained acceptance, the future clearly stands in favour of DDR memory. It has been very visible in the AMD and Intel platforms and its newest iteration, DDR2, is poised to be the memory platform of choice for both Intel and AMD. Making its way to this market is the DDR-III, which yet again promises to provide a worthy complement to the forthcoming processor platforms with bandwidths ranging from 6.4 GBps all the way to a blistering 25.6 GBps—faster than the PC4300 DDR2 memory bandwidth of 4.3 GBps. This year will see DDR-III appearing on motherboards across the Intel and AMD platforms.

On the topic of density, these RAM modules have already touched the 512 MB mark, spelling good things for the server and enterprise segments. However, with future operating systems and application programs demanding greater amounts of memory, greater densities will also mean lower costs per module.



Computing to go



No longer is the desktop the only place to get work done. The newest slew of handheld devices—cellular phones, Tablet PCs, handheld devices and new-age notebook computers—have seen advancements in processing power, battery life and storage capacities, resulting in an array of fairly advanced capabilities. Cellular phones such as the Sony Ericsson T68i and Nokia's Communicator are prime examples of this yet unrealised potential.

This year will see an explosion in devices that let you take your communication, documents and even Internet on the road with you. Devices that incorporate imaging capabilities such as the Sony Ericsson P800 will be widespread in this year. Handheld devices based on the Windows Pocket PC and Palm platform have already demonstrated support for seriously powerful processors with full imaging, audio and video capabilities.

In 2003, also watch out for the emergence of Tablet PCs—the next mobile computing device. Delivering high levels of user-friendliness and functionality, Tablet PCs, along with forthcoming cellular and handheld devices will revolutionise mobile computing.

Display advancements

They've been around for the longest time—CRT monitors are trusty devices that have lasted all through the years, with very little of the underlying technology changing. However, LCD displays, once the devices of the privileged, are now within our budgets due to enhancements in fabrication processes and yields. With all the advantages of smaller footprints and greater brightness and contrast levels, LCD technology is fast catching up on the price and resolution front as well. The year will see the arrival of LCD displays that are affordable, with screen sizes in the 14 and 15-inch range.

One of the display technologies to look out for is Organic LED. Displays based on this technology eliminate the need for a power source for backlighting, spelling significantly lower manufacturing costs along with higher contrast and brightness levels. Its response time will be about 1000 times that of present-day LCDs—no more blurring even when viewing fast-moving images or large displays!



Xentex FLIP-PAD Voyager ►► Your complete companion

The portability of a laptop with the power and workspace of a desktop—the Xentex FLIP-PAD Voyager is a device that offers just this. This unique device with its foldable design provides an unprecedented viewing area with a dual screen work environment. Woven around an 1.2 GHz (also available in 1.6 GHz) AMD Mobile Athlon processor, 512 MB of RAM, a 40 GB internal hard disk with an 80 GB swappable hard disk, dual 13.3-inch TFT screens that offer a total resolution of up to 1536x1024, this mobile device offers workstation-class and touchscreen functionality. It has four USB ports and FireWire, along with integrated Ethernet and modem. If you miss your graphics workstation while in transit, this laptop will keep your productivity levels up.

Web site: <http://www.xentex.com/voyager/>



Hot Stuff!

Gadgets that
complement
your style.
Go ahead,
Show off!



◀◀ Ellula Inflatable Speakers Not just hot air

These inflatable speakers from Ellula radiate sound from their surface, which makes them omnidirectional. They come in three funky shapes, one of which is even shaped like a Budweiser beer can! Since size is not a factor, these speakers make the perfect accessories for your mobile presentations and portable audio player. They bring along a battery pack, an adapter and an amplifier. If you want all ears, these are the speakers to pack.

Web site: www.inflatable-speakers.com

Nokia 3650 ►► Keeping us connected

Nokia departs from the norm once more, incorporating a completely new design while infusing technology and functionality into the 3650. At its heart beats a GPRS cellular phone that supports data transfer speeds of up to 40.2 Kbps and runs the Symbian OS, which can run Java-based applications and games. It sports a crisp 176x208 pixel colour display that can play MPEG-4, Real Audio, Real Video, WAV and MIDI formats. It also features SMTP and POP3 e-mail access. Additionally, it has a built-in camera that can capture 640x480 colour images that can be sent to other users if the network service allows it. The 3650 contains 4 MB of internal memory and is also Bluetooth and infrared capable.

Web site: www.nokia.com



◄◄ Sony PEG-NX70V Clie Power palm

Sony's new handheld stuffs fistfuls of functionality into an intelligent clamshell case. Sporting a 200 MHz StrongARM processor, this Palm OS 5-based device supports digital video (MPEG-4) and audio playback, a voice recorder and an expansion slot for wireless network connectivity. It incorporates expandable 16 MB of RAM and the integrated camera can capture 640x480 resolution images with its 3,10,000-pixel sensor. Say bye-bye to tinny sounds, as this handheld features a speaker that can produce polyphonic alarms and reminders that can be user-recorded. With its 320x240 colour screen and full multimedia support, the Sony PEG-NX70V is the handheld to trust your data with style.

Web site: www.sonymstyle.com/micros/clie/



Creative Nomad Jukebox Zen ►► Nirvana on the move

If you thought hard disk-based MP3 players were bulky and awkward, think again—Creative's new Nomad Jukebox Zen incorporates a whopping 20 GB hard disk drive in a device small enough to fit into your pocket—around 5,000 MP3s can be stored at 128 Kbps! This sleek player integrates a FireWire port and a USB port. The device can store songs in categorised playlists that can be easily and speedily accessed through the scrolling button and intuitive icon-driven interface.

Web site: www.nomadworld.com/products/jukebox_zen/



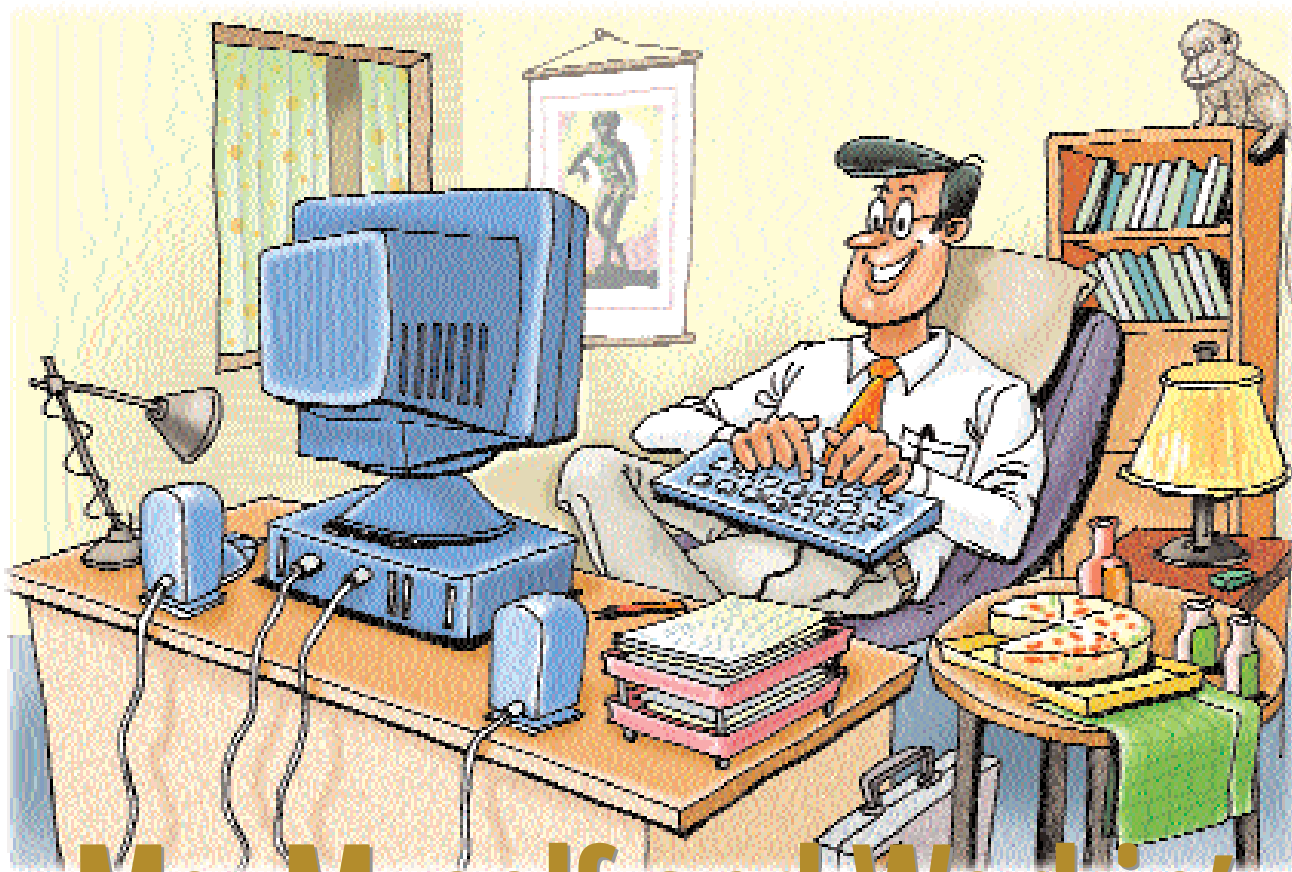


ILLUSTRATION: Mahesh Benkar

Me, Myself and Workin'

Long, hot hours of travelling, difficult work environments and slave drivers are all passé. Be your own boss, work in the comfort of your air-conditioned, music-filled room and make big bucks!

Do you want to break free of the corporate world, skip the coffee machine and step off the rumour mill to contribute to the economy on your own?

The latest trend of freelancing is more conducive to an independent worker. With cities growing in every direction, much of one's time is spent in commuting. Strict work routines, tyrannical management and the temptation of better opportunities around the corner have many of us thinking of a life of work at home.

The idea of working for yourself sounds sweet, but there are a lot of things to consider before you set out on your own. The primary one is whether your

work gives you that kind of freedom. Certain jobs, by their very nature require you to coordinate with a team. While the Internet has made communication easier, it does not do away with all the barriers. The IT and media industry, however, offers great scope of working from the confines of your home—copywriters, writers, network consultants and Web designers thrive professionally in their own habitat.

Players on the field

Amith Ellur, a certified Microsoft consultant, has been freelancing for various companies for the past six years. His work ranges from setting up a smooth workflow process to simple database opera-

tions. His work hours and fees depend upon the nature of work. The reason he chose to freelance, Ellur says is, "If you are an employee, people recognise the company you belong to and not the individual; if you are a freelancer, people recognise you and your work."

Chandan Naik, a layout artist, has another reason to be in the freelancing game. He lives in Borivili, a far-flung suburb of Mumbai, which makes his travelling time go up to anywhere between 2 and 3 hours in any direction to get to work. This is a large chunk of his waking hours, considering that his job would involve late nights. Moreover, his workload would usually avalanche during a certain time period, instead of being

// Freelancers are entrepreneurs by themselves, so they have to keep learning and updating their knowledge to provide quality solutions on time, everytime //

—Amith Ellur, Microsoft Consultant

spread evenly over a month. Sailesh Peringatt, a programmer, prefers to freelance for the interest quotient. It allows him to pick and choose interesting jobs. "This way, you tend to learn and grow very fast in terms of knowledge as you are not limiting yourself," says Peringatt.

Such a work scenario may mean professional schizophrenia—where you are a copywriter in the morning, a technical writer in the afternoon and editor in the evening—but it assures intellectual stimulation. For Naik, it means working on a large spectrum of magazines. Diwali usually means working on special editions of Marathi magazines, while year-ends see him working on IT publications. Each magazine has its own style and focus and this diversity is what keeps Naik intrigued.

Since working on your own takes away one very big advantage that a corporate house offers—that of frequent training sessions that keep one abreast of the latest trends, freelancers have to rely



Amith Ellur
MICROSOFT CONSULTANT

// The advantage for me over an employed individual is that I can play different roles at all possible levels **//**

upon themselves to update their skills and knowledge. "Most of my free time is spent learning new languages and processes so as to handle any kind of project," says Peringatt. Ellur agrees: "Freelancers are entrepreneurs by themselves, so they have to keep learning and updating their knowledge to provide quality solutions on time, every time."

Another thing an independent worker can't fall back on is a support system. Corporate clients have well-drawn legal con-

tracts that can be quite daunting to a newbie. While such paperwork assures that the freelancer isn't exploited, it can also be used against the individual worker in case the work is not delivered on time or isn't up to a certain quality. "Corporates are well-equipped to handle freelancers who don't deliver quality. A freelancer is most of the times a one-man show with no legal assistance, whereas corporates have access to virtually everything. So if a freelancer doesn't deliver quality, the client can stop payments and also get legal clauses in the way. Not to mention, that they can give you a poor recommendation, which will hinder your future projects," explains Ellur.

Independent working doesn't necessarily translate to working from home. Just like in a 9-5 job, the client is the king and your work habits rotate around him. The type of project you are working on decides your location of work. "Most of the times clients don't want the project details to go out of the office boundary,

The Website Story

'Now you can work on your own terms'... or so they say

The Internet is brim full of Web sites that claim to offer big money with minimum work hours. But like everything else on the Net, many of them are just database mining sites that require you to sign up for a fee or pay for the training pack. The exact nature of the work is ambiguous. But some offer genuine solutions for those sitting at home.

Some Web sites offer data processing jobs such as converting books or PDF formats into online documents and other text conversion jobs. Other jobs include medical transcription, which involves receiving dictations of medical notes and then transcribing that data into a digital format and rerouting it to the respective doctor. These jobs require you to have some kind of scientific or medical background to aid your understanding of the scientific terms. Other work opportunities include basic data entry, replying to e-mail, receiving mail responses, pursuing helpdesk on mail and chat. This is quite on the lines of a Call Centre.

Some sites offer to pay for just click-

ing on advertisements to assure advertisers of user response. Given below are some sites that let you work from home:

Elance.com (www.elance.com) is a work-from-home site. As cited by one end user, for a particular project you might have to pay Rs 6,000 towards registration, but at the end of it you could earn up to Rs 15,000. Even though you have to pay a certain sum at the commencement of a project, this amount is usually recovered by the end of the project.

Guru.com (www.guru.com) gauges your potential and directs you to the right job.



Elance.com is one of the popular choices of freelancers



Guru.com has a team of experts that evaluates your potential

The mode of payment can be chosen between a monthly salary and an hourly rate. They have a 'Workstyle at a glance' section, which is designed to help the user and the staff learn more about the preferred work environment. Once your skills are assessed and you've entered the cycle, it is fairly easy to find the right kind of work. Make sure to read the clauses associated with each type of job.

Datamatics.com (www.datamatics.com) is one of the pioneering work-at-home sites in India. However, a previous user

hence you have to make use of their resources,” explains Ellur. Naik, on the same note, needs to coordinate with the editorial team of the magazine he works on and hence is required to be at the client’s workstation. But Peringatt, being a programmer, can work from his home. His typical hours are from 11 am to 6 pm and then again from 11 pm to 3 am. “The most productive hours are during the night with absolutely no disturbance. Also, the Net is quite fast then,” he explains. But he generally prefers to “work till I drop, as I’m working for myself. It is very important that I finish work as soon as possible, so that I can move on to other interesting stuff”. Naik has a better work discipline. His work rotates around the other people in a given team and hence it isn’t completely at his convenience, though he can choose a particular project depending on his personal ability to handle it.

Show me the money

The crucial concern any individual set-



Datamatics.com is a meeting ground for both clients and service providers

complains that the site no longer offers the opportunities it initially did. Some unpleasant experiences by a few users prompted them to quit, but there are others who continue to be influenced by the concept.

Many of these sites operate worldwide, but the vendors handle currency conversion and the user is paid in the local currency. Most of them require you to pay a registration fee as deposit, which is refunded once the job is done. This fee is a precautionary measure to assure delivery on the scheduled date. In case you do not submit work at the designated time, the compensation would be reduced. This is where you need to be cautious as most of these services have a ‘do so at your own risk’ clause.

ting out on his own faces is that of money. After all, money is the reason most of us are in it. A regular job ensures a salary deposit in the bank at the end of the month. With freelancing, the work-to-pay ratio is always negotiable and never assured. How one discusses the pay packet again depends upon the nature of the work: Naik prefers to be paid by the day as it works very well with his work scenario since he is required to work from the client’s site for unpredictable hours, with focus more on the quantity of work rather than the quality. For Ellur, charging depends upon the project specifications and the customer comfort. “In cases where the customer himself is not clear about his requirements, it is advisable to charge by the hour where the specifications are frozen on a daily basis. When the customer is clear about the output, you can charge a lump sum,” says Ellur.

Peringatt, on the other hand, charges for the work put in and not the hours spent working, “so I don’t have to keep reporting to the client on how much work was done in a day, as I may be working on other parallel projects.” He continues, “Sometimes, charging by the hour is not justified. If the developer is skilled and has experience, it will take him much less time to finish the project compared to an inexperienced developer who would take months to research. An umbrella amount takes care of all these factors. The client is informed of a date when I will be able to present the demo or the deliverables and that date is adhered to.”

So how much can you hope to make on your own? And is this payment assured? Peringatt has had many distasteful experiences in this regard—“Getting money out of the client is a big headache. The money invariably gets delayed for some reason or another.” But Ellur begs to differ—he maintains that clients pay, at even a premium, provided that you deliver quality on time. A novice freelancer can hope to earn between Rs 10,000 to Rs 15,000 in any field, depending on the kind of contacts he or she has and the quality of the work. A seasoned IT consultant, in the opinion of Ellur, can make anything from Rs 30,000 to Rs 1,00,000 a month. A layout artist can make around Rs 7,000 throughout



Sailesh Peringatt
SOFTWARE PROGRAMMER

“I am my own master; I only do things that interest or challenge me”

the year and up to Rs 15,000 during the end of the year and festivals when magazines get out their special editions.

Bag of tricks

What you need to work on your own, besides a PC with all the peripherals of your trade, is a good database of contacts and people who will give you work. If you’ve already been working for a while, people are already familiar with your work and the trust hurdle is bypassed. Once the ball is set rolling, each project well delivered will ensure future work, as work relations with freelancers are based on trust. In the words of Ellur, “Being a freelancer, if you have five satisfied customers, then you are assured five more job offers for the future.” You can also tie up with a Web site online that trades services with companies that are on the lookout for them such as www.elance.com and www.freeagent.com. These sites are meeting points for those who are seeking specific professional services and those who can provide them (see box, ‘The Website Story’).

The availability of projects, like in any other profession, depends on the overall economic scenario and your own skill sets. The key is to constantly reinvent yourself and keep abreast of the skills and technologies in your field. Along with that, you need to cultivate a firm discipline and mark out your work hours. Always understand the nature of the project to its last detail so that there are no misunderstandings that could wash away hours of your work. With that, also calculate a rupee per work unit ratio that you can justify to your client—you don’t want to come across as exorbitantly priced, nor should you sell yourself short in anyway. Once you have these few things in place, all you need to do is work hard and the money will keep streaming in. ■

RACHANA SANGHANI and MITALI PAREKH

How we Test



In Test this Month

A new year and a whole new set of technologies on the horizon! In this New Year's issue, we bring you some of the hottest technologies and products over a range of categories. In our comparison tests, we have a shootout between 10 laser printers in the sub-Rs 30,000 category from six different brands. If you've always wanted to buy a laser printer but were under the impression that it would cost a lot, this is the shootout that will help you with your decision.



We have also reviewed a cross section of some of the funkiest input devices comprising of six keyboards, 10 mice and four keyboard-mouse combinations featuring some of the newest technologies like dual optical sensors, wireless connectivity and even unifications of the two! Be it gaming, image editing or even general use, find the keyboard and mouse that suits you best.

In the Bazaar section, we bring you reviews of the hottest products such as Intel's newest Pentium 4 3.06 GHz with HyperThreading technology. There are also a set of digital droolables here, with the funky and feature rich Fuji S602 Zoom digital camera and the lightweight and incredibly portable Creative MuVo portable MP3 player. Don't forget to check out peripherals such as the Canon Canoscan LiDE 20 scanner and Iomega's newest 48x24x48x external USB 2.0 CD-Writer.

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

The 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 hardware, software and technology services in accordance with the most up-to-date evaluation processes and methodologies used around the world.



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!

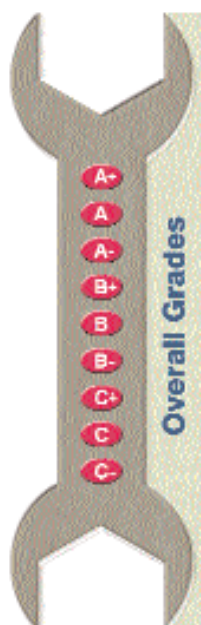
Comparison Tests

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 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



Laser blazers

Who needs a laser printer? The answer is quite simple: if your daily work routine involves printing a large number of sheets for office use and more importantly, you need the printouts real fast, then you need a laser printer. If you are not satisfied with your old inkjet printer and are thinking of upgrading to something better and faster, and something that still fits your budget, then you need a laser printer. To make the choice easier for you, we test 10 laser printers costing less than Rs 30,000.

Looking for a workhorse of a printer capable of churning out pages fast, in bulk and cheaply? We test 10 laser printers that cost less than Rs 30,000—Go ahead! Bring one home

When it comes to choosing a desktop-level laser printing solution, you must be asking yourself some questions. Like, will it fit my budget? Will it be able to print fast enough? What will the image quality be like? Well, these questions should not worry you much because laser printers have evolved from being bulky, unglamorous pieces of hardware lying in a remote corner in your office to aesthetically pleasing products that offer fast printing speeds and great image quality. Laser printers today are capable of crystal clear printouts at up to 100 pages per minute—ideal for situations where you need bulk printing at a continuous flow. To make the choice easier for you, we test 10 laser printers costing less than Rs 30,000.

Laser printers also have a number of advantages over other printing technologies—they produce superior quality documents (both text and graphics, in monochrome as well as colour) and the cartridges are also longer lasting compared to their inkjet counterparts. Couple this with the fact that you can use a laser printer over a network, and you have a cost-effective printing solution for applications where many users use a shared resource to print from.

Getting your hands on a printer of your choice should not be a big problem. Industry bigwigs such as HP, Samsung and Epson have kept the buyers interested with their impressive product line. What's more interesting is that together with overall quality, manufacturers have also started concentrating on small but nifty features such as the LCD display, the inclusion of the USB and the Parallel ports, the inclusion of a network port and paper tray holders with one-touch adjustments.

If you are still not convinced about buying a laser printer, we test 10 such printers under the Rs 30,000 mark. Go ahead and make your choice.

Digit Test Process

We tested the laser printers on a test machine comprising of a Pentium 4 running at 2.8 GHz on an Intel D850EMV2 motherboard with 256 MB of RDRAM. We used a GeForce3 chipset-based graphics card and a Seagate ATA 4, 40 GB, 7,200-rpm hard disk which was installed on the primary IDE channel. The monitor used was the Samsung 75E and a generic CD-ROM was used for installing the drivers. The hard drive was clean formatted and Windows XP was installed. The printer drivers were loaded on to the OS after connecting the printer under test. Once the test on each printer was completed, its drivers were uninstalled. The onboard USB port was used for all printers that featured the USB interface. For the image quality test, the resolution was kept at a default 600 dpi.

Test methodology

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

Features: We looked for usability features such as the type and number of buttons/controls, LCD display provided and indicators if any. We also checked the build quality and noted the default paper capacity. Another important feature was the toner price—we calculated the cost per page keeping in mind its estimated print life. Apart from this, we also considered the documentation provided by the manufacturers such as quick start guides and the comprehensiveness of the manuals and other documentation.

Performance: We evaluated the speed, quality and bulk printing efficiency. To test a printer's speed, we ran three tests. In the first test we printed an image file three times and noted the average time taken.

Next, to check the speed of text printouts, we recorded the time taken to print 50 pages of text in a Word document. Finally, we printed a Combi document in PDF format and the time taken to print a single page was noted. We also performed a bulk-printing test where we printed 50 pages of text and checked if there were any paper jams or multiple sheet printouts.

To test the quality of the printouts, we printed our test image file and a sectional analysis was done on the printout where we noted the level to which details were captured in pre-defined areas of the printout. This was done for both the image file as well as the Combi document. For checking the quality when printing text, we used a document containing text with varying font sizes. The sentence that we used contained all the alphabets from the English language in both upper and lower case. In this test we looked for any misaligned or blotchy text and awarded higher points to printouts that were accurate and readable.

Warranty and support: Here we looked for the type of warranty provided, the number years for which it's valid, the number of service centres present in the country and the number of cities in which they are present. We also checked if the warranty provided is comprehensive and whether a replacement is provided during the warranty period.



This greyscale image was used for testing the print quality of the laser printers. The image contains a good mix of fine details in different zones of the printable area. For instance, the area near the leaves gives a good indication of a printer's ability to pick up details

Jargon Buster



Bleed: The region of the page that is beyond the marked area within which printing usually occurs.

Buffer: Memory within the printer that stores data from the computer until it can be printed. Buffers vary in size, with the average for laser printers being around 8 MB. Greater the buffer, the better the handling of large print jobs.

CMYK: CMYK stands for Cyan, Magenta, Yellow and black and is a shorter version of the industry standard term, 'four colour process printing'. By combining these colours, a printer is able to print all possible colours. Most full-colour prints that you see are created by this method (magazines, brochures, retail packaging, etc).

Colour Balance: This term refers to the correct combination of Cyan, Magenta and Yellow required to exactly reproduce the colours of the original scene or object

Dpi: Short for Dots Per Inch, this is a measure of the vertical resolution of the printer. Higher dpi values (1200 and above) produce sharper printouts, while lower dpi values (300 and below) produce images that have noticeable dots in them.

Duplexing: This refers to the ability of a printer to print on both sides of a paper. This is a very handy way of saving on paper. However, this option is neither cheap, nor common. An alternative is to use manual duplexing. In this method, you print the odd or even-numbered pages first and once the job is completed, you manually flip the pages over and the printer prints on the other side.

Interface: This is the type of connection that the printer has with the computer. Older printers use the parallel interface, but this has become obsolete. The latest printers use either USB or FireWire connections as their interface.

LASER: An acronym for Light Amplification by Stimulated Emission of Radiation, this is a process that produces a very intense light beam. In a laser printer, this beam is used to fuse the toner, or ink, onto the paper.

PostScript: This is a computer language or protocol used for communication between the computer and the printer. The computer sends information about the pages to be printed by the printer in PostScript format.

1/2 page Ver. AD

How They Fared

Laser printers are capable of churning out large volumes of printouts with impressive quality. These workhorses have long been the mainstay of huge corporations because of their ability to deliver quality and speed, and now, with prices having gone down, they are a fairly viable option for use at home and in a small office.

Features

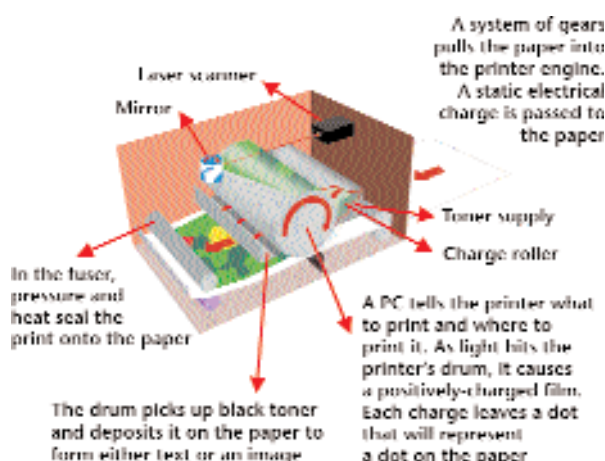
When it comes to features in laser printers, the equation is simple: the greater the number of features it supports for easier paper handling and usage, the higher the points it gets. This includes a paper in and out tray, an LCD display, a USB port along with the mandatory parallel interface. It should also support as high a resolution as possible within the price range and preferably, it should have visual indicators for paper empty, paper jam and so on, which would facilitate easier usage of the printer. Lets take a look at which of the printers did well in these areas.

Under the Bonnet

Before a laser printer can start printing, it needs to have all the information about a page in its memory. Where information about the image to be printed is communicated to it via a page description language (PDL), the printer's internal processor first converts the instructions into a bitmap, which is stored in the printer's memory, to be later reproduced on paper.

At the heart of the printer is a small rotating drum—the organic photo-conducting cartridge (OPC)—with a coating that allows it to hold an electrostatic charge. First the drum is given a positive charge and then a laser beam scans across the surface of the drum, selectively imparting points of negative charge onto the drum's surface that represents the output image—every point on the drum corresponds to a point on the sheet of paper. In the meantime, the paper is passed through an electrically charged wire that deposits a negative charge onto it. The laser beam is then turned on and off as it scans the rotating drum, using a complex arrangement of spinning mirrors and lenses. The mirror drum spins incredibly fast and is synchronised with this on/off switching of the laser. A typical laser printer will perform millions of switches every second. Inside the printer, the drum rotates to build one horizontal line at a time—the smaller the rotation, the higher the resolution down the page (the step rotation on a modern laser printer is typically 1/600th of an inch, giving a 600 dpi vertical resolution rating and in some of the latest printers, this resolution even goes up to 1440 dpi. Similarly, the faster the laser beam is switched on and off, the higher the resolution across the page. As the drum rotates to present the next area for laser treatment, the written on area moves into the laser toner.

Toner used for printing mono is very fine black powder, positively charged so that it is attracted to the points of negative charge on the drum surface. In colour printing, it could be either a CMYK or RGB used individually or in a combination. Thus, after a full rotation, the drum's surface contains the whole of the required black image

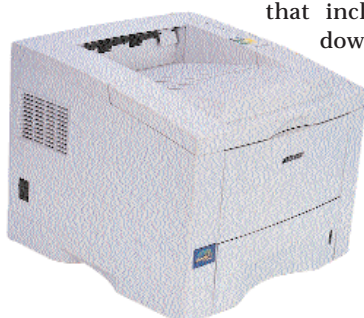


for mono printing or any varied settings for colour.

A sheet of paper now comes into contact with the drum, fed in by a set of rubber rollers. The charge on the paper is stronger than the negative charge of the electrostatic image, so the paper magnetically attracts the toner powder. As it completes its rotation, it lifts the toner from the drum, thereby transferring the image to the paper. Positively charged areas of the drum don't attract toner and result in white areas on the paper. Toner is specially designed to melt very quickly and a fusing system now applies heat and pressure to the imaged paper in order to stick the toner permanently. The drum is then cleaned of any remnants of toner either by mechanically scraping the drum or by covering the drum with an even electrical charge so the laser can write on it again.

For managing the printer for a longer run, the felt pad which cleans the drum and the corona wire, needs to be changed regularly.

Resolution: While buying a printer you should first define your needs. If you need a device for printing documents at the maximum possible quality, you should go in for a printer that supports the maximum resolution (1200 dpi and above). A 1200 dpi printer will give you the capability to print high-quality monochrome images or complex documents that include many details. The only



With its high resolution of 1200 dpi, the Samsung ML-1450 is a good choice for crisp and clear printouts

downside is that these high-resolution printers are anywhere between 25 per cent and 60 per cent more expensive than their 600 dpi counterparts. You can opt for a printer with a lower resolution of say, 300 dpi, if you don't intend to print documents at extremely high quality and if you need a cost-effective solution. Out of the 10 printers that we received, six supported a res-

olution of 1200 dpi, the remaining ones supported a resolution of 600 dpi. The six high-resolution printers were Canon LBP 1120, Epson EPL-5900L, HP Laserjet 1200, Lexmark E322, Samsung ML-1450 and Wipro Laser 1540.

Interface: Most of the printers connect to the PC through the popular parallel interface. But now manufacturers have also started to produce printers with the USB interface and some even provide a USB and parallel interface in combination. If you own an older machine that does not feature a USB interface, a printer which has only a parallel interface will suffice, but if you own a newer computer that features a USB port as well as parallel ports, a USB printer is preferable. All the printers in the comparison sported a USB port, but the HP Laser 1000 used a USB-to-parallel port interface and, integrating the old with the new, the HP Laserjet 1200 featured the USB 2.0 interface in addition to a parallel port. **Paper capacity:** One must also consider the paper capacity of the paper-in tray. The Samsung ML-1450 offered a mammoth paper capacity of 550 sheets. This printer does not support the option for manual feed, but that is hardly of any concern while buying laser printers. This one is a great option if your print jobs are large in quantity, where you would not want to be bothered with having to fill the paper tray too often.

The next highest tray capacity in this comparison was of 250 sheets. The printers that offered this included the Canon LBP 1210, the HP Laserjet 1200, the Laserjet 1000, and the Wipro Laser 1540. The printer that supported the lowest tray capacity was the Canon LBP 1120 with support for 125 sheets—however, this was also among the lowest priced printers in this roundup.

Toner price: Cost is always a primary consideration when buying any product. A printer's cost effectiveness depends on the cost of the product plus the cost of printing a page. The lower the cost per page, the better. To check this, we calculated



The Epson EPL-5900L provides good value for money due to low running costs

the price of the toner in relation with the specified life of the toner.

Here the HP printers come out tops. Printing on any one of these printers, be it the HP Laserjet 1000 or the Laserjet 1200, will cost you just 88 paise per page. If running cost is of concern, these printers would keep your expenditure to a minimum. The Epson EPL-5900L also provides good value for money, where printing a

document will cost you 93 paise. This value is very close to that of the Wipro Laser 1540, which delivered printing costs of 95 paise per page. The printer that offered the lowest value as far as toner price is considered was the Lexmark E322. Here printing a document would cost you Rs 1.74.

Accessories: An important feature that most manufacturers miss is the inclusion of an interface cable (either USB or parallel). Hunting for an interface cable after purchasing the printer can be a very time consuming and unwelcoming task. Here the Canon LBP 1210, Epson EPL-5900L, the Lexmark E210 and E322 and the Wipro 1540 scored over the others by providing the respective interface cables.

Documentation: It always helps if a manufacturer provides a detailed user manual that is lucid and simple to understand. This is especially applicable to the quick setup guide—by referring to this quick start guide, a user can easily get the printer up and running in the least possible time. The printers in the comparison that did not provide a quick start guide were the Canon LBP 1120, the HP Laserjet 1000 and 1200 and the Lexmark E322. All the other printers included a quick start guide.

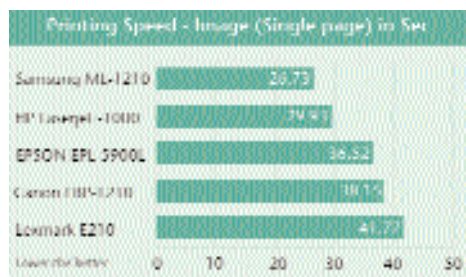
Build quality

Here we noted the build quality of each printer in specific areas such as the sturdiness of the paper feed tray, paper-out tray and toner flap—all three areas have moveable parts and are handled the most. All the printers featured good build quality in these areas. The only exception was the Wipro Laser 1540—though it has a good build quality, we found the paper-in tray to be somewhat flimsy.

Performance

In our performance tests we checked the printers for speed and quality. To judge the speed of the printers, we printed different file types such as image, text and combinational documents including text and graphics.

Speed: In the speed tests, we first printed a TIFF image document and noted the time taken. In this test, the Samsung ML-1210 came out tops, logging just 26.73



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CATEGORY	LASER PRINTERS					
	Canon LBP 1120	Canon LBP 1210	EPSON EPL-5900L	HP Laserjet 1000	HP Laserjet 1200	Lexmark E210
Features						
LCD display (Y/N)	N	N	N	N	N	N
Indicator lights	Power	Power	Power	Power, Paper jam	Power, Paper jam	Paper out, Error, Ready
Resolution (dpi)	1200	600	1200	600	1200	600
Interface	USB	USB, Parallel	USB, Parallel	USB to Parallel	USB 2.0, Parallel	USB, Parallel
Input buffer (MB)	512 kb	2	2	1	8	4
Physical dimensions (LxWxH) cm	36.2x30.7x37.2	38.8x52.4x25.4	39.9x26.3x25.6	41.4x48.5x25.4	48.8x25.4x41.4	32.8x35.6x23.1
Paper feed tray	2	1	1	1	1	2
Paper capacity						
Tray	125	250	150	250	250	150
Manual	1	10	1	0	0	1
Toner price (Rs)	3,650	3,650	5,600	3,250	3,250	4,250
Weight (kg)	6	7.8	7.9	NA	8.3	6.5
Package contents						
Accessories	Power cord	Power cord, interface cables	Power cord, printer cord	Power cord, USB to parallel cord	Power cord	Power, USB, interface cable
Bundled software	Driver CD	Driver CD	Driver CD	Driver CD	2 Driver CD	Driver CD
Documentation						
Manual	✓	✓	✓	✗	✗	✓
Quick Start guide	✗	✓	✓	✗	✗	✓
Build quality (scale of 5)						
Paper-in tray	4	4	4	3.5	4	3.5
Paper-out tray	3.5	3.5	2.5	4	3.5	3.5
Toner flap	3.5	3.5	3.5	3	3.5	3
Performance						
Printing speed						
Image (seconds)	42	38.15	36.52	29.93	46.77	41.77
Word (seconds)	355	206	260.59	301.5	220.33	286
Combi document (seconds)	25.65	16.97	28.6	20.95	28.57	31.48
Printing quality						
Image (scale of 5)	3.5	3.5	3	2.5	3.5	3.5
Point size (scale of 5)	4	4	4	3	4	3.5
Combi document (scale of 5)	3	3.5	3	3	3	3.5
Bulk printing test						
Paper jam	✗	✗	✗	✓	✗	✗
Multiple sheet pickups	✓	✗	✗	✗	✗	✗
Warranty & Support						
Type of warranty	NA	NA	On site	NA	NA	RTB
Number of years	2	2	1	1	1	1
Number of authorised service centres	80	80	144	239	239	27
Number of cities covered	51	51	60	80	80	27
Overall Score						
Features (20%)	9.2	12.2	12	8.1	12.2	11
Performance (40%)	25.53	30.25	26.09	23.71	26.33	25.63
Warranty and support (20%)	9.00	9.00	8.00	11.00	11.00	5.00
Value for money (20%)	15.85	13.35	13.37	13.68	12.53	15.26
Overall product rating	59.58	64.80	59.46	56.49	62.06	56.89
Overall grade	B+	A	B+	B+	A-	B+
Vendor name	Canon India Ltd	Canon India Ltd	Epson India Pvt Ltd	Hewlett-Packard India Ltd	Hewlett-Packard India Ltd	Lexmark International (India) Pvt Ltd
Phone	011-680 6572	011-680 6572	080-5321266	011- 6826000	011- 6826000	044-824 2090
E-mail	brijesh@canon.co.in	brijesh@canon.co.in	achaiah@eid.epson.co.in	tarunjeet_sarao@hp.com	tarunjeet_sarao@hp.com	vmehta@lexmark.com
Price (in Rupees)	14,605	21,192	19,000	15,500	20,500	16,000

Disclaimer: All prices are subject to variation NA = Not available RTB = Return to base



Lexmark E322	Samsung ML-1210	Samsung ML-1450	Wipro Laser 1540
N	N	N	N
Ready, Toner low, Load paper, Paper jam, Error, Press button	Error, Paper, Data	Error, Manual, Paper, Data	Ready, Alarm, Data
1200	600	1200	1200
USB	USB, Parallel	USB, Parallel	USB, Parallel
8	8	12	2
38.1x36x22	32.9x35.2x22.9	36.2x40.9x29.5	36.0x37.0x23.5
2	2	2	1
150	150	550	250
1	1	0	1
5,223	2,650	6,200	3,800
9	6.2	12.4	9.2
Power cord, USB cord	Power cord	Power cord	Power cord, interface cables
Driver CD	Driver CD	Driver CD	Driver CD
✓	✗	✗	✓
✗	✓	✓	✓
3.5	3.5	3	2.5
4	4	4	3.5
3.5	4	3.5	3
148.41	26.73	45.61	140
182.72	280	248	202
300.67	47.85	33.14	29.58
3.5	3	3.5	3.5
4	4	3.5	3.5
3	3	3.5	3.5
✗	✗	✗	✗
✗	✗	✗	✗
RTB	On site	On site	Carry in
1	1	1	1
27	138	138	170
27	103	103	100
11.2	11.3	15.1	12.8
22.76	26.48	25.05	24.32
5.00	10.00	10.00	10.00
7.34	17.37	12.63	18.00
46.30	65.15	62.78	65.12
C+	A	A-	A
Lexmark International (India) Pvt Ltd	Samsung Electronics India Information & Telecommunication Ltd	Samsung Electronics India Information & Telecommunication Ltd	Wipro Peripherals
044-824 2090	NA	NA	022- 26397418
vmehta@lexmark.com	NA	NA	helpdesk.mumbai@wepindia.com
30,831	14,500	21,200	13,750

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7 Ways to Care for your Printer

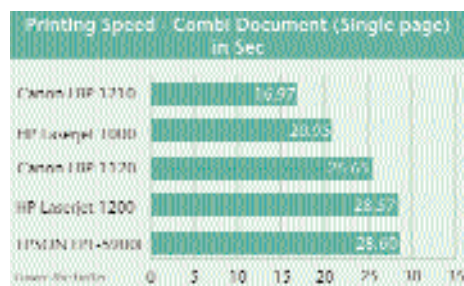
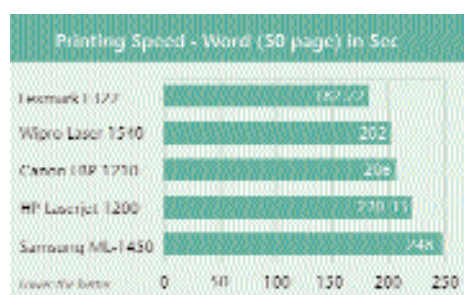


- Select the proper location to place your laser printer. A properly ventilated area is recommended. Select a place where temperature and humidity do not change frequently. Try to avoid areas with heavy dust buildup.
- Position the printer on a sturdy and level surface. Allow sufficient space around the printer for air flow.
- While cleaning your printer, always use a lightly dampened cloth to clean the outside of the printer. To clean the inside use a dry, lint-free cloth. This will ensure that no liquid enters the inner parts of the printer. Most manufacturers provide useful cleaning information on their manuals—always refer to them.
- Use papers manufactured specifically for your printer and also select the correct paper type for your print job.
- Keep your printer up-to-date by downloading the latest drivers and patches from the manufacturer's Web site. This helps because

most manufacturers provide driver updates for their units and these include patches that add fonts or rectify incompatibilities.

■ If debris is the primary cause of failures, toner is the primary cause of debris. All toner cartridges release a small amount of toner into the machine. This is why it's important to clean the machine when you change the cartridge. It is also important that the density control of the machine be properly set to prevent the machine from pulling too much toner into itself. We all like dark prints, but if your print settings are too dark, it could be detrimental to the life of the cartridge in the long run.

■ Don't pile documents or miscellaneous objects on top of your printer, as they could cause damage. Your printer could overheat and this could result in malfunctioning and even a reduction in the printer's life.



seconds to print the image file—ideal for you if your daily work revolves around printing a large number of image-heavy documents. Another worthy mention here is the HP Laserjet 1000, which logged an impressive time of 29.93 seconds.

The Lexmark E322 struggled in this test, posting a below-average score of 148.41

seconds (2 minutes, 28 seconds). The Wipro Laser 1540 was also sluggish, taking 140 seconds (2 minutes, 20 seconds) to complete the test.

Our next speed test involved printing a text document with approximately 30 per cent text coverage. The Lexmark E322

did well here, firing out 50 pages in just a little above 3 minutes (182.72 seconds). Following closely was the Wipro Laser 1540 which took approximately 20 seconds more to get the job done (202 seconds) and the Canon LBP 1210 (206 seconds). The slowest printer in this test was the Canon LBP 1120—it clocked 355 seconds (5 minutes, 55 seconds) to print the 50 pages. Look elsewhere if your daily work involves printing documents in huge numbers.

Our next test was the Combi document test. Here we recorded the time taken to print one page of a PDF document consisting of text and graphics. The Lexmark E322, the fastest in the previous test, was ironically the slowest performer here, taking 300.67 seconds (5 minutes) to print the document. The one printer that performed really well in this test was the Canon LBP 1210. This printer was able to print the Combi document in a speedy 16.97 seconds—if your print jobs generally involve large quantities of text-heavy documents, this printer fits the bill very well.



The Lexmark E322 is ideal for printing documents that contain text and images such as a Web page

Decision Maker

	Monochrome Imaging		General-purpose document printing	
Look for	A printer that features sharp printing quality for images, preferably one with a resolution of 600 dpi or more and a large print buffer		A printer that exhibits fast printing speed and has a large-capacity paper feed tray. A printer with a resolution of at least 600 dpi should be sufficient for these applications	
The models	Price-conscious	Performance	Price-conscious	Performance
	Wipro Laser 1540, Lexmark E210	Canon LBP 1210	Wipro Laser 1540, HP Laserjet 1000	HP Laserjet 1200, Samsung ML-1450
Price range	Rs 13,000 to Rs 16,000	Rs 21,000 to Rs 22,000	Rs 13,000 to Rs 15,500	Rs 20,500 to Rs 21,500

Quality: In this test we printed a TIFF image file at 600 dpi and checked the image for clarity in reproducing details in the photograph. The difference in image quality was not as stark as it would have been if they were colour printers. However, some printers still managed to stand out here with discernible variations in image quality.

In terms of overall image quality and clarity, most of the printers did quite well. Printers like the Canon LBP 1210 and the HP Laserjet 1200 performed well in reproducing clarity in monochrome images as well as text—there was no smudging or loss of contrast in the printed page. The only

Buying Smart



Warranty type: A carry-in warranty is definitely a big pain as far as bulky items such as laser printers are concerned. The warranty should be comprehensive and on-site.

Warranty period: The greater the warranty period, the better. It indicates that the manufacturer has greater faith in the product.

Suitability: Faster and higher quality printers are a lot costlier than slower ones. If you're in no hurry to take your printouts, or don't need excellent quality, set your sights a little lower. You'll end up saving big bucks that way.

After-sales service: With expensive items such as laser printers, it's a real bother to watch them crash or otherwise malfunction. Adding lousy customer service to that is like rubbing salt into a wound. Ask people who have already bought printers about their experiences with the customer-support staff. It might take some effort on your part, but is any day better than learning the hard way.

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one that performed under par in this test was the HP Laserjet 1000—the image produced by this printer was of very low quality and looked washed out even when using the best quality mode.

In our next test, that is, the point size test, we printed a document containing varying font sizes and checked for the quality. All the printers performed well in this test.

Bulk printing test: We performed this test to check the efficiency of the printers when printing in large numbers. We printed 50 pages of text and checked if there were any paper jams or multiple sheet printouts. Most of the printers passed this test without errors. These included the Canon LBP 1210, Epson EPL-5900L, HP Laserjet 1200, Lexmark E210 and E322, Samsung ML-1210 and Wipro Laser 1540. But there were some printers that didn't perform well in this test. These included the HP Laserjet 1000 and the Canon LBP 1120. We experienced paper jams with the HP printer and the Canon LBP 1120 gave trouble with its multiple sheet pickups even when the papers were shuffled to prevent them from sticking.

Warranty and support

Warranty and support becomes an important consideration when buying a peripheral device. Most manufacturers provide a one-year warranty and the authorised service centres are usually spread across the country.

The important thing is that the service centres should be spread across the country and not be concentrated in a single area. In this comparison,

Wipro had the maximum reach with 170 service centres across 100 cities. HP too has a wide reach with 239 service centres across 80 cities. Canon provides

the maximum warranty period at two years.



With an unmatched 239 service centres, HP printers are very customer friendly

What it all Leads to

Out of the 10 printers that we tested, some offered good features such as high resolution support, while others offered good documentation. Most printers aimed at improving the printing experience by offering good looks and sporting LED indicators. We also noted that nowadays manufacturers provide USB and parallel interfaces, which makes it convenient to connect the printer. The printers have also improved on build quality and ease of use. The printers have improved to a great extent in performance too.

The Canon LBP 1210 bagged the Best Performance Award—it exhibited superior print quality and at good speeds. In fact, it performed better in the speed tests than even some printers that supported higher resolutions. The pure text and image prints were also impressive, where it logged a time of 38.15 seconds and 206 seconds (3 minutes, 26 seconds), respectively. This printer was also quite amazing when it came to paper handling,



With an excellent printing speed, the Canon LBP 1210 is a definite buy if price is not a consideration

performing reliably in the bulk printing test.

This printer also offers good features and sports good solid looks. The front panel has a simple interface design, while the back panel features the usual USB and parallel

interface. One of the important criteria of any printer is the maximum paper capacity it can handle, and this printer is provided with a 250-sheet

paper tray and there is also provision for manual paper loading. To save on space, the paper-in tray can be detached if not in use. The printer package included a power cord, interface cables, manuals and the driver CD and also a quick start guide. The build quality was also very impressive—the trays don't feel tacky and sport a solid construction.

Our Best Value Award goes to the Wipro Laser 1540. This printer is for those who want a decently fast printer at an affordable price. The printer design is simple. There are visual indicators on the front for Ready, Alarm and Data Flow conditions. The printer supports a maximum resolution of 1200 dpi and sports the USB and parallel interfaces. The paper-in tray can hold a maximum of 250 sheets of paper and also supports a manual paper feed option. The printer gave some acceptable results in our print quality tests. When printing text, it was able to print even small-sized text quite accurately. All through our tests, there were no paper jams or multiple sheet pickups. All in all, this printer is a good buy for its price and this makes it our best value winner. ■



The 1200 dpi Wipro Laser 1540 offers a decent printing speed at an affordable price

1/2 page Ver. Ad

The Mouse Trap

Here are 10 entrants in the mice race. May the best mouse win!

The two-button scroll mouse is still the best seller today. Optical mice from vendors such as Mercury and The Best can be bought for anywhere between Rs 700 and Rs 1,000. While they are more affordable, mass acceptance is still another price cut away, especially when a normal ball mouse can be had for less than Rs 400. The professional user would, of course, like the reduced hassle and the greater accuracy afforded by the optical devices. We test 10 mice that cover both the ball and the optical variety, and come with and without cords.

Digit Test Process

We tested the mice on a system with a Pentium 4 2.2 GHz processor, an MSI MAX2BLR motherboard, 256 MB DDRRAM and a 40 GB Seagate Barracuda drive running Windows XP Professional. Four primary parameters were marked: features, ergonomics, build quality and value for money. Each parameter was allotted a 25 per cent weightage. The weightages allotted to each parameter was used to calculate the overall scores.

Features: The primary feature tested was the accuracy a mouse provided in gaming and image editing. the devices were rated on a scale of five. Next, we noted the extra programmable buttons that increase productivity. A mouse that supported the USB interface obviously scored more than one designed for the PS/2 port. Similarly, an optical mouse was rated higher than a ball mouse. As a final point of comparison, the length of the cable was also considered—the longer the tail, the more the mouse scored.

Ergonomics: A mouse was rated on a scale of five based on the degree of symmetry that it afforded to a user—both right and left handed. Next on the agenda was the grip, both on a surface and with the palm. A mouse that presented better traction and palm grip scored higher on a scale of five. To judge the ease of use, we rated each mouse on the placement of buttons and design aspects that allowed them to sit snugly within the palm.

Build quality: To test the build quality we dropped the mouse from a height of 6 feet. We then noticed any physical damage, following which the mouse was re-attached to the PC to ensure a working condition. Also tested was the quality and stability of the buttons that form the pointing device.

P R O D U C T S	
FRONTECH JIL-7001	
FRONTECH JU-830	
IBALL THE KING	
LOGITECH CORDLESS MOUSEMAN OPTICAL	
LOGITECH MOUSEMAN DUAL OPTICAL	
MERCURY OPTICAL SCROLL MOUSE	
MICROSOFT TRACKBALL OPTICAL	
MICROSOFT WIRELESS INTELLIMOUSE EXPLORER	
ODYSSEY WEB SCROLL MOUSE	
SAMSUNG SMP 2100WX	

Frontech JIL-7001

Features: PS/2 interface, no extra buttons Price: Rs 200
Contact: Jupiter Infosys India Ltd Phone: 022-22001211
E-mail: frontech@bom5.vsnl.net.in Web site: www.frontech.com

The JIL-7001 from Frontech combines a metallic dark blue with silver with stunning effects. This makes the device stand out from the crowd of the regular two-button scroll mice.



This Plug and Play mouse does not require any drivers to get it up and running. A PS/2 connectivity, however, takes away from hot plugging the device. Gamers used to the two-button mouse will find this mouse suitable to their need as there is no design difference.

This mouse is available for just Rs 200, hence making it the cheapest of the lot and given its performance in different applications, this is a good buy.

Frontech JIL-7001		B+
Features	▶▶▶▶▶	
Build quality	▶▶▶▶▶	
Ergonomics	▶▶▶▶▶	
Value for money	▶▶▶▶▶	
OVERALL	▶▶▶▶▶	

Frontech JU-830

Features: USB interface, two extra buttons Price: Rs 350
Contact: Jupiter Infosys India Ltd Phone: 022-22001211
E-mail: frontech@bom5.vsnl.net.in Web site: www.frontech.com

The JU-830 is a two-button scroll mouse, with two extra buttons on the sides. Upon installation of the supplied drives, these buttons can be programmed to certain actions that include simulating mouse actions such as a double-click, zooming in on Web pages, or mapping keyboard keys like [F1], [Page Up], etc. The extra buttons take a little getting used to, especially if you've assigned them functions. Often, these buttons get pressed while moving the mouse around. The device uses a PS/2 interface to connect to the computer, and has a resolution of 400 dpi, both of which are very standard features. The mouse on the whole is very ordinary, and at Rs 350, it does not pretend otherwise.

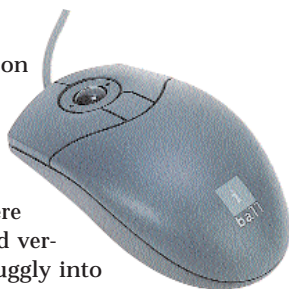


Frontech JU-830		A-
Features	▶▶▶▶▶	
Build quality	▶▶▶▶▶	
Ergonomics	▶▶▶▶▶	
Value for money	▶▶▶▶▶	
OVERALL	▶▶▶▶▶	

iball The King

Features: Optical mouse, PS/2 interface, no extra buttons
Price: Rs 950 Contact: The Best Phone: 022-26935135
E-mail: lata@bestitworld.com

The iball, is a functional combination of a trackball and a traditional three-button scroll mouse. The trackball is extremely convenient for scrolling, even for those used to the ubiquitous three-button mouse. There are four directions for horizontal and vertical scrolling and the mouse fits snugly into your palm. The optical functionality increases its life-time by eliminating any internal moving parts. Clicking is very convenient and the cursor movement at default setting was smooth. The cable wire is short enough to prevent unnecessary loops, while long enough to reach the cabinet placed below the table. With a robust design and the advantages of the centre button (there are some 30 programmable options), the iball is an excellent buy for the multi-tasking professional who can use this feature to cut down on the time taken to click the glut of menus that plague Windows. At Rs 950 it also offers a good upgrade path for those looking to move on from the traditional scroll mouse.



iball The King		A-	
Features	▶▶▶▶▶		
Build quality	▶▶▶▶▶		
Ergonomics	▶▶▶▶▶		
Value for money	▶▶▶▶▶		
OVERALL	▶▶▶▶▶		

Logitech MouseMan Dual Optical

Features : Dual-optical cordless mouse, USB interface, one extra button Price: Rs 4,000 Contact: Rashi Peripherals
Phone: 022-28260258 E-mail: ho@rptechindia.com
Web site: www.logitech.com

The Dual Optical Mouse from Logitech uses optical sensing technology for defining the pointer movement on the screen. It features a top-notch finish with a two-tone colour combination that gives it an elegant look. The design of the device is, however, biased in favour of a right-handed user. The device fits snugly within the palm and is comfortable to use, thanks to its shape. A rubberised side grip near the thumb provides excellent lateral hold to grasp the mouse. The buttons are well laid and comfortable to use, with a well-balanced scroll wheel that provides a good tactile feel. A fourth button placed near the thumb is a good programmable stand-in. What sets the device apart from others is the use of two 800-dpi optical sensors for better accuracy and handling. The mouse showed good directional stability and accurate pin point precision in applications such as Photo-shop and gaming.



Logitech Dual Optical		B	
Features	▶▶▶▶▶		
Build quality	▶▶▶▶▶		
Ergonomics	▶▶▶▶▶		
Value for money	▶▶▶▶▶		
OVERALL	▶▶▶▶▶		

Logitech Cordless MouseMan Optical

Features: Optical cordless mouse, USB interface, no extra buttons, two AAA batteries Price: Rs 4,990 Contact: Rashi Peripherals
Phone: 022-28260258 E-mail: ho@rptechindia.com
Web site: www.logitech.com

Those looking for the trinity of designer looks, the precision of an optical device and the freedom afforded by the absence of cords should look no further than the Logitech Cordless MouseMan Optical. The mouse fits the palm as if it were a part of it. A tri-colour body and a smooth finished contour imparts a cool look to the device. The only problem with this mouse is the right and left-click button: these buttons are small compared to normal mice and are not easily accessible. The additional key provided can be customised for any function using the Logitech MouseWare utility provided on the CD. The mouse is available for Rs 4,990, keeping it out of the reach of most buyers. If you are a professional and are looking for accuracy in applications such as Photoshop and 3dsmax, this mouse is sure to impress you.

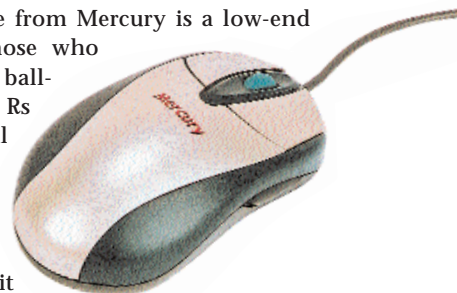


MouseMan Optical		B+	
Features	▶▶▶▶▶		
Build quality	▶▶▶▶▶		
Ergonomics	▶▶▶▶▶		
Value for money	▶▶▶▶▶		
OVERALL	▶▶▶▶▶		

Mercury Optical Scroll Mouse

Features: Optical mouse, USB interface, two extra buttons
Price: Rs 550 Contact: Kobian India Ltd Phone: 080-5566626
E-mail: rohit@kobian.com Web site: www.kobian.com

The Optical Scroll Mouse from Mercury is a low-end optical solution for those who wish to evolve from the ball-mouse. With a price tag of Rs 550, this offering puts optical solutions well within the reach of almost anyone. The mouse has a striking twin grey and dark blue colour combination making it stand out against the beige of your desktop PC. Another big advantage of the Optical Scroll is the USB connection which makes it easy to plug in the pointing device and get it up and running. Since there are older systems around which do not have the requisite port, a USB to PS/2 converter would have helped. As far as design is concerned, this device is pretty much your plain vanilla two-button scroll mouse, the only addition being that the scroll button glows red when used. If you are looking for an inexpensive optical mouse then nothing can beat the Mercury Optical Scroll Mouse.



Mercury Optical Scroll		A-	
Features	▶▶▶▶▶		
Build quality	▶▶▶▶▶		
Ergonomics	▶▶▶▶▶		
Value for money	▶▶▶▶▶		
OVERALL	▶▶▶▶▶		

Microsoft TrackBall Optical

Features: Optical track ball, USB interface, two extra buttons
Price: Rs 1,690 Contact: Microsoft Corporation India Pvt Ltd
Phone: 011-26292640 E-mail: connect@microsoft.com
Web site: www.microsoft.com

Trackball devices have always generated a negative response from first time users, since they require patience and some getting used to. The trackball device is designed for comfort and to reduce the possibility of acquiring Repetitive Strain Injury (RSI). Unlike finger-driven trackballs, which require the thumb to click and hold the pointer device's buttons, the Optical's design allows you to use your forefinger and the middle finger to operate the buttons and the scroll-wheel, thus mimicking the way we use a mouse. Although the device looks daunting, it does not take up too much desk space.

The installation is hassle-free and the software included, Intellimouse 4.1, lets you configure the extra buttons. Its Optical nature offers a highly accurate, slip-free method of pointing, even when the ball is rolled rapidly. It is a USB device but comes with a PS2 adapter. Exclusively designed for right-handers, the Optical leaves lefties completely at a loss.



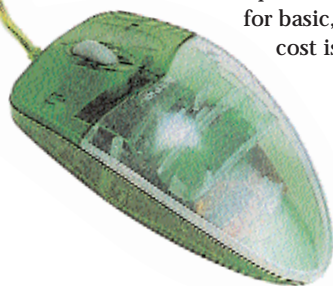
Trackball Optical B-	
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Value for money	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Odyssey Web Scroll Mouse

Features: PS/2 interface, no extra buttons Price: Rs 293
Contact: Compuage Infocom Ltd Phone: 022-23842200
E-mail: info@compuageindia.com
Web site: www.compuageindia.com

The first thing that strikes you about the Odyssey Web Scroll mouse is its transparent goblin green body, complete with a matching transparent green cable. The device is a standard three-button scroll mouse, designed for both right and left-handed users. Featuring a PS/2 interface, the Web Scroller is a little too large for comfort for those with small hands. Additionally, the pointed tip of the device digs into the bottom of the palm, making it uncomfortable during long hours. The buttons, though large, seem tacky and do not have a comfortably snug feel about them. The scroll wheel also fails to deliver accuracy and tends to scroll a little more or less than is desired. Apart from this, the device is smooth and offers decent precision. The package includes IWare Plus for Windows 95/98/NT on a floppy disk.

With a price tag of Rs 200, the device is suitable for basic, non-frequent home usage where cost is a consideration.



Odyssey Web Scroll B	
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Value for money	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Microsoft Wireless IntelliMouse Explorer

Features: Optical mouse, USB interface, two extra buttons, two AA batteries Price: Rs 3,380 Contact: Microsoft Corporation India Pvt Ltd Phone: 011-26292640 E-mail: connect@microsoft.com
Web site: www.microsoft.com

The Intellimouse fits perfectly within the palm, making long working hours easy on the hand. The black and metallic grey combination makes it an attractive piece. The buttons are easy to click with the two extra buttons just under the thumb for faster access. The mouse is good for both gaming as well as regular office sessions. The accuracy afforded by the optics ease both, railing opponents in *Quake III Arena* and making pixel-precise selections in Adobe Photoshop. The scroll button, which doubles as the middle button, is very smooth and noiseless. The pack came with two AA batteries, a receiver, a software CD and a manual. The mouse gets detected without a hassle or a need to provide drivers. This optical mouse is a worthy upgrade from the previous corded optical or the cordless infrared mouse.



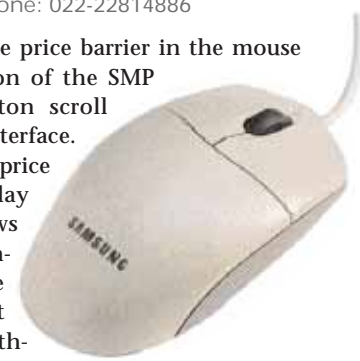
IntelliMouse Explorer A-	
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Value for money	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Samsung SMP2100WX

Features: PS/2 interface, no extra buttons Price: Rs 260
Contact: Samsung Asia Pte Ltd Phone: 022-22814886

Samsung is trying to break the price barrier in the mouse market with the introduction of the SMP 2100WX, a standard two-button scroll mouse, available for the PS/2 interface. It performs just as expected for a price of Rs 260. Being a Plug and Play device, all versions of Windows can immediately detect and configure the mouse as well as the associated scroll wheel. Since it has only two buttons, there's nothing programmable here. Everything sets up instantly.

As far as the feel of the SMP2100WX is concerned, the wheel is slightly unbalanced and tends to jerk up and down. Discouragingly, the rest of the mouse feels just as unstable and at high speeds, it tends to move towards the left and the bottom. This unbalance makes it difficult to use the SMP2100WX for fast-paced games such as *Quake III Arena*. If you intend to use it for everyday office applications and play games once in a while, then this mouse just about suits your needs—especially if you're looking to shell out the minimum possible cash.



Samsung SMP2100WX B+	
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Value for money	▶▶▶▶▶
OVERALL	▶▶▶▶▶

All the Right Keys

Keyboards are the most used components of your PC. We tested six of them to find which one deserves your touch

The days of the 101-key keyboard are long gone, with newer multimedia keyboards sporting as many as 22 hotkeys apart from aesthetic and ergonomic designs. The price of these keyboards is now less than Rs 600, whereas a regular keyboard can be purchased for as less as Rs 300. We tested six keyboards from Microsoft, Odyssey, Logitech and Samsung.

Digit Test Process

We tested the keyboard on a system with a Pentium 4 2.2 GHz processor, an MSI MAX2BLR motherboard, 256 MB DDRAM and a 40 GB Seagate Barracuda drive. The OS used was Windows XP Professional. The keyboards were tested on four primary parameters: Features, Ergonomics, Build quality and Value for money. Each parameter was allotted a 25 per cent weightage. The weightages allotted to each parameter was used to calculate the overall scores.

Features: The interface of the keyboard was the first criterion of testing. A USB keyboard scored higher than a PS/2 one. Next up was the number of hotkeys on the keyboard. The greater this number, the higher it scored. Finally, some keyboards come with integrated trackballs and other mouse controls—such devices scored higher over those that did not feature these.

Ergonomics: Comfort is paramount when judging a keyboard. The ergonomics that a keyboard offered was evaluated on the basis of several factors—the comfort it provided while typing, the layout of the keys on the device, the tactile feedback while typing and the presence or absence of a palm rest were the factors considered.

Build quality: A keyboard should be built to last, since the device is in constant touch with its user and use and abuse are part of its job description. Keyboards were thrown against each other on the basis of sturdiness and the stability of the buttons and of the unit as a whole.

P R O D U C T S	
LOGITECH NEWTOUCH MULTIMEDIA KEYBOARD	
MICROSOFT MULTIMEDIA KEYBOARD	
ODYSSEY OD2001 IR	
ODYSSEY OD2001 M1	
SAMSUNG MULTIMEDIA KEYBOARD SEM-M2A	
SAMSUNG PC KEYBOARD	

Logitech NewTouch Multimedia Keyboard

Features: 12 hotkeys, PS/2 interface, package includes a palm rest
Price: Rs 875 Contact: Rashi Peripherals Phone: 022-28260258
E-mail: ho@rptechindia.com Web site: www.logitech.com

The New iTouch Multimedia Keyboard from Logitech is easy on the eyes and offers a great typing experience. It has a total of 12 hotkeys that allow faster Web surfing and greater efficiency when working with applications. The keys are soft on the fingers and a delight to work with, complete with silent keystrokes and an excellent build quality. Accompanying the keyboard is a driver CD to configure the shortcut keys and a Quick Start Guide. The keyboard is priced at Rs 875, which brings it under the budget of most users and also makes it a very good option for both office and home users.



Logitech Newtouch		B+
Features	▶ ▶ ▶ ▶ ▶	
Build quality	▶ ▶ ▶ ▶ ▶	
Ergonomics	▶ ▶ ▶ ▶ ▶	
Value for money	▶ ▶ ▶ ▶ ▶	
OVERALL	▶ ▶ ▶ ▶ ▶	

Microsoft Multimedia Keyboard

Features: 16 hotkeys, PS/2 interface, package includes a palm rest
Price: Rs 1,606 Contact: Microsoft Corporation India Pvt Ltd
Phone: 011-26292640 E-mail: connect@microsoft.com
Web site: www.microsoft.com

Testing Microsoft's MultiMedia keyboard was a sheer delight. It has a very intelligent placement of the keys and features a new design with rounded contours and a two-tone finish with a blue body and white keys. The multimedia keys are located at the top, along with keys for accessing your e-mail, an instant messenger, the Media Player, the My Documents folder, etc. Apart from these, an F-lock key allows the user alternate uses for the function keys such as open a new Word document, send mail, etc. The keyboard pegs are well designed and sturdy enough to take the load of your palm. The provided software works seamlessly and hassle-free. With a price tag of Rs 1,606, this keyboard from Microsoft is one of the best around.



Microsoft Multimedia		B+
Features	▶ ▶ ▶ ▶ ▶	
Build quality	▶ ▶ ▶ ▶ ▶	
Ergonomics	▶ ▶ ▶ ▶ ▶	
Value for money	▶ ▶ ▶ ▶ ▶	
OVERALL	▶ ▶ ▶ ▶ ▶	

Odyssey OD2001 IR

Features: Infra-red communication, range of 2 meters, 15 hotkeys, on-board track pad, PS/2 interface, package includes a palm rest
Price: Rs 2,340 Contact: Compuage Infocom Ltd
Phone: 022-23842200 E-mail: info@compuageindia.com
Web site: www.compuageindia.com

The Odyssey OD2001 IR is a sleek, sophisticated keyboard with a black body and keys set in a tasteful dark grey. Mouse control is emulated via a track pad, provided at the upper right corner, with buttons simulating the left and right buttons. This infrared unit works at a distance of approximately 5 metres from the receiver (although the manual claims a safe distance of 2 metres). With a layout that emulates a laptop's keyboard (its width is less compared to normal keyboards), the Odyssey is a compact package that fits snugly on the lap of the typist. The keyboard weighs less than a kilo, while the base unit weighs less than 250 grams, making it quite easy to lug around. There are 15 special function keys—four for Internet functions, three for volume control, five for audio control, one key for power, another for standby and the last one for the alarm. You just need to plug the PS/2 connectors for the mouse and keyboard in the sockets and its ready. No driver installation is required even for the 15 special keys. However, the price tag of Rs 2,340 takes some thinking.



Odyssey OD2001 IR B+	
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Value for money	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Samsung Multimedia Keyboard SEM-M2A

Features: 20 hotkeys, PS/2 interface, palm rest not bundled
Price: Rs 300 Contact: Samsung Asia Pte Ltd
Phone: 022-22814886

Here is a keyboard that offers excellent build quality but is found lacking in the looks department. With around 20 additional programmable keys, the device offers both flexibility and comfort, since the keys are soft, silent and very easy on the fingers. The keyboard is quite heavy, making it more stable on the desk. A small form factor ensures that it occupies very little desktop space. It interfaces with the PC via the PS/2 port and a cable that is of sufficient length for most desk spaces. On the whole, this product from Samsung provides good value for money.



Samsung SEM-M2A B	
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Value for money	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Odyssey OD2001 M1

Features: PS/2 interface, package includes a palm rest Price: Rs 585
Contact: Compuage Infocom Ltd
Phone: 022-23842200 E-mail: info@compuageindia.com
Web site: www.compuageindia.com

The Odyssey OD 2001 M1 is an ideal solution for those looking to buy a keyboard for multimedia applications, without burning a hole in the pocket. This keyboard is easy on the eye with a white and grey colour combination. The multimedia keys are neatly arranged on top and it has all the usual features, viz, Play/Pause, Volume-Up, Volume-Down and Mute for music lovers; and shortcut keys for Web browser, such as Search and Favorites and Power, Sleep & Wake.



The Odyssey OD2001 M1 is heavier than other keyboards, giving it desk stability, while the palm rest bundled affords good ergonomics. Installation is simple—plug the keyboard into a PS/2 connector and you are all set—no driver hassles, no special software needed for the multimedia keys. With a price tag of Rs 585, it makes a decent purchase.

Odyssey OD2001 M1 B	
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Value for money	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Samsung PC Keyboard

Features: No hotkeys, PS/2 interface, palm rest not bundled
Price: Rs 300 Contact: Samsung Asia Pte Ltd
Phone: 022-22814886

The first thing that strikes you about the SEM-DT35N is its sleek black colour. The feel of the keyboard is very easy on the fingers and it doesn't offer any multimedia buttons, bringing its cost down to an affordable Rs 300. Borrowing a leaf off the weird book, the keyboard provides support for the Korean Hangul script. While this might seem like a good thing for the miniscule Indian populace that interacts with that language, to the rest of us the feature only serves to add a lot of visual clutter. What's worse is the decision to obscure the all important backslash key [\]: it is still there, but marking its position is the normal 'pipe' symbol and a weird looking symbol that remotely resembles a 'W'. A new user would be quite dismayed to find the all-important backslash key missing.

But its reasonable price makes it easy to overlook this fault—it's extremely difficult to find economical keyboards that look good and perform well. All said and done, Samsung sure has a pretty decent product on its hands.



Samsung PC Keyboard B+	
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Value for money	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Two to Tango

The right mouse and keyboard work together to take the stress off your fingers. We tested four lethal combinations to help you make the right choice

A keyboard and mouse combination is meant as the one-stop solution for the discerning and wallet heavy user segment. These bundles are ergonomic, good to look at and fall within the price bracket of Rs 3,500 to Rs 6,500. Some of these boards aim to offer a complete solution—a wireless, optical keyboard and mouse combination. We tested four such combination packages.

Digit Test Process





The keyboard and mouse combos were tested on four primary parameters: Features, Ergonomics, Build quality and Value for money. Each parameter was allotted a 25 per cent weightage. The weightage allotted to each parameter was used to calculate the overall scores.

Features: The interface of the keyboard, the number of hotkeys, whether it was wireless or corded, the presence of integrated scrolling devices or trackballs were all taken into consideration. The accuracy of the mouse under Photoshop and gaming was the primary feature consideration. An optical mouse obviously scored higher; similarly cordless and USB pairings were put on a pedestal.

Ergonomics: Comfort was given equal importance in both the mouse and the keyboard. While the keyboard also rated on the layout of the keys, the tactile feedback and a palm rest, the mouse was primarily awarded for being symmetrical, for providing a

good grip to the palm and a good traction to the surface on which it was placed.

Build Quality: Keyboards were tested on the basis of sturdiness and the stability of the buttons and of the unit as a whole, whereas the mice were dropped from a height of 6 feet and checked for physical damage. The quality and stability of buttons that come along with such a pointing device was also tested against each other on the basis of sturdiness and the stability of the buttons and of the unit as a whole.

P R O D U C T S	
LOGITECH CORDLESS FREEDOM OPTICAL	
MERCURY CORDLESS KEYBOARD AND MOUSE KOB 30210	
MICROSOFT WIRELESS DESKTOP	
TYPHOON ITEK RF@MOUSE AND KEYBOARD	

Logitech Cordless Freedom Optical

Features: 20 hotkeys, USB interface, package includes a palm rest and a cordless optical mouse Price: Rs 6,950 Contact: Rashi Peripherals Phone: 022-2826 0258 E-mail: ho@rptechindia.com Web site: www.logitech.com

Mercury Cordless Keyboard & Mouse KOB 30210


Features: 19 hotkeys, PS/2 interface, package includes a palm rest and a cordless scroll mouse Price: Rs 2,000 Contact: Kobian India Ltd Phone: 080-5566626 E-mail: rohit@kobian.com Web site: www.kobian.com

The Logitech Cordless Freedom is a wireless set that eliminates line-of-sight restrictions by working in the radio frequency band. The set packs in a cordless keyboard, a cordless optical mouse and a suitable receiver. The keyboard has an excellent layout and works perfectly with all applications. Although it remains responsive at a distance of 20 feet, the mouse (Logitech Cordless MouseMan Optical) misses signals and is generally not as responsive. The set is both good looking and feature packed—the keyboard comes with 20 hotkeys for Internet and multimedia applications and a handy on-board scroll button. The bundled mouse is a bit heavy but works

ly. Moreover, the Logitech MouseWare Control Centre lets the user define shortcut keys for both the extra button and the centre button.

Logitech Freedom						A-
Features	▶	▶	▶	▶	▶	
Build quality	▶	▶	▶	▶	▶	
Ergonomics	▶	▶	▶	▶	▶	
Value for money	▶	▶	▶	▶	▶	
OVERALL	▶	▶	▶	▶	▶	

The KOB 30210 is a cordless bundle of mouse and keyboard that operates on radio frequency. The design of both the constituents has been kept very simple. The keys are placed in the standard layout while the shortcut keys are arranged in one line, giving the board a very plain look. Shockingly, the keyboard does not have on-board LEDs for [Caps Lock], [Num lock] and [Scroll Lock]—an unfortunate omission. The keyboard offers decent build quality and the keys are quite enough while in use. It requires three AA batteries to work, which adds to the weight of the keyboard and increases its running cost. The mouse bundled is a cordless two-button scroll mouse which works fine with most applications and from a distance of over 6 feet.



Mercury KOB 30210	
Features	▶▶
Build quality	▶▶▶
Ergonomics	▶▶▶
Value for money	▶▶▶
OVERALL	▶▶▶▶

Mercury KOB 30210		B+
Features	★★★★★	
Build quality	★★★★★	
Ergonomics	★★★★★	
Value for money	★★★★★	
OVERALL	★★★★★	

Microsoft Wireless Desktop

Features: 10 hotkeys, PS/2 interface, package includes a palm rest and a cordless optical mouse Price: Rs 3,634 Contact: Microsoft Corporation India Pvt Ltd Phone: 011-26292640 E-mail: connect@microsoft.com Web site: www.microsoft.com

This simple looking wireless multimedia keyboard and mouse gives a complete desktop solution. The keyboard has a fairly easy-to-use layout with a detachable palm rest and 10 one-touch hot keys that allow you to browse the Internet, open your e-mail client and put your computer into a power saving mode. The wireless mouse provided has programmable buttons which can be customised. Its unique design suits the right as well as left-handed user. A wireless receiver ensures your desk remains clutter free and its dual channel receiver ensures interference-free computing, even if the receiver is out of sight. There will be no difference in the performance of the devices even if they are 6 feet away from the receiver.



MS Wireless Desktop					A
Features	▶	▶	▶	▶	▶
Build quality	▶	▶	▶	▶	▶
Ergonomics	▶	▶	▶	▶	▶
Value for money	▶	▶	▶	▶	▶
OVERALL	▶	▶	▶	▶	▶

Typhoon iTek RF@Mouse and Keyboard

Features: 16 hotkeys, PS/2 interface, package includes a palm rest Price: Rs 1,950 Contact: Hitech Computers Phone: 022-24927323 E-mail: bom@hitechit.com Web site: www.hitechit.com

The Typhoon iTek RF@mouse and keyboard combination works on the radio frequency band and is therefore operable from a distance without needing a line of site. The complete pack comes with a multimedia keyboard, a cordless mouse, a receiver and a palm rest for the keyboard. The layout of the board is decent with 16 hotkeys spread across the top of the keyboard. The multimedia keys find themselves grouped on the left side, while the Internet keys are located on the right. The keys are not too easy on the fingers—hard strokes are needed to do the typing and as such the unit is not ideal for long sessions. The two-button bundled mouse works well from a distance of 15 to 18 feet, given that there is nothing blocking the device from the receiver; otherwise the pointer moves in a jerky fashion on the screen. In all, the Typhoon is a good bundle at an affordable price.



Typhoon Itek RF					B+
Features	▶	▶	▶	▶	▶
Build quality	▶	▶	▶	▶	▶
Ergonomics	▶	▶	▶	▶	▶
Value for money	▶	▶	▶	▶	▶
OVERALL	▶	▶	▶	▶	▶

1/2 page H AD

Bazaar



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

Pentium 4 3.06 GHz

Intel's newest, baddest and fastest desktop processor

Intel's Pentium 4 3.06 GHz processor finally makes HyperThreading a reality for the desktop PC. With this technology, your processor will appear like two separate CPUs to your OS. The current version of HyperThreading technology allows a maximum of two threads to be dispatched to the CPU. Everything else has still stayed the same. So really how good is the processor?



rather than a synthetic one and is designed to show the improvements that instruction sets used in various processors (MMX/Enhanced, 3DNow! /Enhanced, and SSE (2)) bring to such an algorithm. We also ran the Memory benchmark, which measures sustained memory bandwidth. Here the P4 3.06 GHz easily outperformed the 2.8 GHz-based processor even with HyperThreading turned off.

In the CPU multimedia subtest too, the HyperThreading-enabled CPU posted a higher score in the FPU SSE region though the integer scores don't offer much to talk about.

To test the gaming performance of the processor, we ran a time demo on the retail version of *Quake III Arena* patched with version 1.30. The test was run in three different settings: normal, high and max (1024x786x32x32).

In the normal mode there was no difference in the scores with HyperThreading switched on and off, but the difference was noticeable in the high and max quality modes.

Our second gaming test involved running *Comanche 4* in three different settings, normal (640x480x16), high (800x600x16) and maximum (1024x786x32). Here too there

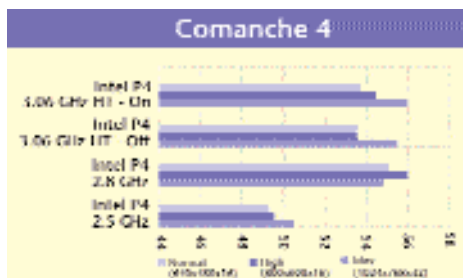
wasn't much difference in the frame rates with HyperThreading turned on and off.

Another area where a high amount of CPU power is required is video encoding. To measure the performance of a processor during video encoding, we encoded a standard MPEG-2 format video sequence using VirtualDub v1.4. The DivX codec used was v4.02 and the setting for audio and video processing in VirtualDub was turned to full processing mode. The video compression bit rate was set at 900 Kbps. Here the less time it

ple of benchmarks simultaneously. We ran the Povray benchmark, which is severely CPU intensive, while simultaneously running *Comanche 4* in the normal mode. We ran this test first with HyperThreading turned off and then with HyperThreading turned on just to see if it makes a difference—we achieved an average 26.57 fps with the HyperThreading disabled and a boost of approximately 11 fps with it enabled.

All in all, Intel's latest desktop processor truly impresses with its performance and the

HyperThreading feature makes it achieve higher performance scores under stress. HyperThreading in its future iterations could very well overcome its little drawbacks



takes to encode the file, the better it is. We recorded our lowest ever score—the CPU took a mere 51 seconds to encode the video file. This makes the P4 3.06 a great option for those who work with video encoding applications to a large extent.

Just to put the CPU under a bit more stress, we ran a cou-

ple of benchmarks simultaneously. We ran the Povray benchmark, which is severely CPU intensive, while simultaneously running *Comanche 4* in the normal mode. We ran this test first with HyperThreading turned off and then with HyperThreading turned on just to see if it makes a difference—we achieved an average 26.57 fps with the HyperThreading disabled and a boost of approximately 11 fps with it enabled.

SPECIFICATIONS

0.13 micron fabrication, 478 pins, 533 MHz FSB bus, HyperThreading

To answer this question, we tested the Pentium 4 3.06 GHz on a machine based on an Intel D845PEBT2 motherboard with 256 MB of DDR RAM, an ATi Radeon 9700 Pro graphics card and a Seagate Barracuda 7,200-rpm ATA IV 40 GB hard disk drive, running Windows XP Professional. The hard drive was clean formatted before installing the OS and all the necessary driver updates and patches were applied before running any benchmark.

Our first tests included synthetic benchmarks. Here we ran SiSoft Sandra Professional 2003 and noted the scores in different areas. In the CPU benchmark that indicates the theoretical performance potential of the CPU, the Pentium 4 3.06 GHz scored 9059 CPU Drystone marks and 5567 Whetstone marks.

The CPU multimedia subtest is a real-life benchmark

Price: Rs 41,500
Contact: Nebula Technologies Pvt Ltd
Phone: 022-22670567
Fax: 022-26331074
E-mail: pratik@nebulatech.com
Web site: www.intel.com

Pentium 4 3.06 GHz		B+
Performance	▶▶▶▶▶	
Build quality	▶▶▶▶▶	
Value for money	▶▶▶▶▶	
Features	▶▶▶▶▶	
OVERALL	▶▶▶▶▶	

Fuji S602 Zoom Digital Camera

Resolve to click

The S602 looks good with a dual-tone colour finish and rounded contours. The ergonomics of the camera is spot on with perfect weight balance. It is powered by four AA batteries that are placed such that they balance out the weight of the lens.

The controls have been placed thoughtfully—the mode selection dial surrounds the shutter release button and the zoom controls are slightly angled to make it comfortable to be operated by the thumb. The exposure mode selector has a rubberised feel and provides good grip, and the command wheel is placed within thumb reach and offers a good tactile feel.

It has a 3.1 megapixel CCD count and is provided with a zoom lens with 6x zoom. The camera features the third generation Super CCD technology, which helps in interpolating the image to 6 million pixels. You can also record a VGA video at 30 fps with the resolution set to 640x480. Its 1.8-inch TFT LCD monitor is easy to use indoors, but as with all LCD monitors, it's difficult to use in bright sunlight, however you can use the Electronic View Finder, which has a tiny 0.44-inch LCD, instead.

This camera includes a 16 MB Smart Flash card and is compatible with both Compact Flash type I/II slot and IBM's micro-drive. It can be hooked on to a computer using the USB port, or the

Video Out jack. It also has a DC-In jack and a tripod stand mount. There are several automatic modes to make it easy for the aim-and-shoot users. A very interesting feature is the 'last five' continuous shooting mode, where the camera takes up to 25 frames but records only the last five frames—particularly useful when shooting at a sports event where you can predict the moment and start shooting just before the finish so you don't miss the action.

In our test the camera captured fairly good details, producing good tonal balance, except that the red colour had a slight orange tinge when seen using the Histogram feature of PhotoShop. Also, the edges of the picture showed a blue halo. In our resolution test, the camera reproduced a high-quality image at a native resolution of 2832x2128.

All in all, this high-end digital camera has good features. Its 6x optical zoom and support for attaching lenses such as telephoto and wide fish eye lens, make it a good choice for professionals. The only real hindrance is the price—at Rs 66,000 it is too expensive for a casual shutter-bug.

SPECIFICATIONS

3.1 megapixel zoom lens, 6x optical zoom, 1.8-inch LCD monitor, 16 MB Smart Flash card, four AA batteries

Fuji S602		B+
Performance	▶▶▶▶▶	
Build quality	▶▶▶▶▶	
Value for money	▶▶▶▶▶	
Features	▶▶▶▶▶	
OVERALL	▶▶▶▶▶	

Price: Rs 66,000
Contact: Jindal Photo films
Phone: 022-28504949
Fax: 022-28504044
E-mail: k_mohan/jpl@jindals.com
Web site: www.fuji.com

HP 5550 Deskjet Printer

Hey good lookin'

This silver coloured printer sports a futuristic design with matt grey paper flaps and a translucent black hood that covers the cartridge bay. This hood opens just like the hatch of a car and then slides along the body surface. However, the printer has a rather large foot print.

HP has revised the printer design to include support for new types of standard cartridges and photo-cartridge. The cartridge installation is simple and requires no force for getting them in place. The cartridges use a smaller drop size and the printer comes with PhotoRet IV which means it provides six basic colours instead of four. Also, PhotoRet IV has 1.2 million colours as opposed to the 3,500 in PhotoRet III mode.

Depending on the cartridge, the printer works in different modes. With standard cartridges the printer shifts to PhotoRet III (for text printing); with Photo Cartridge the printer works in PhotoRet IV (for printing images). The printer automatically adjusts the print resolution depending on the paper quality. To print at the maximum rated resolution (4800x1200) the paper type has to be selected manually.

The printer has support for A4 sheets and up to 100 sheets can be loaded in one go. The paper output flap can handle 50 sheets, however, the locking mechanism is not

strong enough to hold this weight. The printer has an 8 MB buffer and has an IEEE 1284-B parallel port and a USB port for connecting to a PC.

In our tests, it printed text in black and white mode at a relatively good speed of 9 PPM. In the fast draft mode, it was exceptionally fast, scoring 13 PPM compared to the normal mode of operation. In the combination document test, it printed the test file under a minute in the greyscale mode, which is pretty fast. It surprised us by taking the same amount of time to print this file in colour mode! It took approximately 300 seconds (5 minutes) to print the test image, which is fast enough for a printer in the mid-range category. It took around 180 seconds (3 minutes) to print the image in greyscale.

The print quality was crisp and clear, with no smudging or jarring. The image quality test showed slight saturation in the colour reproduction. The HP 5550 delivers good printing speed, especially for text and combination documents. Though the image printing speed is a bit slow, it makes up for this with good image quality—a good choice if you want a printer for daily office printing work and to occasionally print photographs.

SPECIFICATIONS

4800x1200 dpi printing, one USB, one parallel port, 8 MB buffer, 100 sheet input tray

HP 5550 Deskjet		B+
Performance	▶▶▶▶▶	
Build Quality	▶▶▶▶▶	
Value for money	▶▶▶▶▶	
Features	▶▶▶▶▶	
OVERALL	▶▶▶▶▶	

Price: Rs 9,990
Contact: Hewlett-Packard India Ltd
Phone: 011-2682 6000
Fax: 011-2682 6053
E-mail: seema_dawar@hp.com
Web site: www.hpindia.com

Kodak CX4200 Digital Camera

Click this

The Kodak CX4200 is a 2 megapixel camera with a maximum resolution of 1632x1232. Its rounded contours fit nicely into the palm and is light enough to be carried in the pocket. The buttons are slightly tacky to feel but are well-placed. The optical viewfinder is at the extreme left, just above the lens, so you have to place your fingers carefully. It has a 2x digital zoom that lets you shoot close-up photos despite the absence of optical zoom. It has a 1.6-colour TFT LCD, but it darkens in the sunlight. The camera has a Video Out jack and a USB port and includes a video connector RCA cable along with a USB cable. It has 16 MB internal memory and can accommodate 20 to 23 pictures at maximum resolution. You can increase the capacity by using a 64 MB Compact Flash card. The camera supports a wide range of power options with an in-camera charging option through the camera dock, two AA lithium or Ni-MH batteries



or one CRV3 lithium battery. The camera comes with an optional docking stand that also serves as a charging dock. A file transfer button on the dock makes sharing files very simple. The only sore spot is that Kodak did not provide a cover for the camera.

In our tests, the CX4200 was able to capture all the details but without the flash, the picture looked dark. In the resolution test, the image came out hazy. Though the camera has good colour reproduction, the overall image quality is poor.

Overall, this camera produces sharp and colourful images when used in well lit conditions, but if you want clarity and picture depth at high resolution, then this camera is surely not for you.

SPECIFICATIONS

16 MB internal memory, MMC/SD slot, 2 megapixel resolution, 2x digital zoom, 1.6-inch TFT colour LCD screen, 220 gm weight, JPEG/EXIF v2.2 compression

Kodak CX4200		B
Performance	▶▶▶▶▶	
Build quality	▶▶▶▶▶	
Value for money	▶▶▶▶▶	
Features	▶▶▶▶▶	
OVERALL	▶▶▶▶▶	

Price: Rs 13,900

Contact: Neoteric Infomatique

Phone: 022-24172600

Fax: 022-2418 5294

E-mail: sales@neoteric-info.com

Web site: www.kodak.com

Iomega CD-RW 48x24x48x USB 2.0 Drive

Write on target

The Iomega is an external USB 2.0 CD-Writer. The back panel has the USB, PS/2 look-alike power connector and Audio Out jacks. The power connector is unique to this model and could pose a



problem if the cord gets damaged as you can only obtain it from Iomega. The device is USB 2.0 ready and is capable of 48x write and read speed and a 24x rewrite speed. The only bottleneck is the

rare 48x media.

The writer burned 700 MB of assorted data at 40x in just 3 minutes, 18 seconds. It took a little under 3 minutes to burn a 610 MB ISO image and 7 minutes, 27 seconds to rewrite 700 MB at 12x—pretty good for 12x and once 24x media is easily available, the results will be even better.

In its CD-ROM drive incarnation, it copied the 700 MB of data on the ATA100

Price: Rs 9,900

Contact: Neoteric Infomatique

Phone: 022-2417 2600

Fax: 022-2418 5294

E-mail: sales@neoteric-info.com

Web site: www.iomega.com

drive in just 2 minutes, 57 seconds. This product is a good buy for those who need a portable writer that does justice to its price of Rs 9,900.

SPECIFICATIONS

External USB 2.0 interface, 48x write and read speed, 24x rewrite speed
System Requirements: Pentium 166 MHz processor, Windows 98/Me/2000/XP, 75 MB hard drive space

Iomega CD-RW		B+
Performance	▶▶▶▶▶	
Build quality	▶▶▶▶▶	
Value for money	▶▶▶▶▶	
Features	▶▶▶▶▶	
OVERALL	▶▶▶▶▶	

Canon Canoscan LiDE 20

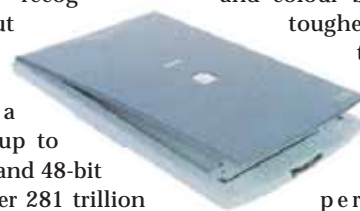
Standing slim

The LiDE 20 is a sleek, intuitive and user-friendly scanner. The installation is quite easy—Windows XP recognised it without any hassles. You can scan in colour at a resolution of up to 600x1200 dpi and 48-bit depth with over 281 trillion possible colours. It can also be placed vertically while scanning, thus saving on desktop space. It has a USB 2.0 interface and hence requires no external power adapters.

Its Multi scan mode scans all the pictures in a single pass and each image is saved in a separate file. It even adjusts any misaligned photographs to ensure precision in your scanning. Enhanced software allows scanned images to be written directly to a CD.

As far as speed is concerned, it completed a full

colour scan in a fast 47 seconds. The colour output was also quite bright and matched the original. Even contrast and colour blending, the toughest attributes to achieve, were quite remarkable. Overall, its performance, combined with the price of just Rs 4,370 makes it quite an irresistible buy.



SPECIFICATIONS

600x1200 dpi optical resolution, 9600x9600 dpi interpolated resolution, 8.5x11.7 inch scan area, 48-bit colour depth, USB 2.0 interface. Package includes USB cable, Scanner stand and Canon Documentation Kit with CD containing ScanGear CS (Windows/Mac) CanoScan Toolbox (Windows/Mac) ArcSoft PhotoStudio, ArcSoft PhotoBase and ScanSoft OmniPage SE

Canon Canoscan LiDE 20		B+
Performance	▶▶▶▶▶	
Build quality	▶▶▶▶▶	
Value for money	▶▶▶▶▶	
Features	▶▶▶▶▶	
OVERALL	▶▶▶▶▶	

Price: Rs 4,370

Contact: Canon India Ltd

Phone: 011-6806572

Fax: 011-680 7180

E-mail: brijesh.verma@canon.co.in

Web site: www.canon.co.in

Norton Ghost 2003

Your friendly neighbourhood ghost

Norton Ghost 2003 facilitates backup, restoration and cloning data for disaster recovery. With the new release, even NTFS partitions in Windows NT environment can be backed up and restored. It also supports backing up, restoring and cloning EXT3 file systems in Linux.

To perform all these tasks, Norton needs to copy all the required files in the virtual partition it creates. This is a space constraint on the Master Boot Record (MBR), which is the location of the partition.

The disaster recovery facility lets you prepare a bootable disk, which you can use to start the computer.

Unlike the previous version where you had to back up the entire drive, Norton Ghost 2003 lets you back up just the partitions.

Another important addition is the support for external USB drives. Norton Ghost also

provides a unique feature of letting you explore the contents of an image file as if it were a folder on a local drive. You can even check the integrity of the image file as soon as it is backed up, before proceeding to restore.

What the software lacks is an intuitive interface and a scheduler for taking backups. Its interface is limited to the wizards for setting up new tasks; after that it reverts to a DOS-based system, effectively bringing the system to a standstill as you cannot multitask.

Though a good product, it is always better to buy the complete system suite rather than just an individual product. Besides, for first time users, there are other easier-to-use software available.

SPECIFICATIONS

486 processor, VGA monitor, 16 MB RAM, Windows 98/2000/Me/XP/NT4 SP6a, Internet Explorer 5



Price: Rs 2,633
Contact: Symantec
Phone: 022-26570658
E-mail: adeshpande@symantec.com
Web site: www.symantec.com

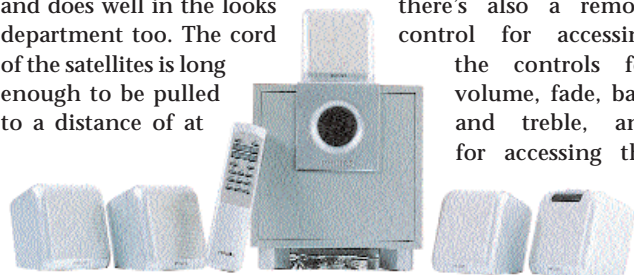
Norton Ghost 2003	
Performance	▶▶▶▶▶
Ease of use	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Philips A5.600

The power of six

The Philips A5.600 5.1-channel speaker offers good quality surround sound and does well in the looks department too. The cord of the satellites is long enough to be pulled to a distance of at

least 15 feet from the PC. The set has digital volume control on the centre speaker and there's also a remote control for accessing the controls for volume, fade, bass and treble, and for accessing the



other features.

The speakers were very responsive in the low, mid and high frequencies—something that Indian music lovers will appreciate. It gave good results when VOB files were played using PowerDVD—the sound effects were quite thrilling when playing games such as *Quake III Arena* and *Need for Speed: Porsche 2000*. However, the real power of these speakers is evident while playing rock or heavy-metal music.

Price: Rs 7,500
Contact: Philips Sound Solutions
Phone: 020-7124196
Fax: 020-7123175
E-mail: pss.sales.marketing@philips.com
Web site: www.philips.com/sound

The only thing missing from this speaker set are the stands for the satellites. The A5.600 is expensive at Rs 7,500, but you wouldn't mind the price if crystal clear, booming sound is what you crave.

SPECIFICATIONS

50 watts RMS power output for subwoofer, 10 watts RMS for the satellites, 40 Hz-20 KHz frequency response, five satellite, one subwoofer, unified 5-channel chord, audio cable, remote with batteries, manual

Philips A5.600	
Performance	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

WinTally-Acc

Tally ho!

WinTally-Acc is an easy-to-install, versatile accounting system. It provides a standard graphical Windows interface and anyone with basic knowledge of Windows can start working with the software. The tree view interface makes it easy to locate a report from among the hundreds of files. Also, the use of graphical representation and icons makes the interface very interactive.

The software has a lot of features that can be enabled or disabled depending on your requirements. It has special features such as the ability to lock the year field when finalising the accounts for a particular year. The Repair Company command creates an auto-

matic backup on a user-specified day and time. You can also choose to display any statement as per the required data.

With the capability to print, e-mail, save and publish any displayed screen, this is a very handy utility.

Its one glaring flaw is that the data is not very safe as the database used is MS Access, which can be edited very easily. However, the Auditing command records all actions, helping you keep a check on the editing changes done by other users.

Overall, this is a feature-packed, easy-to-use software, but the price is a bit on the higher side.

SPECIFICATIONS

Pentium 233 MHz processor, 64 MB RAM, high colour settings, 20 MB hard disk space

Price: Rs 7,500 (single user); Rs 11,500 (10 users)
Contact: Lify Pvt Ltd
Phone: (0) 98220 16457
Fax: 022-2237 5845
E-mail: lifycom@lify.com
Web site: www.lify.com



WinTally-Acc	
Performance	▶▶▶▶▶
Ease of use	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

VariCAD 8.2-0.4

Designs on you

VariCAD 8.2-0.4 is a fast, compact and economical mechanical CAD package featuring true 3D modelling, solids and spatial analysis, 2D to 3D and 3D to 2D projection and extrusion, parametric symbol and mechanical part libraries and surface development utilities. It can be installed as a stand-alone application or on a server and networked in peer-to-peer and client-server configurations.

Most functions are presented as icons and also in the menu bars. When working in a networked environment, each user can customise the menus and icons according to their liking.

The software imports and exports common CAD file types (DWB, DWG, DXF and IGES). The files can be con-

verted individually or as whole directories. You can also use file name filters. Thus, you can transfer a whole drawing documentation using one command line.

For a high price of Rs 19,950, it delivers a strong value, though the learning curve is rather steep. However, the software provides tool tips and well-crafted samples of program features to make the learning curve easier. The application is also demanding on your system—make sure you have the requisite hardware to work smoothly with this application.

SPECIFICATIONS

Pentium II processor, 128 MB RAM, 16 MB graphics card with hardware support for OpenGL graphics

VariCAD 8.2-0.4	
Performance	▶▶▶▶▶
Ease of use	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Price: Rs 19,950
Contact: G T Enterprises
Phone: 080-660 6093
Fax: 080-633 1047
E-mail: gtcadrom@vsnl.com

DFI NT72-SA Motherboard

All aboard the DFI express

DFI's NT72-SA motherboard aims to provide an RDRAM and RAID solution at a reasonable price, utilising the Intel 850E chipset. There are four RDRAM slots (RIMMs) that can support 2 GB of system memory. One convenient feature is the inclusion of two Continuity RIMMs (CRIMMs). Another distinguishing feature is the two-channel onboard Promise ATA RAID controller that supports RAID 0 (striping) or RAID 1

(mirroring) modes.

In the benchmarking tests, the board performed well in data transfer tests. SiSoft Sandra 2003 Pro reported a disk index of 28,766, while PC Mark reported a disk index of 972. This is pretty good considering the system configuration. If you use the RAID controllers, you can expect the indices to be better still. The benchmarks also reported a sequential read time of 42 MBps, ran-

dom read time of 7 MBps, sequential write speed of 41 MBps, and random write speed of 10 MBps. HDTach confirmed this with a maximum read speed of 44.6 MBps, utilising only 9.5 per cent of the CPU.

The *Quake III Arena* test saw an fps of 285.8 in normal mode and 281.9 in high quality mode, but dropped to 232 fps in maximum quality settings. The system took 97.54 seconds to convert a 52 MB MPEG file into the DivX format. The real attraction of the DFI is its integra-

Price: Rs 7,950
Contact: Zeta Technologies
Phone: 022-2410 2288
Fax: 022-24102277
E-mail: tejasa@zetaindia.com
Web site: www.zetaindia.com

tion of onboard RAID and an RDRAM solution, and the price tag of Rs 7,950 seems justified.

SPECIFICATIONS

Two-channel audio codec (but no onboard graphics); integrated Ethernet controller; AGP 4x slot; five PCI slots; one CNR slot; two PS/2, two serial, one parallel port and two USB ports (expandable to 4), connector for optional IrDA interface; the RAID controller and driver CD; three IDE ATA/100 cables, floppy disk cable, RAID driver floppy diskette and I/O shield

DFI NT72-SA Motherboard	
Performance	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Creative NOMAD MuVo

Gypsy player

The MuVo portable MP3 player doubles up as a removable USB drive. It has a separate battery pack.

Installation is simple and Windows 98 detects the player and configures it as a removable drive. Windows Me and later versions do not require you to run the installation program.

The model that we tested had 64 MB of storage. This translates into slightly over an hour of playtime. It has a good power consumption and the battery held up even after 9 hours of use. Unfortunately though, it is not equipped to shuffle or program your playlist.

Another sore point was

the frequency response of the earphones—although high frequency reproduction was excellent, bass frequencies took a beating. Crank up the volume to the fullest and you get ear-splitting distortion-free sound.

The player doesn't have ID3 support or an LCD screen, something we've come to expect from an MP3 player.

The Creative NOMAD MuVo can dish out some pretty high decibels. The 64 MB version of the MuVo costs a whopping Rs 11,299.

SPECIFICATIONS

64 MB internal memory, neck strap, earphones, manual, driver CD, battery pack, USB interface

Creative NOMAD MuVo	
Performance	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Price: Rs 11,299
Contact: Cyberstar
Phone: 022-26556178
Fax: 022-2655 6181
E-mail: sushilb@cyberstarin.net
Web site: asia.creative.com

Mercury HT 5800R Home Theatre 5.1 Channel System

Drowning in sound

Though this 5.1 channel system has a 5,800 watts PMPO, it has only 25 watts RMS for the satellites and 50 watts RMS for the subwoofer. The RMS power gives you an idea about the actual sound



output that the system can achieve without distortion, whereas the PMPO output indicates the maximum output achievable by the system, albeit with distortions.

The wires are long enough, and speaker stands and wall mountings are provided as well. One shortcoming is the ridiculously short power supply wire.

The system provides good performance and at Rs 7,000,

it offers good value for money. The subwoofer is quite powerful and you can crank up the volume without experiencing too much distortion. If you're looking to own a 5.1 speaker system, but are

constrained by your budget, the Mercury HT 5800R offers a decent enough solution. However, if you cannot settle for anything less than perfect sound, give this one a miss.

SPECIFICATIONS

Four satellites at 25 W RMS, one subwoofer at 50 W RMS, wall and stand mounts, remote control with batteries

System Requirements: Sound-card with 5.1 channel output

Mercury HT 5800R B	
Performance	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Price: Rs 7,000

Contact: Kobian India Ltd

Phone: 080-5566626

Fax: 022-5566625

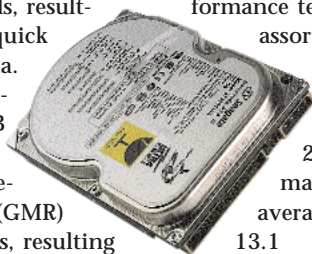
E-mail: rohit@kobian.com

Web site: www.kobian.com

Seagate ST3120023A (120 GB Barracuda)

Speedy Gonzales

Seagate's 120 GB Barracuda hard disk supporting ATA V with a spindle speed of 7,200 rpm, has two platters of 60 GB each and four read/write heads, resulting in very quick retrieval of data. It sports a standard 2 MB buffer and uses Giant Magnetoresistive (GMR) recording heads, resulting in greater areal density, which makes larger disk sizes achievable.



The drive was tested on a Pentium 4-based test bench, with a 2.8 GHz CPU, Intel

D850 EMV2 motherboard with 256 MB RDRAM, and a GeForce4 Ti 4600 graphics accelerator. This drive gave us excellent results in the performance tests. It transferred assorted data of 1 GB in a mere 57 seconds. The SiSoft Sandra 2002 Pro benchmark reported an average access time of 13.1 milliseconds, sequential read/write rates of 41/40 MBps, and random read/write speeds of 8/9 MBps, which is indeed very good. Photoshop 7.0 took a mere 12 seconds to load and

it opened a 190 MB image file in 14 seconds, which highlights the file transfer speed of the drive.

The disk took 14.2 seconds to load a saved game in *Return to Castle Wolfenstein*. This is especially good news for impatient gamers. There really aren't any drawbacks to this drive, except for perhaps its price. If you do not need the maximum storage space that money can buy, but you

Price: Rs 12,500

Contact: Seagate Technology

Phone: 1600 331104 (toll free)

Web site: www.seagate.com

Liteon LTR55246S

Not to be taken lightly

Liteon has introduced a new 52x Writer, the LTR55246S. It is surely one of the fastest writers/re-writers available today. In fact, in the Indian market, as of today, there are no CD-Rs that can support a writing speed of 52x. The maximum writing speed supported by media available today is 48x.



Its build quality is pretty average. A design on sturdier lines would have been appreciated. It has a standard 2,048 KB buffer. The buffer underrun prevention technology used by Liteon is SMART-BURN, which is also used for the optimisation of the CD burning process, to ensure that data is written accurately on to the CD-R/CD-RW.

The test was performed on a Pentium 4 2.2 GHz CPU, running on an MSI Max2 BLR motherboard, with 256 MB DDR RAM and a Radeon 8500 accelerator. In all of the tests,

do want all the speed you can get, then this is the drive for you. As far as storage goes, it sits smack in the middle of the gap between the low-end 40 to 80 GB dwarves and the top-end 160 to 200 GB giants.

SPECIFICATIONS

ATA V support, 7,200 rpm, 120 GB, 2 MB buffer

Seagate ST3120023A B+	
Performance	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

the Writer performed at the maximum speed that the CD-R medium would allow. Nero CD Speed reported minimum, average and maximum speeds of 24.24x, 39.34x and 41.31x, respectively. There weren't any hitches at any stage of the other tests either, proving the quality and capability of the Writer.

What's more, at Rs 5,145, it's a pretty good deal as well. Considering it is one of the world's fastest writers, that's not a bad price at all. If you happen to have a raging fast machine that can support the data speeds required by this CD-Writer, then by all means, go for it.

SPECIFICATIONS

Write/re-write/read speed: 52x/24x/52x, 2,048 KB buffer, SMART-BURN technology for optimum writing, includes Nero - Burning ROM v 5.5.

Liteon LTR55246S B	
Performance	▶▶▶▶▶
Ease of use	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
OVERALL	▶▶▶▶▶

Price: Rs 5,145

Contact: Mediatech India

Phone: 022-239 6696

E-mail:

sales@mediatechindia.com

Web site: www.liteon.com.tw

Fistfuls of Power

Agent 001 scouts the market for a handheld device that fits his pocket

It was one of those mornings where you get up feeling something essential is missing. I checked to see if all my appendages were in place, they were. My trademark goatee then? No, that felt right too. Then suddenly I hit upon it, I didn't have a handheld! Oh the shame of it all, me being a techno-geek and all that. Of course, I did need it for the practicality of being connected to my data and information wherever I went, but that's secondary. A handheld I want and a handheld I shall get. First stop, to the bank. Turns out I have just enough, so off I go.

Before I indulge myself, I chalk out the list of functions I intend to use my new toy for. Hmm, I need it for reading my e-books and Web pages, and it must have good organisation capabilities to make sense of my chaos. A little ability to synchronise with other external applications wouldn't hurt either—all this at the lowest possible price, of course.

The most affordable device in the market right now is the Palm m100 priced at Rs 6,000. Though its specifications are showing signs of age—2 MB of memory and a basic monochrome screen doesn't really allow much, but is suited to text-based applications. Placed a notch higher is the Palm m105 with 8 MB of memory, costing Rs 8,500. But there's a new kid on the block, the funky Palm Zire made for first time users. However, none of the dealers I spoke to in Andheri, Mumbai, would give away its price.

Next up, I spotted the Palm m125 monochrome with expansion slots for MMC and Secure Digital cards. This one had 8 MB of memory and came with the mandatory set of organisation software and synchronisation via infrared and USB connectivity. The Palm m130 is also sim-

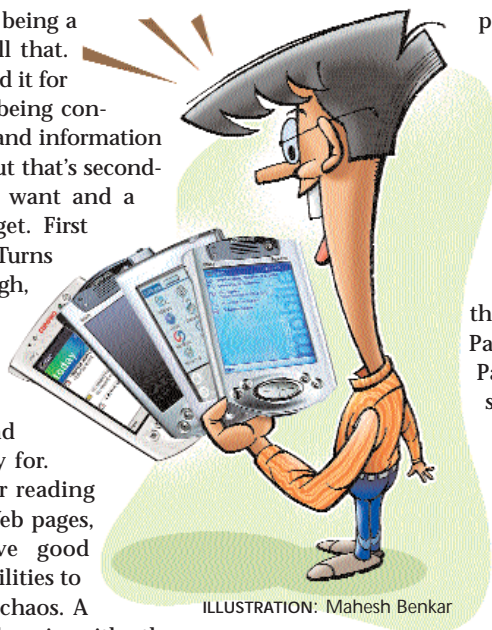
ilar but it has a slightly bigger colour screen. The Palm m125 uses AAA batteries, while the Palm m130 uses rechargeable Lithium Ion batteries and has very good battery life. The m125 costs around Rs 11,000, while the m130 is priced at

around Rs 13,500. The prices are about Rs 500 to Rs 1,000 more in the white market and you get the advantage of a solid warranty and a boxed package.

Still higher are the popular 500-series Palm devices. The Palm m500 has a sharp monochrome screen with 8 MB of memory, a faster processor than the m1xx series and is one of the lightest devices available. The colour device in this range was the Palm m515,

which has 16 MB of memory and uses a rechargeable Lithium Ion battery with Flash ROM upgrade capabilities. The m500 is priced at around Rs 18,000 while the colour m515 comes in at around Rs 23,000. On the higher end, the new Palm Tungsten T device has an ARM-based processor and a crisp colour display. It runs the latest Palm OS 5 software and is packed to the gills with features such as 16 MB of memory, Bluetooth, voice memo, headset jack and even cellular phone capabilities. All these features obviously mean a high price, but here too, none of the dealers had any information.

I even checked out the Pocket PC arena, but most the dealers stocked only the Compaq iPAQ series of handhelds, with the iPAQ 3800 being the most popular choice. It comes with 64 MB of memory and runs Microsoft Pocket PC 2002. With full multimedia capabilities



■ **Memory:** Depending upon the types of applications you plan to use, a handheld's integrated memory could run out faster than you would imagine. You will need at least 4 MB of memory for text-based applications and 16 MB for storing media files.

■ **Compatibility:** Your handheld should support your applications and be able to exchange information with your desktop PC and other handheld devices.

■ **Expandability and upgradability:** Choose handhelds that allow the OS to be upgraded. Look out for ones that allow the firmware to be upgraded through Flash programs.

■ **Screen size and resolution:** Monochrome screens are suited to most applications; colour screens are for those who intend to work with graphics and video files. Look for a colour screen with good resolution, clarity and brightness, and one that is clearly legible in the dark as well as in bright light.

■ **Battery life:** Rechargeable Lithium Ion batteries are preferable for longer on-road life. Even if it uses conventional alkaline batteries, make sure it has a run time of at least 10 hours.

■ **Integrated features:** Opt for devices with additional features such as a cellular phone or camera only if you are going to actually use them. These frills add significantly to the cost.

(yes, it can play back MP3s as well as movie clips), a full colour screen and plenty of application and organisation software, it does full justice to its price tag of Rs 33,000. Similar in capabilities are Pocket PCs from other brands such as Toshiba, Casio, HP, etc. However, none of them came lower than Rs 25,000. Oh well...

Acknowledging that the world of Pocket PCs held nothing for me, I settled for the Palm m125. It suited my needs quite well and left me with enough money to get back home! 🏠



Intense graFX!

Are we ready for a no-holds-barred cinema quality gaming experience? Or will the GeForce FX prove to be yet another video card with simply faster memory and processing speed?

Movies such as *Final Fantasy* and *Jurassic Park* left us gaping with their colourful tapestry of digital animation. The 'rendering farms' used to create these magic movies comprise new-age rendering supercomputers that run on advanced processing capabilities. Enchanted by such movies, the aim of every game designer and graphics hardware manager has been to bring this realism to a gaming experience. And this is exactly what the new GeForce FX aims to deliver.

While there has been no dearth of capability and programming skills to accomplish this, graphics cards were not capable of processing this vast amount of information at a pace faster than that of a slideshow. Over the years, every new card has tried to achieve realism with varying degrees of success. Hence the launch of a new graphics card usually generates more excitement in the IT community than any other hardware. Often, the revelation of the card's

specifications shows it to be merely an enhancement of the existing technology—made faster by upping clock speeds and adding more rendering pipelines, or conversely, by chopping a couple of components to make the card accessible to different market segments.

Enter the GeForce FX

The GeForce FX is built using a 0.13-micron fabrication process unlike the 0.15-micron technology used by the reigning king of graphics hill, the ATI Radeon 9700. The smaller fabrication process makes it possible for this card to be laden with 125 million transistors—compare this with the 108 million transistors used by the Xeon MP processor. While this fabrication process does offer greater density for packing in more transistors and

lower heat emission levels, it is a difficult process to implement.

This has been the primary reason for the cards delay—it was supposed to be released by December 2002, but the date has now been pushed forward to mid 2003. Also, this card complies with and even exceeds the specifications of the upcoming DirectX 9 API—while DirectX

9 will allow for a far greater effects and capabilities for tomorrow's games and applications, the GeForce FX will be able to take advantage of future graphics APIs as well. Therefore, when tomorrow's games and applications support these new capabilities, only cards such as the GeForce FX will be able to take full advantage of their visual splendour.

Let's take a look at some of the newer tech- ➔

info

The pixel shader in the GeForce FX can process 51 billion floating point operations per second. This...

- Can render over a hundred Jurassic Park dinosaurs at 100 frames per second
- Has more floating point power than a Cray SV-1 supercomputer
- Is 120 times the distance from the Earth to the Moon, if converted to metres



The GeForce FX can spell all the difference between a frown and a wry smile. The effect is apparent, as modelled by Dawn, the pixie mascot of the GeForce FX

nologies that help deliver this promise of cinema-quality gaming.

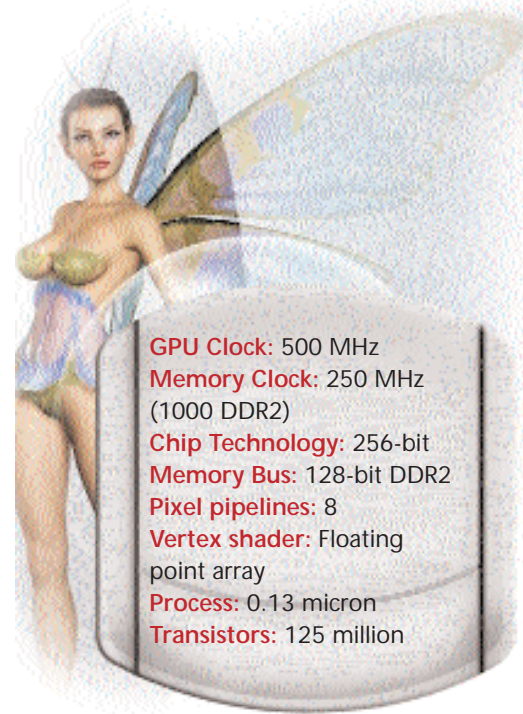
Parallel vertex shader and pixel pipelines

The vertex shader is the element that allows complex meshes and 3D objects to be created within games. In the GeForce FX, this component was created from scratch—while the GeForce 4 had two separate vertex shader units, the GeForce FX

features just a single pipeline. This singular pipeline is equipped with parallel floating point units that work together to deliver a claimed triangle processing rate of 375 million triangles per second (compared to the Radeon 9700's 325 million triangles per second). When coupled with the DirectX 9 specification, the card can process vertex shader programs while using 65,536 instructions (the GeForce4 Ti class cards uses only 128 instructions), constants and loops (primitives that are used in the creation of these programs). So what does all this translate into? While earlier cards allowed only for models with increasing polygon counts, the advanced vertex shading techniques of the GeForce FX will make even facial expressions possible.

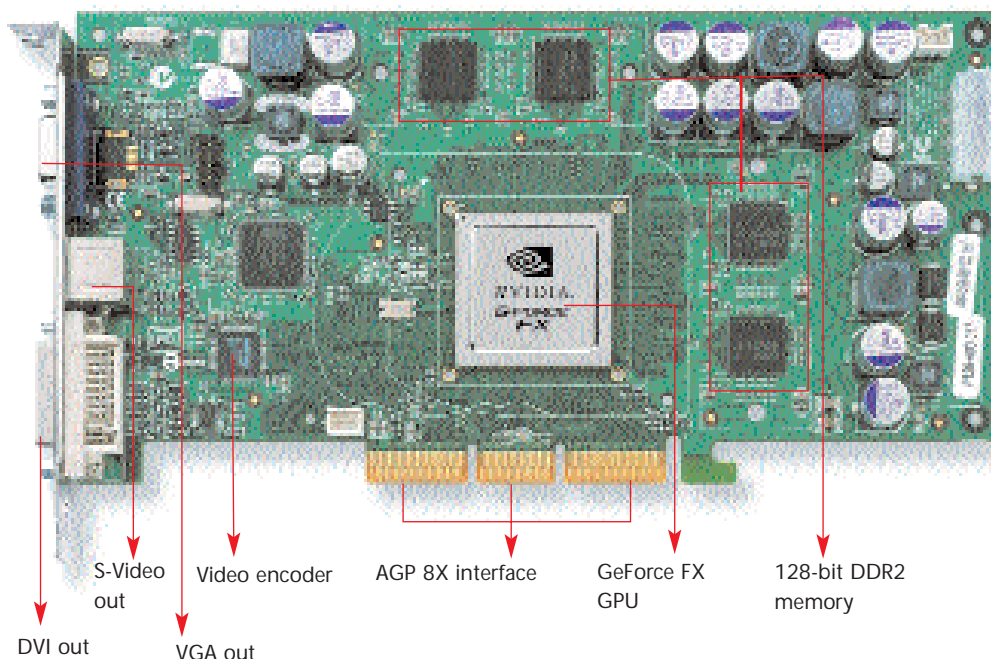
While vertex shader warrants greater flexibility and innovation in modifying meshes and therefore greater realism, the pixel shader does wonders for the textures and special effects on the surfaces of these 3D models. Everything from the mouldy rusted iron girders to the clammy, cold texture of an alien's skin will be defined using these new innovations.

The pixel shader unit of the processor in the GeForce FX has been considerably revamped to add functionality for the DirectX 9 API. Also, pixel shader programs can now use up to 1,024 instructions with up to 16 textures per pixel, allowing for very complex effects on the 3D model surfaces. Some of the new pixel operations are soft shadows on 3D models and frame-



GPU Clock: 500 MHz
Memory Clock: 250 MHz
 (1000 DDR2)
Chip Technology: 256-bit
Memory Bus: 128-bit DDR2
Pixel pipelines: 8
Vertex shader: Floating point array
Process: 0.13 micron
Transistors: 125 million

buffer post processing effects such as blurs and halos (from streetlamps and car headlights). Programmers can also assign functions to certain textures to call upon specific effects and actions. Volumetric rendering can be implemented through algorithms for generating effects such as smoke, fire, fur, grass, etc. Complex lighting effects can be achieved over a single pass as opposed to using up many clock cycles for rendering a given light effect. Finally, the pixel shader also features 64 temporary registers (compared to 12 for the Radeon 9700), which are used for storing complex instructions that are sent to the graphics processor.



DDR2 memory

Another big advantage is the support for DDR2 memory. Operating at a blistering 500 MHz frequency on a 128-bit data bus, this interface offers a 16 GBps bandwidth. Even though the memory width is lower than that of the Radeon 9700, the effective bandwidth is higher for two reasons: the effective frequency is higher with the DDR2 memory and every bit of data that comes out of the rendering pipeline is compressed in the hardware before being sent to the memory. On an average, nVidia states that there is a 4:1 compression ratio that occurs and therefore, the resultant memory bandwidth of the card is effectively raised to 48 GBps—that's the contents of an entire

40 GB hard disk transferred in a little under a second!

Intellisample technology

While most of the pixel and vertex specifications are focused on DirectX 9, the pixie dust here is a technology called Intellisample that will make even games such as *DOOM III* run faster. Intellisample is a comprehensive set of technologies that includes a new colour compression engine, improved fast z-clear, dynamic gamma correction, adaptive trilinear and anisotropic filtering, and anti-aliasing.

The GeForce FX maximises its memory bandwidth by compressing all the data that comes out of the rendering pipeline before sending it to the memory controller (as described above). This results in a direct increase in effective memory bandwidth, allowing for larger and more complex textures. This is noticed especially when anti-aliasing is enabled, where the demands placed on the memory bandwidth are greater. There is a newer algorithm for clearing the z-buffer (for getting rid of obstructed or invisible polygons), resulting in faster frame processing. Finally, the card uses various methods for implementing filtering options. The user can choose between a direct filtering



The level of detail in the environment and skies is made realistic by the GeForce FX's ability to process a large number of polygons at high speeds

option (trilinear or anisotropic), or a less accurate but a high performance option. This will result in a lower performance hit compared to running the card in any one of these filtering modes directly.

Faster core and memory speeds

When it debuts, the GeForce FX is expected to have a core speed of 500 MHz and a memory speed of 250 MHz (effectively 1 GHz due to the 4x increase, being DDR2). This is significantly higher than the Radeon 9700's core speed of 325 MHz and 310 MHz DDR memory.

In newer games such as *Stalker* or *Ral-*



The enormous air intake duct and heat pipe solution help keep the GeForce FX cool


liSport, the realism in the models and environment is unprecedented due to the use of very high polygon-count. Also, the 128-bit colour support allows for hitherto unseen levels of accuracy in colours and specular highlights in the game.

FX flow

Given the high core and memory speeds, the card needs to breathe well. Hence, it uses an advanced cooling system involving the use of heat pipes. In addition to a heat sink on the critical heat-generating components such as the GPU and memory chips, there are tiny copper pipes that draw the heat away from these elements. This is implemented through a special air-flow duct in conjunction with the cooling fan, resulting in a large cooling assembly that takes up the space of two slots in your cabinet!

The last word

Every once in a graphics era comes a product that offers not only high clock speeds or more memory, but truly intelligent technology with a specific goal and uses innovative methods to attain it. nVidia's GeForce FX is one such product that represents a new species of graphics hardware built to redefine desktop graphics.

While all this technology scientifically translates into more pixels per second, greater colour depths and better filtering, the truth will be bared when we see shimmers on water and winking characters on our desktops. Though this card will be out of our financial reach, in time, the technology will trickle down to more affordable solutions. So be prepared for the time when you can feel the knot in the pit of your stomach while you watch a gleaming Lamborghini Murciélago tear down your screen—the only difference being that instead of watching this with a bag of popcorn, you'll be holding a joystick in your hand! 

MARCO D'SOUZA

Old vs New			
Specification	nVidia GeForce FX	ATi Radeon 9700 PRO	nVidia GeForce4 Ti4600
Chip technology	256-bit	256-bit	256-bit
Process	0.13 micron	0.15 micron	0.15 micron
Transistors	125 million	107 million	63 million
Memory bus	128-bit DDR2	256-bit DDR	128-bit DDR
Pure memory bandwidth	16 GBps	19.8 GBps	10.4 GBps
Pixel fillrate	4 Gigapixel/s	2.6 Gigapixel/s	1.24 Gigapixel/s
Anti-aliased Fillrate	16 billion AA samples/s	15.6 billion AA samples/s	4.8 billion AA samples/s
Max FSAA mode	8x	6x	4x
Triangle transform rate	350 million triangles/s	325 M million triangles/s	69 M million triangles/s
AGP bus	1x/2x/4x/8x	1x/2x/4x/8x	1x/2x/4x
Memory	128/256 MB	128/256 MB	128 MB
GPU clock	500 MHz	325 MHz	300 MHz
Memory clock	250 MHz (1000 DDR2)	310 MHz (620 DDR)	325 MHz (650 DDR)
Memory	BGA 2.0 ns	BGA 2.9 ns	BGA 2.8 ns
Vertex shader	FP Array	4	2
Pixel pipelines	8	8	4
Texture units per pipe	1	1	2
Textures per texture unit	16	8	4
DirectX generation	9.0 (+)	9	8
Optimisations	LMA II optimised colour compression	Hyper Z III	LMA II

A picture speaks a thousand words

Draw a picture and hide a book of thoughts within, using steganography



IMAGING: Atul Deshmukh

Fishing freshwater bends and saltwater coasts rewards anyone feeling stressed. Resourceful anglers usually find masterful leapers fun and admit swordfish rank overwhelming anyway.

Still trying to figure out what this means? This is a crudely encrypted message for communicating secretly with someone. By taking the third letter in each word, the message reads: "Send Lawyers, guns and money."

To some degree or the other, we are all familiar with the art of stealthy communication and passing secret messages. We've done it in school, devising 'secret' code like the one shown above to communicate with an exclusive band of friends. We've read about it in spy thrillers—from fairly low-tech

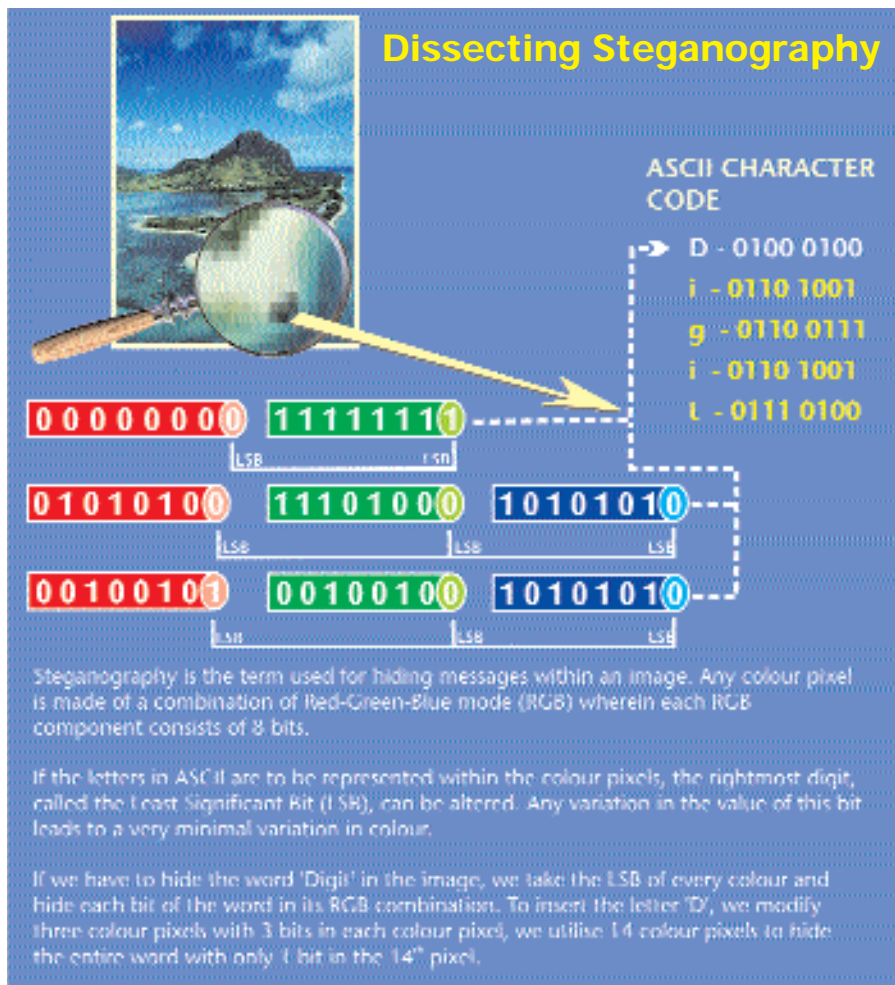
methods like hiding information about traitors to the French revolution in a piece of knitting (*A Tale of Two Cities*), invisible ink, ultrawide radio transmissions that hide messages within noise-like signals and what have you. We've tried to secure our own communications by hiding information through encryption. And now there's another subset to the art of keeping it secret—steganography.

Stegano...what?

The word Steganography literally means 'covered writing'. The technique dates back to the ancient Greeks who sent information by scraping the wax off a tablet and writing a message on the underlying wood. The tablets were then covered with wax again, rendering them innocent when inspected by the sentries. In modern times, the technique works to camouflage information. You can hide data

Steganos Security Suite 4,
S-Tools 4
Find them on the Mindware CD





Message in a bottle

There are different kinds of carriers, which can carry your message across mediums. The earliest form of steganography was hiding messages in text. With the evolution of multimedia applications, it became easier to hide messages in still images since these are larger files. Audio and video carrier files are less perceptible, hence providing higher invisibility. The technique of steganography is more or less the same in each carrier file.

Messages in text: Secret messages can be hidden in text format by reframing the text of the carrier file, while maintaining the context. One form of Steganography is a program called Spam Mimic. Based on a set of rules called a mimic engine by Peter Wayner, it encodes your message into what looks just like your typical, quickly deleted spam message. However, hiding a message in plain text is a thing of the past, as people are suspicious of irrelevant text.

Messages in still images: This is the most popular method of steganography as minor changes in colour are unnoticeable to the human eye. Outguess, a universal steganography tool, comprises data-specific handlers (code) that extract redundant bits in an image and write them back after modification. Outguess can use any kind of data file as a carrier, as long as a handler is provided. The amount of message that can be encrypted depends upon the size of the carrier.

Messages in audio: Messages in audio are always sent along with ambient noise. The data is hidden in the heart of the Layer III encoding process of an MP3 file, namely, the inner loop during compression. The inner loop limits the input data and increases the step size until the data can be coded with the available number of bits.

within still images, audio or even video. Steganography software store the classified information in the least significant bits of a digitised file, bits that can be changed in subtle ways that cannot be detected by the human eye or ear.

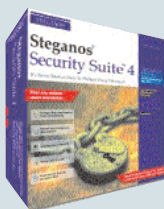
The information is first encrypted as a data file. Once you have this, you need

to select a carrier file on which the data file can be encoded. The carrier file can be any graphic or audio file eight times the size of the data file. For example, one could hide information in, say, the nose of a puppy on a pet-adoption Web site. The intended recipients can then extract the information.

Stegano Tools

Various tools are available for concealing and sending messages using steganography. Some of the commonly used tools are:

- Steganos Security Suite 4 uses powerful 128-bit encryption. It would take 1 billion powerful computers millions of years to try every combination to gain access to your personal information. This software uses steganography along with encryption to completely secure your data.
Web site: www.steganos.com



- Datamark Technologies has a number of products lined up for steganography. They currently market four digital steganography products, namely, StegComm for confidential multimedia communication, StegMark for digital watermarking storage media, StegSafe for digital storage and linkage, and StegSign for e-commerce transactions.

Web site: <http://www.datamark-tech.com/datamark.html>

- Blindside is an application of steganography that allows you to conceal a single file or set of files within a standard computer

image. The new image looks identical to the original, but can contain up to 50 k of data. The hidden files can also be password encrypted, to prevent unauthorised access.

Web site: <http://www.blindside.co.uk>

- MP3Stego hides information in MP3 files during the compression process. The data is first compressed, encrypted and then hidden in the MP3 bit stream. Although MP3Stego was written with steganographic applications in mind, it can also be used as a copyright marking system for MP3 files.

Web site: <http://www.cl.cam.ac.uk/~fapp2/steganography/mp3stego>



A digital watermark embedded in an image

The data is first compressed, encrypted and then hidden in the MP3 bit stream. An outsider, however, can attack it by uncompressing and recompressing the bitstream, deleting the hidden information with severe loss to quality.

Messages in video: Embedding information into multimedia data has gained increasing attention lately. The method of encryption is the same as in audio steganography. Video files are generally very good carrier files since they have a lot of irrelevant bits.

Steganography and watermarking

Steganography also enables an evolved form of watermarking. Usually, covert channels in the carrier file carry hidden data unrelated to the content in which it is embedded, but digital watermarking holds information about its carrier medium and is broadly defined as an imperceptible insertion of information such as a number or text into a multimedia file through slight data modification. This process has gained huge acclaim from the media for enabling copyright for their products.

The Law Effect

The World Intellectual Property Organization (WIPO) has drafted a treaty, which requires countries to penalise those who remove digital watermarks. The Digital Millennium Copyright Act (DMCA) seeks to prevent any individual from forging or removing a watermark, or from creating or publishing about hardware or software that is capable of doing so. New legislation now pending in the US Congress will, if it is passed, specifically penalise those who alter watermarks. Thus, you could not legally create a home recording on a player restricted to playing for example, only Disney titles or only titles for which a fee had been paid to the player's manufacturer or a consortium of recording companies.

Video steganography is more suited to avoiding piracy and is mostly used for digital watermarking. The owner's data is embedded either into the uncoded video or into the MPEG-2 bitstream and can be later retrieved from the decoded video. Although an existing MPEG-2 bitstream is partly altered, it does not visibly distort the original video information.

Many commercial graphics programs allow artistes to embed their names as well as copyright notices within images. Sometimes the concealed message may consist of a single bit that simply says "That's done by me!" This is sufficient to accomplish the desired purpose—a recording or playback device can detect this watermark and refuse to function, disabling access to the data if the user doesn't have the authorisation.

There are two types of digital watermarks—robust and fragile. A robust watermark is embedded in the file in such a way that even if the file is later transformed, the watermark will not be removed. A robust digital watermark is a concealed message that identifies the source of the data. It is called robust because it is designed to survive modifications to the data that result from resizing, cropping, or photographing an image to capture only the part of the image that doesn't have the watermark, or even from re-sampling or making an analog recording of an audio stream. Its application includes copyright protection, labelling, monitoring, tamper proofing and conditional access.

On the other hand, fragile digital watermarks are similar to fragile analog watermarks—if the data is altered or copied inexactly, the watermark is corrupted. If changes are made to a file containing a fragile digital watermark, the originator of the watermark will be able to detect and identify the areas where the alterations have been made and maybe even determine what the data was before modification. This scheme serves at proving the authenticity of the data.

For ensuring the integrity of data, digital signatures are preferred but fragile digital watermarking can detect data tampering without alerting the culprit. Compatible players refuse to play content that does not bear a valid watermark.

All part of one family

So how is steganography different from encryption? While cryptography protects the content of messages (their meaning), steganography conceals their very existence. In encryption, the reader can see

It's a Secret!

Plenty of free and shareware steganography software can be found on the Net. A list of such software can be obtained at <http://www.cotse.com/tools/stega.htm> or http://www.cl.cam.ac.uk/~fapp2/steganography/stego_soft.html. We are using a software called S-Tools 4 to hide one image within another. The receiver would need the same software to decode it and would also need to know the passphrase and the encryption algorithm.

STEP 1 Start S-Tools and Windows Explorer, using the latter as a drag-and-drop interface for the software.

STEP 2 Drag and drop the image to be used as the carrier file from the Explorer onto the Actions window in S-Tools.



The carrier file

STEP 3 Drag and drop the data file on the carrier file.



The data file to be hidden within the carrier file

STEP 4 You will be prompted to secure the process using a passphrase and an encryption algorithm. Convey these to the receiver too.



Securing the data file through encryption

STEP 5 The hidden data file is ready. Once the recipient receives it, he or she can just right-click on the file and choose Reveal. To extract it, right-click on the image and save it in the destination folder.



Extracting the hidden file

the data but cannot decode it if he does not know how to do so; if the reader knows how to decode the data, it isn't secure. In steganography, the reader isn't even aware that the data is being sent! It is often accepted that communications can be secured by encrypting the data, but this is not very reliable in practice. To ensure a high level of security, the ideal combination would be of encrypting the data and then sending it across using steganography.

Watermarking, as opposed to steganography, needs the additional protection against attempts by pirates at distorting/removing the watermark. In this context, the robustness depends on the application.



Copyright being the main area of watermarking, the data need not always be hidden, as some systems use visible digital watermarks. However, the media has mostly focused

Steganalysis

The art of detecting, decoding, erasing and altering messages hidden via steganography is called steganalysis. It is easiest when the before as well as the after steganography copies of the file are present. Steganalysis, can make the hidden data work against the creator. Any malicious interceptor could alter a carrier file without the knowledge of either the sender or the intended receiver. Hence, inaccurate or wrong data could be passed under the identity of the original sender.

Steganalysis tools are found aplenty on

the Net. One only needs to be aware of the carrier files; what follows is a three-step process—acquire, extract and destroy or modify. Stegdetect, for instance, is an automated tool for detecting steganographic content in images. It is capable of detecting several different steganographic methods that embed information in JPEG images. Currently, the detectable schemes are jsteg, jphide (Unix and Windows), Invisible Secrets, Outguess 1.3b, F5, AppendX and Camouflage.

on imperceptivity—invisible, inaudible digital watermarks that have wider applications.

Modern visible watermarks may be visual patterns such as a company logo or copyright sign overlaid on digital images. In most cases the information hidden using steganographic techniques is not related at all to the carrier file. These differences in goal lead to very different hiding techniques.

The final truth

Technology is a double-edged sword,

which can be used and misused depending on the user. Steganography is an example of this sword. It can be used for safeguarding data, such as in the field of media where copywriting ensures authenticity. On the flip side, many a terrorist and anti-humanist activities have been carried out cloaked under this technique.

While we may be able to put our trust in good faith and sense, predecessors of steganography, encryption and ciphering have proved that there is more harm than good to be done by it. ■

1/2 page Ad

REVEALING Windows

If you have wished for more control over who can access your PC or your data, the first solution would have been to switch over to Windows 2000 or XP. But you can have security in Windows 98 too

Every Windows user unwittingly leaves his or her PC naked to prying eyes. It doesn't take a programmer or cracker to get to your computer. Keys are left in every door and windows (no pun intended) are well oiled to make it simpler. Microsoft quietly assumed that 'desktop users' would never have the need for security and unabashedly discarded all such features from its 'home user operating systems', as against the server OSes.

This does not mean that we have to continue to pay for the oversight of the software giant. We can take our own steps to safeguard our PCs and data. Here are some of the most blatant security lapses and workarounds for the weaknesses.

Windows login

The Windows login is the worst pseudo security measure—by itself, it simply cannot prevent unauthorised access to your computer. Microsoft designed the

operating system for just desktop PCs, and assumed that security was required only for servers. Thus, the Windows login only loads the correct desktop settings and can be bypassed by simply pressing [Esc]. There are some ways to make it more secure, though these are not the most elegant solutions. Still, it will take more than just a little effort to bypass these.

First, configure your Windows for multiple users from *Control Panel > Users*. Create

a new user by typing a new name at the Windows login box, then restart Windows and login as the new user. Open the registry by running *regedit* from *Start > Run* and navigate to *HKEY_Users\Default\Software\Microsoft\Windows\CurrentVersion\Run*. If the *Run* key does not exist, create it. Create a new string value named *LockEscape*, and set its value to *rundll32 shell32,SHExitWindowsEx 0*. Now when you log off or restart the machine, you can login as the new user created, but if the *Cancel* button or the [Esc] key is pressed, the desktop will partially load and then return to the login screen. Optionally, you could set the PC to shut down upon unauthorised access, but this can get very irritating. To do this, use the command *rundll.exe user.exe,ExitWindows* as the value for the registry key.

This method basically takes advantage of the Windows architecture. When logging in as a particular user, Windows loads the user's profile with Desktop settings,



Set up multiple users on Windows



Access Denied 3.30, BootLocker 7.65, 1Click & Lock 2.4, Security Storm Desktop Lock 2002 for Windows 9x/Me, Cyber Patrol 5.0, Snitch 1.2

Find them on the Mindware CD

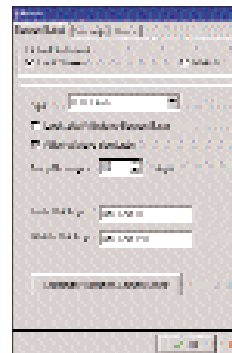
programs running at startup, etc. If no user logs in, it loads a default profile. To this default profile, we have added a command to log off at startup. Note that to create additional users, you will first need to delete this key from the registry.

This is sufficient to keep most people away from your computer, but if you want higher security, there are several third-party tools that provide excellent features. BootLocker (www.bootlocker.com) is one such utility that restricts access at various levels. You can use this as a login screen to Windows,

screensaver is to simply restart the system! Being executables, they are also vulnerable to viruses.

Workarounds for such vulnerabilities are simple—use more secure screensavers, after testing them thoroughly for all possible ways to kill it. Of course, you must also make a shortcut for it in the Startup folder otherwise someone can simply reboot your machine and disable the password. Couple this with a BIOS password and you have a fairly secure system.

For those who desperately want to get to your Windows, programs such as SSBy-pass (www.amecisco.com/ssbypass.htm) are readily available. It takes advantage of the Autorun facility for CDs, and kills the screensaver without having to provide the password. Unless you happen to interrupt the predator, you will never know that your system has been compromised. Thus, for



1Click & Lock is a good substitute for screensaver security

from a secure screensaver and Desktop lock. It can be launched at startup and runs in the system tray so that you can enable it when leaving your PC. It logs access and allows others to leave messages for you. Boot keys are disabled so that no one can access the PC from DOS or Safe Mode either. Also, the screensaver is optional—you may

// We have always been quite clear that Win95 and Win98 are not the systems to use if you are in a hostile security environment.

We

recommend Windows NT for those environments. *Paul Leach, a Microsoft representative, commenting on the security flaws of File and Print Sharing on Windows 9x*



or even when you leave your PC unattended for a while. It can even bring up a login screen for DOS. Access Denied (www.johnru.com) is a similar software that requests a username and password while booting. One great feature in this program is its ability to save short messages while the Desktop is locked. Thus, someone who wants to use your PC for a genuine purpose could leave a message for you to call him or her when you get to your PC.

Screensavers

Screensaver passwords are not as flawed as the Windows login—they are meant to protect an unattended Desktop from unauthorised access. However, these too are insecure because of their nature. Screensavers are simply executable programs. In fact, you can change the extension of any EXE file to SCR and load it as a screensaver! Thus, badly programmed or processor and RAM-intensive screensavers can often crash and give access to the Desktop. Amateur programmers can leave code that will allow simple key combinations such as [Alt] + [Tab], [Ctrl] + [Esc] and [Ctrl] + [Alt] + [Delete]. These problems plagued even the built-in screensavers on Windows 95 systems. The easiest way to bypass the

higher security, you will again have to fall back on third-party utilities such as Access Denied or Security Storm Desktop Lock 2002 (www.securitystorm.net). 1Click & Lock (www.softstack.com) is an interesting utility that combines all the functionality required

want to secure your desktop from access, but still view the programs running.

Network shares

Early users may remember that Windows was not originally intended to be used as a

Retrievable Passwords

Passwords on Windows systems are not safe. Any password you save within an application or anywhere within the system can be easily retrieved, or at least used on another PC. Some part of this will require good knowledge of Windows, for the rest, tools and utilities are readily available.

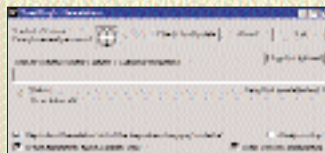
If you have the Auto-Complete feature for forms and passwords turned on in Internet Explorer, all this data is stored in the Windows Registry, under a single key. Anyone can simply export this key, transfer it to another machine and get access to your secure accounts on the Web. The data is not stored as plain text, but advanced users would even be able to decipher the passwords. You can turn off Auto-

Complete from **Control Panel > Internet Options > Content > AutoComplete**.

For applications such as e-mail and messenger clients, if you have saved the

account passwords in the application, they can be retrieved using software such as Revelation (www.snadboy.com). All one needs to do is point the cursor over the password field that displays asterisks to get the

actual password. Such software can be very useful when genuine users have forgotten their passwords, but the software does not distinguish between users—it will display the password to any user. For highest security, all passwords should be stored only in your head and nowhere else.



File Passwords

For several common file formats, there are tools available to extract forgotten passwords. Elcomsoft (www.elcomsoft.com) probably has the longest portfolio of such software, and their tools have proven to work in most cases. They have tools to recover passwords from Word, Excel, PowerPoint, Access, Outlook, Zip, RAR and many more file formats. All one needs to do is run the software, set a few password criteria, choose the file and let the software run. Using long and complicated passwords would make it quite difficult for the software to crack the password.

Archives such as Zip and RAR files have a very weird behaviour. If you set a pass-

word when creating the archive, the password is assigned to each file in the archive and not the archive itself. Thus, the file can be opened and the entire list of files can be seen. The files cannot be extracted without the password, but in many cases, viewing the file listing itself could be detrimental. One way to make them more secure is to compress files into an archive with a password, and then compress that archive into another one, again with a password. Thus, the only file that can be seen will be the original archive. Its contents will not be visible until a password is provided to extract it.



networked workstation. The first traces of network protocols, clients and services were thrown into Windows for Workgroups 3.11. Windows 95 had a much better network implementation, but the protocols used have gone through quite a few changes. Primitive protocols have been dropped and a handful of protocols such as TCP/IP and IPX/SPX have come up as winners by natural selection.

NetBIOS (Network Basic Input/Output

usually the first port hackers try to access—password-protecting your shares only make it slightly more difficult to get to your files. There are ample tools on the Net such as GFI LANguard Network Security Scanner (www.gfi.com) that can discover passwords in a matter of seconds.

Your computer is vulnerable even if you are not on a LAN and don't have any shared folders or printers, as long as the service is installed. The best solution would be to remove the File and Print Sharing service, if you are not going to be using these services. To do this, open *Control Panel* > *Network*, click *File and Print Sharing* and disable both the checkboxes. If *Client for Microsoft Networks* is installed, you will have to remove that too. You can then select *TCP/IP* and click *Properties* and check the *NetBIOS* tab to ensure that it has been disabled. Check the same for other protocols such as *IPX/SPX* and remove the *NetBEUI* protocol, which is just an extension of *NetBIOS*. However, you cannot do this if you are on a LAN and need to share resources. There is no real solution to prevent discovery of passwords on a LAN. User-level access is slightly stronger than share-level access, especially when logging in to a Windows NT or 2000 domain. Using long and complicated passwords also makes them difficult to figure out. However, if you want reliable security for your files, you should use some file encryption tools such as PGP (www.pgpi.org). (For more on encryption, data security and PGP, refer to *Datawatch in the November 2002 Digit issue*.)

Content Advisor

The parental control features added to Internet Explorer are a boon in many

households and organisations. Access to Web sites using Internet Explorer can be restricted to a great extent, based on various settings. In Internet Explorer 4 however, there were several bugs in this system that caused problems with the Content Advisor settings. The feature would enable or disable itself, forget the password and manifest other problems.

With each new problem that surfaced, Microsoft had to put up documentation on how to solve it. Most of the solutions gave detailed step-by-step instructions on how to disable the Content Advisor and reset its password, without requiring the current password. One such document at <http://support.microsoft.com/default.aspx?scid=kb;en-us;242037> lists virtually every version of Internet Explorer to be affected by the bug. These solutions also found their way to various support sites and message boards. Thus, it became quite simple to bypass this security.

In this case, the security feature is not



Snitch monitors Web activity for adult content in real time

inherently flawed, but ways to circumvent it are well documented. Thus, there is no workaround within Internet Explorer that will strengthen the security. If you want to restrict access to certain Web sites, you will have to use a third-party parental control software. Cyber Patrol (www.surfcontrol.com) filters out indecent or otherwise unwanted material on the Internet by controlling the user's Internet access and can also restrict the amount of time spent online. It updates the list of inappropriate sites daily and provides some powerful filtering options, giving you adequate control over each Internet session. Snitch (www.hyperdynesoftware.com), another Web-control software, works on a very interesting concept. It filters out content in real-time, by using several algorithms to detect adult content. It looks for words of a certain kind and analyses images to determine what per cent of them is showing skin, etc. It can even

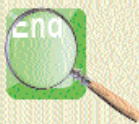


Configure network services and protocols

System) has been adopted as an industry standard to access LAN resources. Windows 98 uses a very primitive protocol, LAN Manager, which is quite weak on security. Microsoft implements NetBIOS over TCP/IP to share resources. The File and Print Sharing service primarily runs on port 139 and can easily give access to anyone on the network—LAN, or even the Internet. This is

Key Loggers

Key loggers are programs that run transparently on your computer and keep track of every single keystroke from your keyboard. These tools are freely available and can reveal everything you type, including passwords, to anyone who knows that such a program is running on your machine. Usually, these software also regularly send out the logs to the e-mail address of the person who installed it. Most anti-virus software are geared to trap and prevent key loggers.



bring up a list of suspicious files from your hard disk. Not surprisingly, there are also software such as PeaceFire (www.peacefire.org) available for free, that block out many popular parental control software.

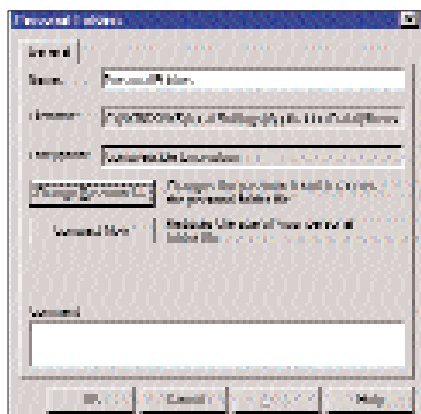
Outlook Express identities

Outlook Express has grown to be one of the most popular e-mail clients because of its integration with Internet Explorer, ease of use and features such as support for multiple identities. It is quite complete as a basic e-mail client, but security of e-mail is quite flawed. On the face of it, you can assign passwords to each identity so that each user can maintain his or her accounts, settings and e-mail. This feature has multiple flaws and working around it to access another person's e-mail is quite simple.

First of all, after a user logs in to an identity, it is necessary to log off, otherwise the client promptly opens up with the same identity. Simply closing the application is of no use. Secondly, if a person wants to access your e-mail, he or she can simply create a new identity and point his store

folder to the existing mailbox folder from *Tools > Options > Maintenance*. Another way to get to the mail is to copy off the mailbox files to another PC. Account settings are easily accessible for pranksters with a little knowledge of Windows, from the Windows Registry.

The identity feature works just like the Windows login—it acts as a profile login to load



Set a password for the mailbox file in Outlook

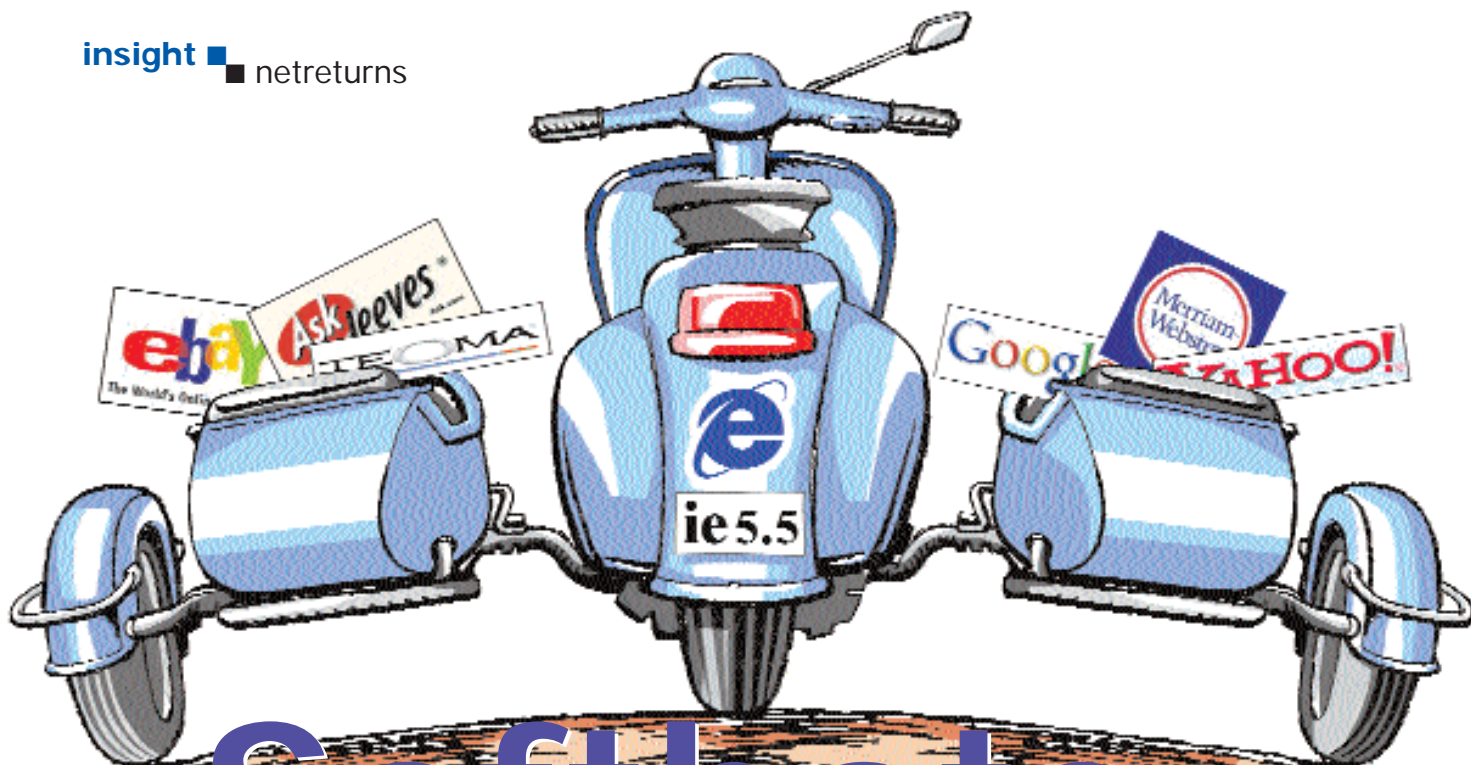
your settings and that's it. For e-mail security, you should switch to Outlook, which is bundled with MS Office. Here, the mailbox file itself is password-protected, so there is no easy way of accessing your messages. One would have to actually crack the code. Outlook will ask for a password every time it is opened, and the same password will be applicable even if the file is copied to another machine and loaded in a different Outlook. The password will be required even when importing messages from the mailbox. You can set the password from *Tools > Options > Mail Setup > Data Files > Settings*.

It is possible to overcome most security flaws in Windows systems. Though some of them are not the most elegant solutions, they will definitely keep most prying eyes away. Plus, they do save you big bucks in upgrading the operating system and the hardware to match it. Now you can sleep peacefully. ■

VEER KOTHARI

1/4 page H AD

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ILLUSTRATIONS: Mahesh Benkar

Softbots at your service

Fast, accurate and straight from within your browser—addons that will speed up your journey as you navigate through the vast and chaotic Net

In this age of technology, information is the key and time is always a constraint. Searching smart on the Internet isn't just a concept—it's an absolute necessity. The World Wide Web is a vast ocean of knowledge and a Net search is much like looking for the proverbial needle in a haystack. While most of us manage to just scratch the surface of the Internet, others maximise their precious online time with the help of power tools. These tools are freely available on the Net and operate from within the browser. They scrounge the Net using intelligent searches for what is relevant to your search and discard what is not, helping you work smarter and more efficiently. The tools listed here are must-haves, especially if you begin your online voyage by jumping into a search engine. Most of them are little browser add-ons that exist as toolbars within the browser. Some others are site-based tools that help you look for more specialised information. The browser add-

ons have been categorised into three types—those used for searching, those used for knowledge and reference searches, and those used for shopping. Of course, quite a few of these toolbars come close to doing all three, thereby saving you desktop real estate.

Seek and ye shall find

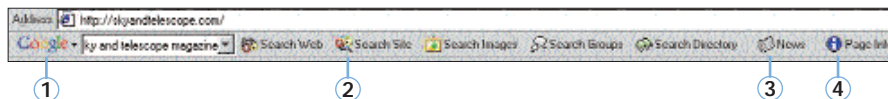
Fast and accurate—that's how we like our online searches. While you can log on to a search engine and have it locate what you want, few know that most of the popular search engines can be directly started from your browser. Seamlessly integrating into your existing browser, the search engines sit as tiny toolbars within your browser. They offer you the convenience of searching straight from your browser without first

having to locate the search engine on the Web—just enter the search criteria within the toolbar search box and start the search. There are several such tools available, with each famous search engine coming out with its own version.

The Google Toolbar

Web site: <http://toolbar.google.com>

Utter 'search' and most people will associate it with Google. The Google toolbar is free, accurate and has some slick features. Type in a query and access the results from Google's Web search or Image search, check out news groups from Google's Groups button or access the Directory search. This toolbar lets you open results in a separate page, so you can start searching, no matter what you are viewing cur-



Google the world: ① Configure the toolbar by clicking on Google. ② Use Search Site to search within the current Web page. ③ Access news from the News button. Page Rank (if enabled) shows you the popularity of the page. ④ The Page Info drop down list gives you a number of options such as to view cached snapshot of the page, view other similar pages, check out the backward links, and even have the page translated into English

AI RoboForm v5.0.2
Find it on the Mindware CD



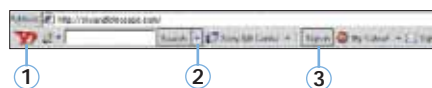
rently. Click on Page Info and access links to related pages, along with pages linking to the current site and translations into English from a variety of European languages. The Highlight highlights the search criteria across the current page.

It also has an enhanced version that has a feature called PageRank. This feature rates the popularity of your pages. Google warns you that if you use PageRank, it will collect information on your surfing habits. If you don't like this, take the non-enhanced version that has all the bells and whistles, except the aforementioned feature.

Ask Jeeves Toolbar

Web site: www.ask.com

Get the power of Jeeves, the Butler, on your browser toolbar. The Ask Jeeves Web site has been popular for being a child-friendly site and the toolbar continues that trend. It lets you pose search terms in simple natural language queries and



① Access the Yahoo! homepage by clicking on Y!. Edit and customise the toolbar by clicking here. The buttons reveal further links that let you jump straightaway onto your destination. ② For accessing the extra search options, click here and choose between dictionary and Thesaurus services, stock tickers, the address book, yellow pages, shopping facilities, news stories and picture galleries. ③ Sign into Yahoo! from here

to sign into Yahoo! and check out personalised news feeds and pages. You can also add oft-referred services such as news, finance, address books, jobs, directory listings and games. The buttons reveal the options within each section. E-mail alerts are linked to the toolbar and remind you to check your mail and provide a link to your account.

// We are drowning in information but starved of knowledge —John Naisbitt, author, talking about the future in his book *Megatrends*, 1982 **//**

comes with a whole host of options. You can also access Ask Jeeves for Kids for safe surfing for children, and check dictionary definitions and weather forecasts. The toolbar highlights every instance of the search term entered in the current page. The search results also include references to encyclopaedic sources.



Ask Jeeves: ① Configure the Butler on your toolbar by clicking on Ask Jeeves. ② The surf option for children is accessed here. ③ You can access the news and ④ the dictionary and definitions from here. ⑤ You can even choose to mail the current page to a friend

The Yahoo! Companion

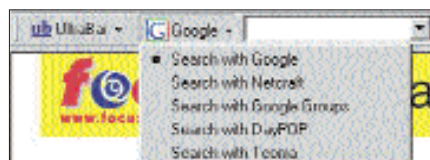
Web site: <http://companion.yahoo.com>

The Yahoo! Companion lets you access Yahoo!'s services quickly. Use the toolbar

The Ultrabar IE Toolbar

Web site: <http://ultrabar.com>

The Ultrabar IE toolbar comes with built-in support for many search engines such as Google, Alta Vista, Yahoo!, etc. The toolbar also supports searches within Google's groups, Yahoo's News and Stocks, News.com, the CGI Resource Index and the CPAN modules. It even lets you search across Tucows. The search is not restricted to these sites alone and can be customised to work with the search engines of your choice. You can appoint the order of the search engines and highlight all occurrences of the search terms within the page and go directly to the search terms or phrases. Unfortunately, metabrowsing across all of the listed engines, at the same time, is not possible.



① Click on Ultrabar and access the configuration options. ② Click here to change search engines. This displays the list of search engines. Set a customised search engine here. You can even highlight the search term across the results

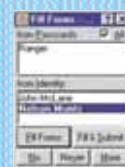
IDs, Online

Most Web-based services such as message boards and speciality sites require you to log on to access their services, slowly defining us by our online identities. This means we need to juggle our multiple online identities. So how do you remember the identities and passwords for each? Trust your online identities to a software designed for holding them.

AI RoboForm 5.0

Web site: www.roboform.com

This identity and password management addon holds all sorts of personal information—from names and addresses, to passwords and credit card information. Looking below the hood and tuning this software can be somewhat intimidating, but it becomes easy once you use it. It uses some pretty slick artificial intelligence routines to fill up any form you come across online. RoboForm Pro uses 3DES for security; however, the free 30-day trial version uses the less secure 1DES algorithm. The encrypted data is stored locally on the hard disk and not on any remote third party server.



AI RoboForm: ① Identities gives you access to the identities that you have created. ② Forms can be filled by a click of a button. ③ Personalise the toolbar under More. ④ This hides the toolbar, although it is still active. ⑤ Manage your passcards from here.

Teoma Search Bar

Web site: <http://sp.ask.com/docs/teoma/toolbar>

Teoma's Search Bar runs the new Teoma search engine that refines your searches to provide more accurate hits. It has two very useful features—Refine which offers suggestions to narrow down the search, and Resources which offers link collections to explore. Teoma also offers you a dictionary and definition feature that links up with Merriam-Webster OnLine. The highlighting button can be used to mark all the occurrences of the search term within the current page.

If reference be thy game

If you are a student who uses the Net for intensively researching specific topics, there are some excellent tools that let you



Teoma: ① Click here to fine tune the limited configuration options; choose which buttons you want displayed and set the other options. While you can't configure the Search options, it does yield some pretty useful resource sites. ② Highlighting is enabled from here. ③ To e-mail a copy of the page, click here

do it efficiently. News services, encyclopaedias and other authoritative reference works are available aplenty on the Net and you can also have them on your browser for immediate access.

Merriam-Webster Toolbar

Web site: www.m-w.com

Whether you are a writer or a reader, this toolbar is made for you. Just type in your subject and hit search, or highlight a term on a Web page and right-click to locate its meaning across the venerable Merriam-Webster OnLine. A pop-up window answers your question and gives you a link to an audio pronunciation of the word. This window also gives you relevant links and some historical information. You can use the dictionary as well as the associated Webster



Merriam-Webster: ① Click here to configure the toolbar. ② Enter the search term within the text window and to obtain a dictionary definition, ③ click on the Dictionary button. ④ Use the Thesaurus button for more information on the word. Both open up in a separate popup window, so your current page view remains intact. ⑤ The Word of the Day button opens a popup that gives you a word accompanied by some history

Thesaurus. While you could access quite a lot from the Webster portal online, you do not have access to the unabridged Webster online dictionary—this is a premium service. Incidentally, many search toolbars link up their dictionary and definition sections to Merriam-Webster.

MSNBC's News Alert

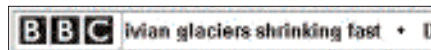
Web site: www.msnbc.com/tools/newstools/d/news_alert.asp

If you want to be up to date with the latest news, get hold of MSNBC's free news alert. This program adds an icon to your system tray and gives news alerts by flashing the icon. Clicking the icon opens up a popup window that gives you the headline and link to the complete story. Play with the settings to get it working to your liking and to set up personalised alerts for stories of your interest.

BBC News Ticker

Web site: <http://news.bbc.co.uk/hi/english/static/services/ticker/default.stm>

This one runs as a ticker on the top of your screen. You can configure the ticker to deliver the kind of news you would like to see. It continuously provides updated news headlines with a link to the complete stories at the BBC Web site.



BBC: Tune in for news, anytime

Bargains on the Web

Using some pretty sophisticated techniques, these little browser add-ons will rummage the Internet and get you just what you ordered for. But beware. When it comes to bargains that look too good to be true, they probably are. Use these tools and some common sense to bag some great bargains.

The Side Step Travel Search Engine

Web site: www.sidestep.com

Use this travel search engine to locate the lowest airline fares, hotel bookings and the lowest car rental costs all around the world. This metasearch travel engine combs all the low-cost travel sites to locate the best deals for you. It saves much of your planning time by searching and then comparing some 90 odd supplier sites such as Travelocity.com (www.travelocity.com), Expedia (www.expedia.com), Cheap Tickets (www.cheaptickets.com) and Lowestfare.com (www.lowestfare.com). It occupies a sidebar that sits on the left side of your page, so you can use it while you work. However, it is not the fastest search engine and restricts its search to starred hotels within India. This renders it useless to low-budget travellers.

The interface lets you choose between airlines, hotels and cars. You can flip through tabs and search for low airfares, cheaper hotel rates and car rentals.

Online, but not within your Browser

These are sites that have search services to locate information. Some of these sites offer specialised services, such as powerful metasearch tools. A 'metasearch' is similar to an ordinary search, with one major difference—metasearches query and scan across many search engines at the same time to locate information. These search engines are programmed to avoid duplicate listings. In some of them, you can use simple, natural language in the same way you communicate while speaking.

Generalised metasearch

If you are looking for vast metasearch engines that harness the power of several search technologies, check out MetaCrawler (www.metacrawler.com) and Mamma (www.mamma.com). Both organise the results into clusters by word, category or level of popularity, without duplicating list-



ings. Dogpile

(www.dogpile.com)

presents the results

sequentially. Also

notable is Invisible Web

(www.invisibleweb.com), a search engine that can ferret out information located within specific databases—other search engines find information on Web pages but fall short while searching for information embedded within databases.



Science-related research

If you are looking for reliable papers in any branch of study, you'll find them all using the Scirus search engine (www.scirus.com). Scirus scans across university Web sites and online paper repositories for your academic needs. Also check out Find Articles (www.findarticles.com), to locate magazine and journal articles.





SideStep: Search great bargains online!

- ① Click here to get great airfare bargains.
- ② Get affordable hotels here.
- ③ Click here for low-cost car rentals

The eBay Toolbar

Web site: http://pages.ebay.com/ebay_toolbar

This nifty toolbar keeps you updated



- ① The eBay button leads you to a whole lot of options—choose between signing in, checking out the community, browsing eBay Motors and Stores, Half.com (an eBay associate), Sotheby's and others.
- ② Click on the Search button and you will find a huge, well-sorted list. Click on any one category to open up a wide range of subcategories to further narrow down your search. Everything Else is for things you can't really classify.
- ③ Use the My eBay button to access personalised features.
- ④ The Bid Alert lets you set alerts for your bids,
- ⑤ while the Watch alert keeps track of an auction of your choice.

about the auctions at eBay.com (www.ebay.com). The toolbar has a wide range of subcategories in each drop down box, allowing you to make your search very specific. To bid, log into your eBay account and jump into the market. The toolbar lets you keep tabs on your selected auctions and keeps you updated by popup boxes with links to the auction when your selected auction is about to close. Similarly, your bids can also be monitored with the toolbar.

It's a big, bad Net out there but these high-quality, speed-enhancing tools get you around in a jiffy. You will find more such tools on the Net, but handle them with caution—they may be spyware. Always read the fine print before you sign up for any service to ensure that you don't trade your privacy for speed and ease. Steer away from tools that promote only specific third-party services, which will give you skewed results. So experiment and find the ones that suit you the best; use these quality browser addons to mine the Net efficiently and draw away from the tedium of researching for information.

SRINIVASAN RAMAKRISHNAN

1/2 page H Ad

30 Minutes Expert

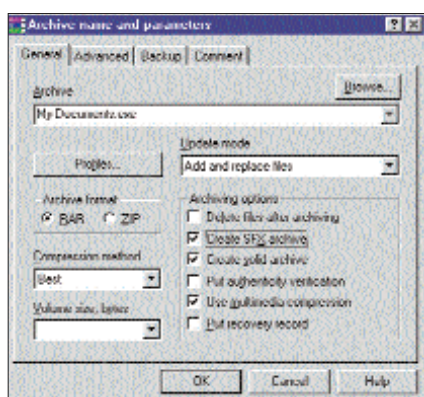
Self-extracting archives

The wide reach of computers to people of all ages and backgrounds has largely been affected by the user-friendliness of software. Yet, this factor is very subjective—it increases with exposure to the software and with tips from other users. In today's connected world, e-mail is the *de-facto* way of transferring files. Network administrators and long-time PC users still try and evangelise the use of FTP (File Transfer Protocol), but the apparent ease of e-mail is too good to let go. Most people have stopped urging others to use FTP, but they are still trying to share practices that will reduce the load on e-mail. One such advice is to compress the files you want to send by e-mail.

New users might be perplexed by the Winzip or PKZip interfaces—one can't extract a file by just right-clicking on it in an e-mail. WinRAR archives score over the Zip format by allowing you to add instructional guides, and the archives are also smaller. Also, this is a much more efficient way to distribute small programs instead of using commercial installers that make the installation unnecessarily large.

Compression

As with Winzip, you can right-click files in Windows Explorer to add them to RAR archives, but this will not give you access to options that optimise compression. If you are compressing very large or a sizeable number of files, you could gain



Compression options in WinRAR

a lot by changing the compression options. Select the files or folders you want to compress and click Add.

Set the compression method to Best and enable the Solid archive option. If you are compressing multimedia files such as uncompressed wave files (files compressed with multimedia codecs will not afford noticeable compression ratios) or images, enable Multimedia Compression. On the Advanced tab, choose the dictionary size. Generally, the higher the dictionary size, the greater the compression.

Self-extracting options

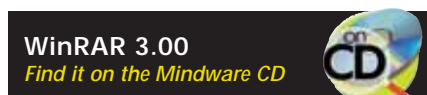
Creating a self-extracting archive when compressing with WinRAR is as simple as enabling the 'Create SFX archive' option on the General tab. However, this will create simple SFXs, that will be no better than those created over the Zip format. For added functionality, add script to the archive by writing commands in the Comments box. Type each command on a separate line. You can use any combinations of the commands, depending on your purpose for the archive.

Title=<title> sets the title of the extraction window. For example, **Title=Vacation Photos**.

Text=<message> displays a message in the extraction window when the EXE is double-clicked. You can repeat the command several times to display multiple lines of text. Use this to give a detailed description of the archive and instructions to the user.

Path=<path> sets the default path where the files will be extracted. You can enter the entire path including the drive letter, or specify a relative path. Relative paths are always extracted to the Program Files folder. For example, **Path=C:\My Documents\Vacation Photos**.

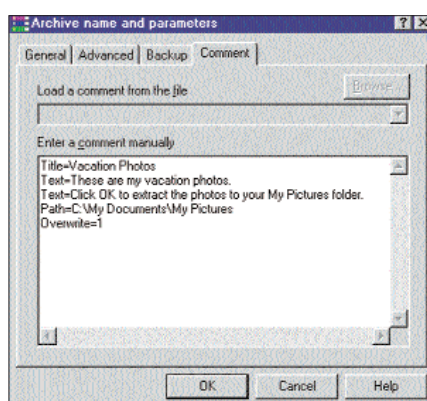
Silent extracts all files to the default path without providing any options and notifications to the user. If the Path command is not used, it will extract all files to



the current folder. Using this is not advised without the Setup command, as it makes usage less intuitive.

If **Overwrite=[0, 1, 2]** is set to 0, the user will be asked before overwriting the existing files. If it is set to 1 or no number is specified, all files will be overwritten without confirmation; if it is set to 2, all the existing files will not be overwritten.

Delete=<filename> deletes the specified file from the destination before extracting any files. You can use as many Delete commands as you want.



A sample script for sending your vacation snaps to your friends

Setup=<program> is a powerful option that can credit usability to your archives. The specified program will launch automatically after extraction is complete. Again, you can specify an absolute path or simply give the program name.

With **TempMode=[Question][@Title]**, the SFX will create a temporary folder, extract all files to it, start the program specified in the Setup command and remove the temporary folder with all its contents after completing the Setup program. This option is generally used to distribute programs. The optional Question and Title parameters can be used for the user to confirm installation.

VEER KOTHARI



Video errors, installation and upgrade problems, using Hindi fonts and much more—find your answers here

Internet telephony

Q I have a 1 GHz Celeron processor, a motherboard with integrated sound and graphics and Windows 98, with a modem. I use this system primarily for voice chatting with my husband. The problem is that he can hear what I'm saying but I can't hear him. Is this problem related to the soundcard or the telephone line?

Shamina

Via e-mail

A This problem could occur due to various reasons. Check if the headset is plugged into the correct port on your soundcard—it should be in the headphone-out port. Use the audio-tuning wizards that come bundled with the voice

chatting software to adjust the volume levels. For instance, in MSN and Yahoo! Messenger, these options are under the Tools and Help menus, respectively. An error in these wizards will let you know the cause of your problem. Finally, go to *Start > Settings > Control Panel > Multimedia*. Make sure that the name of the soundcard under the Playback and Recording sections is the right one. Also, check the box titled 'Use only preferred devices' and turn up the Master and Wave volumes in Volume Control by going to *Start > Programs > Accessories > Entertainment > Volume Control*. If you have amplified speakers, increase their volume as well.

Viral attack

Q I have Windows 98 SE installed on my PC. A few days back, I noticed two files, Folder.htt and Desktop.ini, recreated in every folder. I formatted the hard drive and recreated the partitions, but the problem persists. It causes an adverse effect on the system speed too. Apparently, the files are also infected with the VBS/Redlof@M virus. Which virus scanner can I use to remove it?

Vijay Tripathi

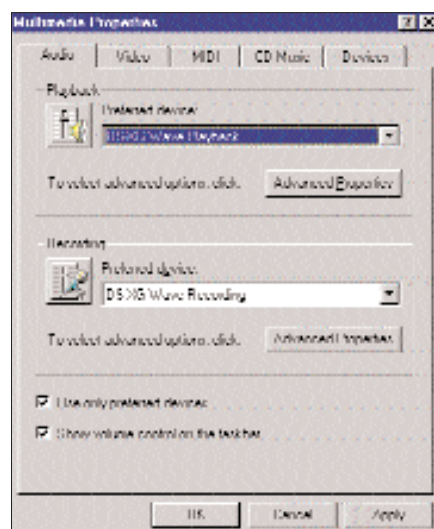
Via e-mail

A This is a polymorphic, encrypted, VBScript virus that infects HTML-based and VBScript files on all drives. The virus also copies itself to either the Kernel.dll or Kernel32.dll files and changes the default association for DLL files. It will then embed itself into every HTML e-mail

you send. You can use any good virus scanner such as Norton AntiVirus to look for infected files. Before this, you should modify the registry. Open the Registry Editor by running regedit from *Start > Run* and go to HKEY_Local_Machine\Software\Microsoft\Windows\CurrentVersion\Run. Delete the value Kernel32 under this. Next, browse to HKEY_Current_User\Identities\[User ID]\Software\Microsoft\Outlook Express\[Version]\Mail and delete the values Compose Use Stationery, Stationery Name and Wide Stationery Name. Under HKEY_Current_User\Software\Microsoft\Office\9.0\Outlook\Options\Mail, delete the EditorPreference value and finally, under HKEY_Classes_Root\dlFile, delete the keys Shell, ShellEx, ScriptEngine and ScriptHostEncode. Next, open *Start > Settings > Folder Options* and switch the view to Classic style instead of Web style. Restart the machine for the changes to take effect and run the virus scanner.

USB camera

Q I have a Pentium III system running Windows 98 SE. I have been using a Canon IXUS 300 digital camera for the past one year without any problems. However, now whenever I connect my camera to the computer using a USB cable, an error, 'STIMON caused an invalid page fault' is displayed. I have uninstalled and reinstalled all the software bundled with the camera. When I access Scanners from the Control Panel and select the camera in the window, an error



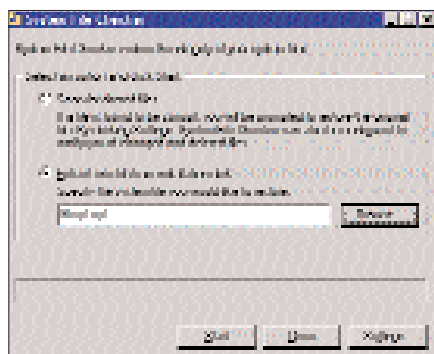
Select your soundcard as the preferred device

with Sticpl.cpl is displayed. Recently I had downloaded and installed the Windows 98 Q323255 Update. Could this have caused the problem?

Nitesh Kumar Jain

Via e-mail

A It seems that the Stimon.exe file on your PC is damaged. Press [Ctrl] + [Alt] + [Del] and check if Stimon is running. If it is, end the task. Delete the file from \Windows\System. Run the Registry Editor and navigate to HKEY_Local_Machine\Software\Microsoft\Windows\CurrentVersion. Look for a value named StillImageMonitor under either the Run or RunServices keys. Delete the value and restart the PC. Now reinstall the drivers for the USB camera.



Restoring a file using System File Checker

If you still get an error, replace the Sticpl.cpl file, too. To do this, run sfc from *Start* > *Run* and insert the Windows 98 installation disk. Select the option 'Extract one file from installation disk' and click Browse. Locate Sticpl.cpl in the \Windows\System folder and click Start. Restart the machine after restoring the file.

Bootable floppy

Q I made a bootable disk several times, using different floppies, but my PC doesn't boot from it. I can see the file list on the disk from DOS and Windows. What could be the problem?

Ashish

Via e-mail

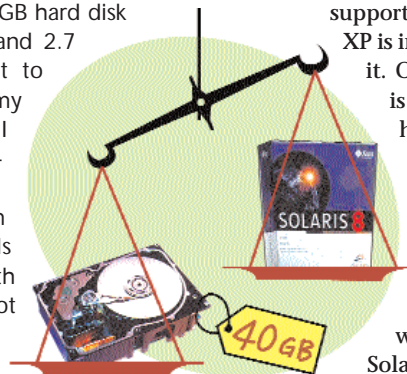
A Your PC is probably not set to boot from the floppy drive. This is a setting in the BIOS, where you can choose what device chain it should look through for booting. While the PC is booting, press the [Delete] key ([F2] on some BIOSes) to enter the BIOS setup. The way to access this option varies across different BIOSes, but just look for an option such as Boot

Installing Solaris

Q I have a Compaq Presario PC with Windows XP pre-installed on it. The partitions of my 40 GB hard disk are 37 GB (NTFS) and 2.7 GB (FAT32). I want to install Solaris 8 on my machine. When I boot the Solaris kernel, it gets terminated and the system gets restarted. Is there a problem with my BIOS, which is not allowing the kernel to run on it?

Gaurav

Via e-mail



ILLUSTRATIONS: Mahesh Benkar

A The installer is probably having some problems with the 40 GB hard

disk. The OS does not support disks beyond 32 GB, as documented on the Sun Web site. Your BIOS probably does support the drive, as Windows XP is installed and running on it. One workaround to this is to get another smaller hard disk and install Solaris on it, install the patches for Solaris that enable support for large disks, then reconnect the 40 GB drive. Another possible workaround is to install Solaris 8 on a smaller hard disk and then connect the 40 GB drive, but disable it in the BIOS. You could also try setting the drive to 32 GB in the BIOS and installing the operating system.

Order or First Boot Device. Ensure that A or Floppy is set as the first boot device, save the changes and exit the BIOS. Henceforth, it should boot from the floppy. If it still doesn't, the problem could be with the floppy drive itself, in which case you will have to get it replaced.

Running old programs

Q I need to run a DOS accounting software under Windows Me, but I have to change the Files variable to 100, which by default is 10. In Windows 98, I used to set it from the config.sys file, but in Windows Me I cannot edit it. How can this be done?

Rahil Mehta

Via e-mail

A You can set the environment variable from the autoexec.bat file instead of the config.sys file. Use the DOS command SET to assign a value to a variable. Thus, you can enter the following line in the autoexec.bat file, or type it directly at the Command Prompt:

SET FILES=100

To remove an environment variable, type the SET command without any value (SET FILES=) and simply type SET to view a list of current variables.

Receipt confirmation

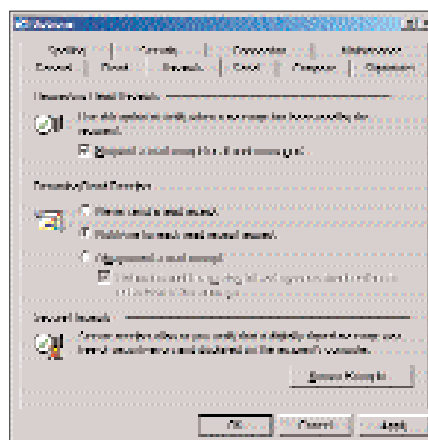
Q I have a Pentium II 433 MHz system with 128 MB RAM running Windows 98 SE. I have Outlook Express 6 installed as my e-mail client. How can I confirm that the person to whom the mail has been

sent has seen the message?

Sukhbir

Via e-mail

A You can request a notification when the recipient reads the message using the Request Read Receipt option in Outlook Express. When creating a message, click *Tools* > *Request Read Receipt* to enable this for the message. A better option would be to enable this permanently, so that the request goes with every message you send. To do this, open *Tools* > *Options* > *Receipts* and enable 'Request a read receipt for all sent messages'. Here, you will also notice how Outlook Express should respond to receipt requests it gets from other senders. When the recipient first opens your message or views it in the Preview Pane,



Enable Read Receipt requests in Outlook Express

XP Service Pack

Q I have a Pentium III 1.14 GHz processor and 128 MB SDRAM. I tried installing Windows XP Service Pack 1 from the November Mindware CD. After it copied all the files, it gave a message that the CD key is not valid. If the key was not valid then Windows XP would not have installed in the first place. Why am I getting this error?

Meetesh Jain

Via e-mail

A Since the release of Windows XP, Microsoft noticed that the vast majority of illegitimate copies are using a small handful of leaked CD keys. In an effort to thwart these illegitimate users, Windows XP Service Pack 1 will not install on systems using these keys. Microsoft claims that legitimate licensed users of



XP Professional should be unaffected.

During the installation of Windows XP Professional, you are prompted to enter a 25 digit Windows XP Product Key, which XP uses to generate the system's product ID. Because of security concerns about piracy, Microsoft does not provide a tool that allows you to view the Product Key that was used to install the operating system. The Product ID can be found by right-clicking My Computer and choosing Properties. To determine eligibility for the update, Service Pack 1 compares the Product ID on the system against the list. Service Pack 1 for Windows XP will fail to install if either the XXXXX-640-0000356-23XXX or the XXXXX-640-2001765-23XXX range of Product IDs is found on your system.

Outlook Express will either send back a message saying that the e-mail has been read, or ask the user for confirmation to do so, depending on the settings. It may also be set to never send such notifications. Thus, it is possible for the recipient to not send you the receipt notification.

Autorun

Q How can I create an Autorun CD?

Prabhat

Via e-mail

A To create an Autorun CD, simply place a text file named autorun.inf in the root. The contents of this text file can have a lot of property and behaviour-defining parameters, but the ones you will use most are the following:

`open=<program path and name>`

`icon=<icon path and name>`

Each parameter must appear on a separate line. Also, ideally the path should be relative, since the CD-ROM drive letter would differ from PC to PC. Thus, if you want to launch a program named runcd.exe from the Autorun folder on a CD, the text would be `open=autorun\runcd.exe`.

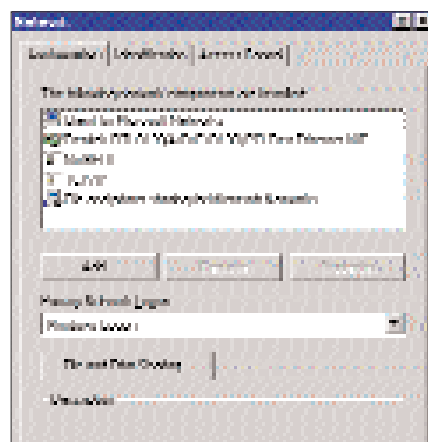
Cross cabling

Q I have an IBM NetVista with a D-Link Lan card installed. Recently I purchased a

Pentium 4 system with a Compex RE100ATX/WOL Lan card. I connected them with a cross-criped cable and after logging on, the IBM node was available in Network Neighborhood of the Pentium 4 system. When I tried accessing it, it displayed a message that the node was not accessible and the IBM system does not show Pentium 4 at all. On connecting the two via a hub on an existing network, both machines can access other systems on the network, but not each other. Please help.

Pathanjali Nadiminty

Via e-mail



Add, remove and configure protocols and services on Windows 9x

A You have not mentioned what operating systems each machine is running. The problem can occur due to incompatibility of network protocols across the machines, or simply some network settings. Ensure that the same set of protocols and services are installed on both systems and they should be able to communicate with each other. Also, if you are using only TCP/IP on both machines, make sure they both have valid IP addresses in the same subnet. You can configure all network settings by right-clicking Network Neighborhood and clicking Properties. Most importantly, ensure that File and Print Sharing is enabled on both computers.

Hindi on the Web

Q I would like to put a Word document containing Hindi script on the Internet. The document has been created on Windows 98 using Word 97, using Akruti fonts. The fonts have been embedded into the document and I tested it on several computers where Hindi fonts are not installed. The document opened properly, so I sent it to London, where the Web site is being maintained. The feedback from there is that they cannot see Hindi script as the font is not available. What could be the reason for this? Are there any limitations in embedding true type fonts in Word?

Prasad DVR

Via e-mail

A It is possible that the document is being viewed within Internet Explorer at the other end. Thus, the embedded fonts may not show. Also, it is possible that the document is being viewed on a different version of Microsoft Word, which may be handling the file differently. Create different versions of the document on different versions of Word and see if they open properly. Word 2000 and higher have stricter licensing policies when embedding fonts than Word 97, so this could cause the problem.

Startup screen

Q I'm facing a curious problem. Normally when Windows boots, it shows the graphical bootup screen of the Windows version. I have Windows 98 SE on my machine. For the last three months, my bootup screen has changed to that of Windows Memphis. I don't know how it got changed. I looked for the logos.sys and logow.sys files, but these are intact. The screen had changed after I installed some software. I have

FAQs

TV tuner problems

Q. I have a Mercury TV tuner card. TV programs are captured with quite poor quality while recording in VCD mode. Changing the resolution has not helped. Can I directly save the video capture in DivX/MPEG4 format? I can't afford to record raw video as I have only 7 GB of free space.

Anoop

Via e-mail

A. The quality at which you can capture video is largely dependent on the TV tuner card—cheap, low-end cards can never match the quality of a dedicated video capture card. The quality that you get is probably a limitation of your hardware. Try checking the driver configuration of your card to see if it offers a high-quality mode. You can do this by referring to the manual or the manufacturer's Web site (www.kobian.com). Capturing to DivX formats is very processor-intensive and requires a high-end CPU. You can download the latest DivX bundle from <http://www.divx.com/divx/>. After doing so, you can choose to encode into DivX from your TV tuner card's video capture settings—if your processor has the necessary power, you will be able to get good video encoding.

If your processor is not up to it, try using other codecs such as Intel Indeo 5.x or Radius Cinepak. These are not very heavy on the system and do not cut away too much visible clarity. Do note that encoding has very little to do with the video quality of live feeds. The codec only compresses the incoming video feed and further quality loss due to encoding is usually marginal (depending on the codec settings). The only other way encoding affects quality is if frame-drops occur due to slow processors. Thus, if you notice that the video feed itself is good quality and only the recording is poor, check the codec settings—changes such as using a different codec (keep away from the CPU-intensive ones), reducing the amount of compression and using more keyframes can tremendously improve quality. For better video quality, the best option would be to record video at higher resolutions, but you may have to upgrade the TV tuner card for that.

No picture

Q. I have a Compaq Presario 7500 running Windows XP Professional. It has 192 MB of RAM and a Compaq DVD/CD-ROM SD-612B. I use Windows Media Player version 9, but am not able to see movies on it—I can hear the sound, but there is no picture. Please help.

Ankush

Via e-mail

A. The problem is with either the player itself, or the video codecs. This problem has been documented in earlier versions of Windows Media Player. Version 6.4 has been the most stable player till date, but most bugs seem to have been fixed in version 9. Also, until now only Release Candidates for the new version have been made available, which means it tends to have bugs. The final release will have at least the most apparent bugs fixed. You can download and install the earlier version from www.microsoft.com/windows/windowsmedia/download/default.asp and try watching the movies.

It would be difficult to determine whether it's a codec problem, since you have not mentioned what kind of movies you are trying to view—whether they are MPEG or AVI files, VCDs, or other formats. DivX videos that you download off the Internet could pose problems. There are several flavours of the codec such as SMR, FlaskMPEG, Microcrap, etc and if the videos are encoded with any of these, you would need to have the relevant codec installed. Since these codecs are very similar at the core, the player may open the file anyway and not display any picture. If the codecs seem to be the problem, try downloading and installing the Codec Pack of ELISOFT from <http://codecpack.elisoft.net/>.

Another problem, though unlikely, could be with the video files themselves if they are DivX files. Some video files get corrupted during transfers or encoding software add unnecessary headers. Open the file using VirtualDub (www.virtualdub.org) and save it as a different file using the Direct Stream Copy option for video and audio. This will cut out unnecessary bytes from the file that the player may not understand.

uninstalled it, but the screen has not changed back. Is there a way to solve this problem other than reinstalling Windows?

Abhradeep Biswas

Via e-mail


A. The startup screen is not loaded from the logo.sys or logow.sys files. If the logo.sys file exists, it is used for the startup screen, otherwise the default system screen is used. Thus, to revert back to the original display, simply locate and delete the logo.sys file. This could be in the root of drive C or in the Windows folder.

Noisy drives

Q. When I start my PC, the floppy drive makes some noise and after entering the BIOS password, it again makes some noise. After the operating system is loaded, when I start any application, my hard disk also starts making some noise. Please help me reduce these noises. I scan and defragment the hard disk regularly.

Kamalshil Lokhande

Via e-mail

A. On starting the PC, after POST and after entering the BIOS password, the BIOS may be looking up the floppy drive to check if a bootable disk is inserted, causing the noise. You can disable this option from the BIOS and have it boot directly from the hard disk instead (see *question, Bootable floppy*). Also disable 'Boot Up Floppy Seek' from the BIOS. When you start applications, Windows would be transferring a lot of data to the hard disk to use the swap file. There is not much you can do about this. The hard disk will make noise every time there is heavy disk activity. Setting a permanent swap file after defragmenting the hard disk once may help, but will not reduce the noise much. If you have Windows 9x, to set a permanent swap file open *Control Panel > System > Performance > Virtual Memory*. Enable 'Let me specify my own virtual memory settings' and set the same value for the minimum and maximum swap file size. Ideally, this value should be two-and-a-half times the amount of RAM you have on the PC. Thus, if you have 64 MB of RAM, set this value to 160. 



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D-222/2, Om Sagar, MIDC, Nerul-400 706, and we may answer it here!

tips & tricks

Power Windows

Secrets to attaining peace of mind when working with Windows—here's everything you need to know to run a lean, mean, killer machine

1

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- 5 Windows 2000 Professional
- 7 Windows XP Professional



Tweak UI for Windows 98 and 2000,
Tweak UI for XP
Tips on becoming a Photoshop Guru
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This most widely used OS is more tolerant than later versions and allows many power

Turn off Task Scheduler

First of all, turn off the Task Scheduler, unless it really is scheduling something important. Most users have no critical programs scheduled, especially after freshly installing Windows. The scheduling utility keeps running in the background, unnecessarily hogging memory. To disable it, double-click the Task Scheduler icon in the system tray and click *Advanced > Stop Using Task Scheduler*. When you create a scheduled task, the feature will be enabled.

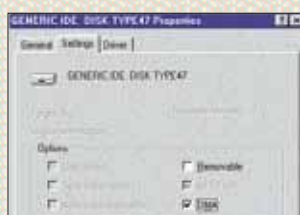
Nix the Active Desktop

For a healthy Windows, you have to get rid of the Active Desktop. Microsoft had added this feature with Internet Explorer 4 and later into Windows when it integrated the browser and the operating system. It allows you to display Web content on the desktop itself. The Active Desktop hogs a ridiculous amount of memory and often causes the system to be unstable. Simply right-click on an empty area of the desktop and disable View as Web Page to turn this off. If you set JPEG or GIF files as your wallpaper, this feature needs to be turned on. It is better to convert them to BMPs before setting them as the wallpaper.

Enable DMA

Direct Memory Access (DMA) is a technique that hard disks and CD-ROM drives can use to transfer data directly to and from memory, without passing through the processor. DMA reduces the load on the system processor since data transfers do not require monitoring by the CPU. With DMA, a write or read operation can be executed in two to four clock cycles. Without DMA it will cost the CPU a minimum of 16 clock cycles per operation. Not only do disk read/write operations gain a significant boost in speed, but Windows also works faster, since it can load system files much faster and also accesses the swap file at higher speeds.

Older hard disks and CD-ROM drives do not support DMA, but almost all computers today use DMA-compliant devices. In case you face a problem after enabling DMA, reboot Windows to Safe Mode and disable the option. Also, DMA needs to be enabled from the BIOS.



Enabling DMA significantly improves speed

but again, on most computers, this is on by default. DMA is supported only in Windows 95 OSR 2 and later.

To enable DMA, open *Control Panel > System > Device Manager*. Expand the Disk drives tree, select the hard disk and click Properties. Under the Settings tab, check the DMA option. Repeat this for all other hard disks and the CD-ROM or DVD-ROM drives.

File system properties

Changing the File System settings can also provide better performance. First, change your computer's role to a Network Server, even if it is not one. Open *Control Panel > System > Performance* and click File System. Under the Hard Disk tab, change the typical role of the computer to Network server instead of Desktop computer. The setting controls the size of various internal data structures used by the 32-bit file access driver (VFAT). When you use the Desktop computer setting, VFAT allocates memory to record the 32 most recently accessed folders and 677 most recently accessed files, consuming approximately 10 KB of memory. With the Mobile or docking system setting, VFAT allocates memory to record 16 folders and 337 files, taking up around 5 KB of memory. As a Network server, VFAT allocates around 40 KB of memory to record 64 folders and 2,729 files. With the kind of memory available on sys-

tems today, this slight overhead hardly makes any difference, especially considering the performance gain it provides.

Optimise virtual memory

The way virtual memory is configured tremendously affects Windows performance. This is true for all versions of Windows, including the now-obsolete Windows 3.1. The swap file is what Windows uses to store temporary data when it runs out of RAM. Thus, your working is not limited by the amount of RAM on your machine. However, for a program to be able to use this data, it must be transferred back to the RAM. The data that is not immediately required is moved to a part of the hard disk and recalled when required. However, since hard disks are nowhere as fast as RAM, swapping data back and forth drastically reduces speed. No matter how much RAM you have, Windows will always use the swap file for some infrequently used parts of the OS (*read the next tip to see how to avoid this*).

By default, Windows



Optimise the Windows swap file for better performance

Defragmenting

Regularly defragmenting the hard disk maintains optimum performance for read/write operations. Hard disks store data in sectors and clusters, the latter being the smallest addressable unit. Clusters are of a fixed size, depending on the file system (FAT, FAT32, NTFS, etc.). A cluster can hold only one file, but a file may span over several clusters. For FAT32 partitions, the cluster size is 4 KB. Thus, any file between 0 bytes to 4 KB will occupy one cluster. Should its size increase beyond 4 KB, it will look for the next free cluster to fill up. With frequently changing

files such as documents, spreadsheets, images, etc., the fragments of the file may not be on contiguous clusters. Reading and writing to such files spread all over the partition is obviously slow. Defragmenting brings pieces of the file together, so that they are accessed faster.

All versions of Windows are bundled with defragmenting tools. In Windows 98, you can run it from **Start > Programs > Accessories > System Tools > Disk Defragmenter**. In Windows 2000 and XP, right-click My Computer and click Manage. Look for Disk Defragmenter under Storage.

uses a variable swap file that is created on bootup and where the size is dynamically modified when required. Though this works just fine, it is not the most optimal. You can never get the speed of RAM from the hard disk, but you can make it slightly faster. The best way to configure the swap file is to have a permanent swap file, preferably on a dedicated partition. This minimises the effect of disk fragmentation and increases seek time. Another practice that a few power users have adopted is to place the swap file on the first partition and the operating system on the following partition. Data closer to the centre of the drive is read slightly faster than data at the periphery. This is especially useful for PCs with only

64 or 128 MB of RAM where data would frequently be swapped to the hard disk and can be easily done with BIOSes that allow booting from the D drive.

To change the swap file settings, open **Control Panel > System > Performance** and click Virtual Memory. Choose 'Let me specify my own virtual memory settings' and select the drive for the swap file. Note that no matter what partition you boot from, it will always appear as the C drive from DOS and Windows 98, and the first partition that is recognised as C by the BIOS will be assigned a higher drive letter. Set the minimum and maximum size for the swap file. Both these numbers should be identical to set a permanent

(non-variable) swap file. Ideally, it should be two-and-a-half times the amount of RAM on your system, but if you have a separate partition for it, you may not want it to be less than 512 MB—if it is lower, it will have to be a FAT16 partition, not FAT32.

Avoid the swap file

When Windows loads, it moves certain parts of the operating system to the swap file anyway, regardless of whether it has run out of RAM or not. This is very good for systems with less memory, since it leaves some free RAM and applications will start much faster. Otherwise, when you start an application and memory is required, Windows will have to first move all this data to the swap file to free up RAM. This functionality is usually not required on systems with 256 MB or more RAM, especially if they only run common productivity tools such as Office and Internet applications. You can prevent Windows from using the swap file until absolutely required by adding the line below to the [386Enh] section of the \Windows\system.ini file.

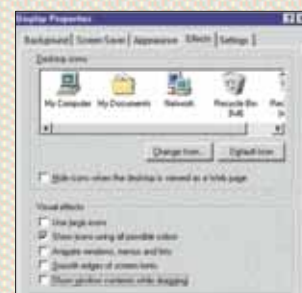
*ConservativeSwapfile
Usage=1*

You can edit this file in Notepad. In case you face any problems such as programs crashing frequently, remove this line and reboot.

Display settings

The display settings affect the speed of Windows too. The more animations and transi-

tions the OS has to show, the higher is the processor and RAM usage. Typically, turning off all such features instantaneously shows the difference in speed. Right-click an empty area of the desktop and click Properties. Under the Effects tab, uncheck the boxes for 'Animate windows, menus and lists', 'Smooth



Turn off unnecessary graphic effects

edges of screen fonts' and 'Show window contents while dragging'.

Temporary cleaner

Regularly removing files that accumulate in the Temp folder can also show better performance—these files are usually very small and unnecessarily fill up the hard disk. This also causes high disk fragmentation and pushes important data towards the periphery of the disk, where read/write operations are slower. Ideally, create a batch file that empties this folder and place it in the Startup, so that it runs every time you boot to Windows. You could do this from the autoexec.bat too, but this file runs while still in DOS mode, so disk access will be much

3



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slower than when in Windows. You should strip all file attributes before running the delete command, since hidden and system files will not be deleted from the Command Prompt. Also, using the *deltree* command instead of *del* will ensure that even folders are deleted. Thus, your batch file should contain the following commands:

```
attrib -a -s -r -h c:\Windows\Temp\*.* /s
Deltree /y C:\Windows\Temp\*
```

Managing power

Power Management is a very useful feature for notebooks, but not as critical on a desktop PC. With default power management settings, the computer will automatically reduce the spinning rate of the hard disks and blank off the monitor after a few minutes of idle time. In older systems, this sometimes causes Windows to lock up. Depending on the settings, every time you need to use the PC, the hard disk will have to spin up again before data can be accessed on it. Turning off power management completely will not harm the system in any way. At most,

set only the monitor to be turned off. Open *Control Panel > Power Management* and choose *Always On* under Power schemes to disable all power saving features. Optionally, you can set only the system standby and hard disk settings to *Never*.

Disable Autorun

Autorun was an innovative feature to automatically launch programs from CD-ROM and DVD drives. However, the way it works, it affects system performance, apart from being irritating at times. While this feature is on, Windows polls the drive every 5 seconds to check if some media has been inserted. If it finds a new disc, it will check it for the autorun.inf file and execute the commands within this. This is quite an overhead, especially when you need the feature only sometimes. This is true for all versions of Windows. To turn it off, open *Control Panel > System > Device Manager*. Expand the CDROM tree, select the drive and click Properties. Under the Settings tab, disable 'Auto insert notification'.

Boot faster

Before Windows loads, it processes certain files to set the correct environment and load initial drivers and Windows settings. The config.sys typically loads drivers and the autoexec.bat sets the environment and runs programs before Windows loads. If these files are loading any unnecessary items, you

BIOS Tweaks

Changing certain BIOS settings can reduce the amount of time it takes to hand over control to the operating system, thereby reducing the time taken to boot. Although there are several different BIOSes with varying options, there are some settings common to all. Look around your BIOS to find these options. Usually, to enter the BIOS setup, you have to press the [Delete] key while it is loading.

Configure your hard drives in the BIOS, instead of setting it to automatically detect them every time it boots. For most

BIOSes, you can simply select the Auto Detect Hard Disks option. Disable Boot Up Floppy Seek. This option checks if there is a floppy in the drive. You also don't need the Virus Protection feature. Enabling this from the BIOS often causes problems with system updates and also slows down the booting time. Change the boot order so that it loads the operating system from the hard drive first. You would hardly ever boot from a floppy or CD-ROM and when you need to, you can switch to this configuration in the BIOS.

should remove them. Both files can be edited in Notepad.

A third file, the msdos.sys, sets several parameters for Windows. It specifies the Windows folder, the location of the startup files, behaviour of the boot menu, etc. Changing a few parameters can ensure faster booting of the operating system. If any parameters exist, you can change its value, or simply add a line with the parameter. Before you can edit this file, however, you must strip its read-only and hidden attributes. To do this, open a Command Prompt window and type this command:

```
attrib -h -r msdos.sys
```

When Windows is not shut down properly, it automatically runs Scandisk when it boots again. You can disable this by using AutoScan=0. Setting its value

to 1 will bring up a prompt asking if you want to run Scandisk and setting it to 2 will run Scandisk automatically. *BootDelay=x* sets the amount of time you have to press [F8] to bring up the boot menu. The default value for this is 2 seconds. If BootMenu is set to 1, it will always bring up the boot menu, *BootMenuDelay* sets the number of seconds this menu is displayed for, before booting with the default selection. When BootWarn is set to 0, Windows will boot to Safe Mode without warning, whenever it does not start properly.

By now, you probably have FAT32 on all drives, so disk compression utilities will not work. You should disable the driver for this by setting DblSpace and DrvSpace to 0. Also, if you do not have a SCSI controller, set

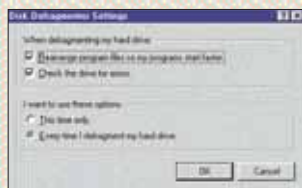


Turn off power saving features

DoubleBuffer to 0. You can disable logging of the boot process by setting the value of DisableLog to 1. Setting SystemReg to 0 will disable scanning of the Registry at startup, but it is better to leave this on.

Defragmenting to rearrange programs

Windows 98 has a pretty useful feature to help load applications faster—over time, it tracks your usage patterns and logs the frequency with which you use each application. It can then rearrange the files of the application on your hard drive so that they will load faster. After you have used your computer for a few weeks, run the Disk Defragmenter and select the drive you want to defragment (usually C). Click Set-

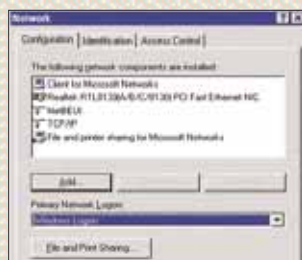


Defragment the hard disk to rearrange programs

tings and check the box to 'Rearrange program files so my programs start faster'. Plus, you also have the added advantage of the disk getting defragmented.

Windows logon

If you are not on a network and Windows is not configured for multiple users, or network users are not authenticated by an NT domain, you should turn off the Windows logon dialog



Log on to Windows automatically

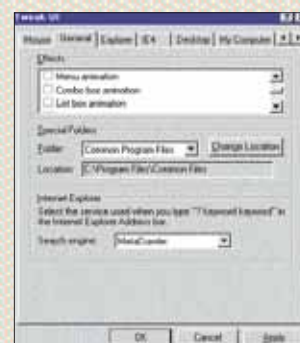
box. Open **Control Panel > Network** to configure the network properties. You don't require the Microsoft Family Logon, so select it and click Remove. Ensure that the Primary Network Logon is Windows Logon and click OK. If you don't have any password for the user, Windows will automatically log on without the prompt. If you did set a password, you can locate and delete the PWL file from the Windows folder, restart Windows and this time enter a blank password.

Using Tweak UI

Tweak UI is a very powerful software that lets you change various system settings without having to edit system files or fiddle with the Registry. It is free and can be downloaded from www.microsoft.com/networkstation/downloads/PowerToys/Networking/NTTweakUI.asp. Version 1.33 is a consolidated version that will work on Windows 9x as well as NT systems—it will give you different options on different OSes. After it is installed, it will be available from the Control Panel. Using Tweak UI is pretty straightforward, but here are

a few changes you must make to get better performance.

Under the General tab, disable Window animation, Smooth scrolling, Menu animation, Combo box animation and List box animation. On the Explorer tab, disable 'Animated Click here to begin'. Next, switch to the IE4 tab and disable 'Active Desktop enabled'. On the Boot tab, you can control boot settings such as the behaviour of the boot menu, Scandisk, etc. Autorun for



Use Tweak UI to speed up Windows 98

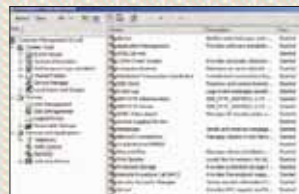
be disabled under the Paranoia tab.

WINDOWS 2000 PROFESSIONAL

Windows 2000 lacks little in terms of performance and stability, but can be squeezed for even more juice

Get rid of services

Services are background applications that run on Windows. They may be system-related programs without which Windows cannot run, or helper applications, providing certain functionality to other programs. For example, the Security Accounts Manager service stores security information for user accounts to be used by all applications for authentication. Windows 2000 starts several services by default, many of which you may not require. You can either permanently disable a service, or set it to be manual-



Stop services you don't require

ly started. If you are unsure, choose the Manual mode—the service will be started only when required, but will not cause any errors. If permanently disabled, dependent programs will throw up errors when they need the service.

Right-click My Computer and click Manage. On the left pane, expand Services and Applications and click Services. Sort the services in descending order by the Status column to bring the services that are currently running on top. You can select each service and double-click it to read its description, change the Startup type to Manual or Disabled and to stop it. As you go through the list, you may realise that you don't require more than half the services, such as Distributed File System, Task Scheduler, Remote Registry Service,

RunAs Service, etc. If you don't have any NTFS partitions, Distributed Link Tracking will not help in any way. Similarly, if you don't have any printers installed, you can turn off Print Spooler.

Personalised menus

Windows 2000 introduced personalised menus, tracking usage of menu items across all local users. Items that have not been used recently are hidden away, providing faster access to frequently used shortcuts. This is a very resourceful addition to the user interface, but comes at a price. Every time you open a menu, Windows checks up which items are to be displayed and which ones are to



Disable personalised menus in Windows 2000

be hidden. This is quite unnecessary and one can actually feel the delay on slow systems. Turn off personalised menus from **Start > Settings > Taskbar & Start Menu**.

Active Desktop

Though there haven't been any known issues with Active Desktop on Windows 2000 as against 98, it can slow down



Web content on the desktop hogs resources

the OS. You should avoid using GIFs and JPEG images as your wallpaper. To disable Web content on the desktop, right-click on the desktop, click Properties and switch to the Web tab. Uncheck the box to 'Show Web content on my Active Desktop' and click OK.

Away with display effects

Windows 2000 brought with it a new set of display effects for menus, lists and windows. Turning these off will save up some resources. The performance gain will be more apparent on low-end computers, but you will definitely notice it when minimising or maximising windows. Right-click on the desktop, click Properties and switch to the Effects tab.

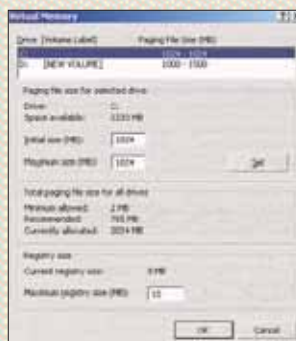


Squeeze out even the last drop of power by turning off display effects

Disable 'Use transition effects for menus and tooltips', 'Smooth edges of screen fonts' and 'Show window contents while dragging'.

Performance options

Built over the NT architecture, Windows 2000 provides performance options similar to Windows NT 4. Open **Control Panel > System > Advanced** and click Performance Options. Here, you can set Windows to optimise processor and memory usage for



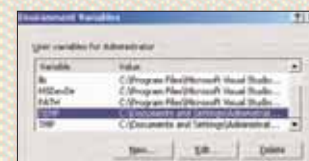
Setting the swap file sizes and the maximum registry size

applications or background services. For desktop PCs, you don't need to change this setting. If it were a server, you would choose to optimise for background services. You can also change the virtual memory settings. You can have one swap file per drive, each with different sizes (Check the tip **Optimise virtual memory** in the Windows 98 section for more on swap files). You will notice that here you can also set the maximum registry size. You should not set this to a very low value, or you will start facing problems as you

install more programs. Setting a small size does make a difference though—Windows loads the registry into memory, so the smaller the registry, lesser is the memory used.

Maintaining temporary files

By default, Windows 2000 sets up different Temp folders for each user along with the \Winnt\Temp folder. Thus, when clearing out temporary files, you have to check this folder, as well as the Temp folder under each user's account profile, under \Documents and Settings\<User>\Local Settings\Temp. This is as unmanageable as it is irritating. Fortunately, you can change this behaviour. Open **Control Panel > System > Advanced** and click Environment Variables. You will see two boxes for User variables and System variables. Delete the TEMP and TMP variables for the user, or set their paths



Change environment variables

to %SystemRoot%\TEMP. You will have to repeat this for every local user.

Power boot

On the System Properties dialog, under the Advanced tab, click Startup and Recovery to change the boot options for the NT Flex boot loader. If you have only Windows 2000 installed, disable 'Display a

list of operating systems'. If you dual boot with another OS, reduce the amount of time for which the boot options are displayed. Thus, when you switch on your PC, you will not have to hang around to press [Enter] to load Windows.

Automatic Logon

If yours is a single-user PC, or a particular user logs on to Windows 2000 most often, you can have the operating system logon automatically with that user's credentials. You should not use this if security is a concern. If the computer is part of a workgroup and not logging on to a domain, open *Control Panel > Users and Passwords* and uncheck 'Users must enter a user name and password to use this computer'. On the Advanced tab, uncheck 'Require users to press Ctrl-Alt-Del before logging on'.

If Windows is set to log on to a domain, you can enable this functionality by editing the registry. Start *regedt32* from *Start > Run* and navigate to *HKEY_Local_Machine\Software\Microsoft\WindowsNT\CurrentVersion\Winlogon*. Create the keys *DefaultDomainName*, *DefaultUserName*, and *DefaultPass-*



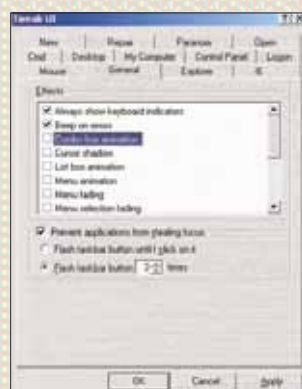
Log on automatically to Windows 2000

word and enter the domain, user name and password to automatically log on to.

Using Tweak UI for Windows 2000

Tweak UI for Windows 2000 is a very powerful tool to modify system settings. Though the installer is the same one as for Windows 98, the options available and its behaviour are different in several respects. On installing Tweak UI, you can launch it from the Control Panel.

On the General tab, turn off Combo box animation,

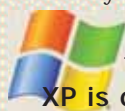


Tweak UI for Windows 2000

Cursor shadow, List box animation, Menu animation, Menu fading, Menu selection fading, Smooth scrolling, Tooltip animation, Tooltip fade and Window animation. Switch to the IE tab and uncheck the box to 'Allow Active Desktop to be turned on/off'. On the Paranoia tab you can disable Autorun for audio and data CDs.

Options on the Cmd tab let you configure keys to automatically complete file and directory names at the Com-

mand Prompt. For example, you can type in the first character of the file or directory name and press Tab to have Windows fill in the rest for you. This is extremely useful even if you work only occa-



WINDOWS XP PROFESSIONAL

XP is quite user-friendly with an impressive interface, but is sluggish on low-end systems

Change the theme

The default Windows XP theme looks very pretty, but hogs a lot of system resources for the eye-candy effects such as bevelled objects and transitions. If looks are not important to you, switch over to the classic Windows look. To do this, right-click an empty area

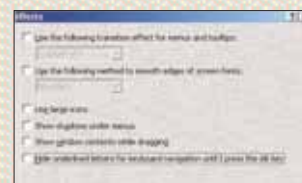


Switch to the classic Windows theme

of the desktop and click Properties. Under the Themes tab, set Windows Classic as the current theme and click OK.

Turn off display effects

Switching off transition and animation effects can save a lot of system resources. These effects are not required to run programs and cause an unnecessary load on the



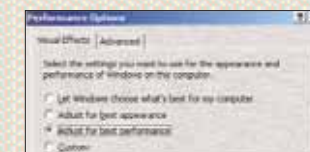
Disable all display effects on XP

with the Command Prompt. On the Logon tab, you can set an account to automatically log on after booting Windows. This is useful for single-user PCs, or where security is not critical.

processor and RAM. Right-click on an empty area of the desktop, click Properties and switch to the Appearance tab. Click Effects and clear all the checkboxes.

Choose performance

Windows XP has some very good features to maximise performance. Unfortunately, the default settings are no good. You can choose to have it optimise itself for faster computing. To change these settings, click Start, right-click My Computer and click Properties. Switch to the Advanced tab and click the Settings button under Performance. By default, 'Let Windows choose what's best for my computer' is selected. Choose 'Adjust for best performance' instead, and you will almost immediately notice a boost in speed. This is because all graphic effects are turned off. You can



XP lets you optimise the OS for performance

7



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optionally choose each type of effect that should be enabled from here, but if it's power you are looking for, leave them all off. Note that the behaviour and appearance of a lot of Windows such as the Control Panel, will become quite different. If you prefer the helpful wizard-like interfaces, you may want to sacrifice a bit on performance and enable the option to 'Use common tasks in folders'.

Paging options

On the Performance Options dialog (right-click My Computer and click *Properties* > *Advanced* > *Settings*), click on the Advanced tab to access even more performance features. You can adjust the processor and memory options, but for desktop PCs



Changing swap file settings in XP

you should leave the default options (optimise for Programs). What you should change are the virtual memory settings. You can have one swap file per drive (Check the tip 'Optimise virtual memory' in the Windows 98 section for more on swap files). Set the

optimum size and click OK.

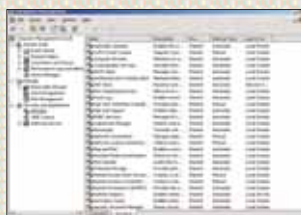
Boot options

If you are not booting multiple operating systems, you can turn off the option permanently, until it is required. If there is another OS on your system, say Windows 98, you can reduce the amount of time the option to choose which OS to load is displayed. Right-click My Computer, click *Properties* > *Advanced* and click the Settings button under Startup and Recovery. Here, you can choose which operating system to boot by default. You can uncheck the boxes to show the boot options, or select the number of seconds for which the choices are displayed. Five seconds is usually more than enough.

You will notice recovery settings in case of a system failure. Alerts and debugging information will not be very helpful for most users, so you can turn these options off too.

Turn off services

Depending on your computer's configuration and options chosen when installing Windows XP, it will have certain services enabled. Many of these you may never require and can safely switch off. You can disable a service so that it



Reduce load on CPU and RAM by turning off services

never runs, or set it to be manually started.

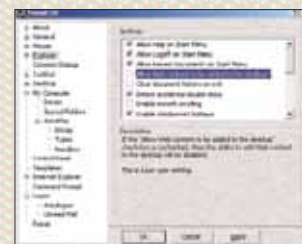
Right-click My Computer and click Manage to bring up the Computer Management console. On the left pane, select Services under Services and Applications to control all installed services. The easiest way to filter through the list is to sort it by the Status column. Services that are 'Started' are the ones you need to look at. (Read more on services in the tip 'Get rid of services' under Windows 2000 Professional'.)

Quit indexing

The Indexing Service stores information from documents and organises it for faster searches. This is not useful to many users, especially if the documents are well organised. Not only does this service take up system resources, it also involves frequent read/write operations to the hard disk, which are particularly slow. From the Computer Management console (right-click My Computer and click Manage), select Indexing Service from the left pane under Services and Applications. You will see the list of catalogues on the right pane. If any of them are started, you can stop them from here, and even delete the catalogue. Optionally, you can expand the tree on the left pane for each indexed item and restrict the folders it scans.

Tweak UI for XP

Tweak UI is available for Windows XP too. It gives you access to quite a few system settings that are otherwise not readily available, and can help



Power up with Tweak UI for XP

gain that extra inch of power from XP. You can download this version from www.microsoft.com/windowsxp/pro/downloads/power toys.asp.

Under General, you can turn off display effects such as fading and animations. Under Explorer, uncheck the boxes for 'Allow Web content to be added to the desktop' and 'Enable smooth scrolling'. Expand the Explorer tree, select Thumbnails and move the Image Quality slider to around the centre. Next, expand the My Computer > AutoPlay branch. Under Drives, you can disable AutoPlay for all drives, thus reducing this overhead. Under the Types branch, you can choose to disable AutoPlay for CD, DVD and removable drives.

Under the Command Prompt branch, you can configure special keys to automatically complete file and directory names, as on a Unix system. If you have a single-user system, you can have XP logon automatically from Logon > Autologon. Under Logon > Unread Mail, you can disable the notification of new e-mail messages for each user. Not only is this more secure, but it also reduces the overhead of polling for new messages for every user. ■

13 Scariest games ever!

Sit back unblinkingly as we assail you with 13 of the most chilling, most daunting, the spookiest, the scariest, the creepiest games you can dare experience on your computer. Best taken in large doses with the lights down and headphones on—if your heart rate doesn't increase, you might need to check if you had a pulse to begin with. ■

AHMED SHAIKH

ALONE IN THE DARK



Released: 1992
Developer: Infogrames
Publisher: Interplay Productions

The grandfather of all action-adventure games, *Alone in the Dark* is based loosely on the works of H.P. Lovecraft. Like the source of inspiration, the game's plot can leave you senseless at times and perpetually hanging in mystery. It was the first game to involve the player in an immersive and cinematic gaming experience. Stark camera angles and 3D graphics (a rarity then) heightened moments of suspense within the cursed 'roach-motel' like mansion of Decerto—you can check out anytime you like, but you can never leave!

GABRIEL KNIGHT II: THE BEAST WITHIN



Released: 1995
Publisher: Interplay Productions,
Developer: Infogrames

The *Beast Within* is a gala of ghoulish adventure that mesmerises and thrills through visceral explosions that span six CDs. The game sets off with an investigation into a possible werewolf sighting and uses live action sequences against backdrops shot in Germany—filmed against a blue screen and then seamlessly combined with over 1,300 photographed settings. An interestingly executed story threads historical facts with fictional musings to form a weave rich in intrigue, horror and mystery.

PHANTASMAGORIA

If a reported budget of \$4,000,000 does not put fear into your soul, then maybe a morbid and ghastly storyline will. Created by the mother of adventure games, Roberta Williams (of *King's Quest* fame), *Phantasmagoria* is an achievement in that it comes the closest to delivering a cinematic experience. Victoria Morsell stars as Adrienne Delaney, the protagonist of the game and David Homb as Don Gordon, her loving, albeit homicidal husband. They were blue-screened and digital background footage was later added. Created when an in-game cutscene was all the rage, this game effectively uses the said tool to bump an ordinary story into the twilight zone of a B-grade movie.



Released: 1995
Developer: Sierra Games
Publisher: Sierra Games

FRANKENSTEIN: THROUGH THE EYES OF THE MONSTER

So, you are wrongly accused of murdering your daughter. To make things worse, you are promptly hanged, undoubtedly a very gentlemanly thing to do. End of a bad day's living you think? Not if you happen to be buried in the vicinity of a spade-happy doctor. *Through the Eyes of the Monster* resurrects you, the player, as the beastly creation of one Dr Frankenstein, a part played quite hauntingly by the peerless Tim Curry. Browsing through his laboratory and the accompanied collection of oddities is twice as fun with Tim growling threateningly at you, complete with an eerie soundtrack.



Released: 1995
Developer: Amazing Media
Publisher: Interplay Productions

THE DARK EYE

With the works of Edgar Allen Poe forming a firm inspirational platform, *The Dark Eye* descends into the madness of one man's twisted world. The game presents an exploratory experience into the minds of the insane, murderers and their victims. Rendering the Floyd line of "all you touch and all you see, is all your life will ever be", the game draws upon animate and inanimate objects to throw you ever deeper into the realms of sinister designs and the resulting dismay. A troubling saga triggered by a sniff of paint thinner. The game uses stop-motion character animations, populates a multiple-story path with strong personalities and adds another layer of richness via the voice of legendary author William S. Burroughs.



Released: 1995
Developer: The Dreamer's Guild
Publisher: Expert Software

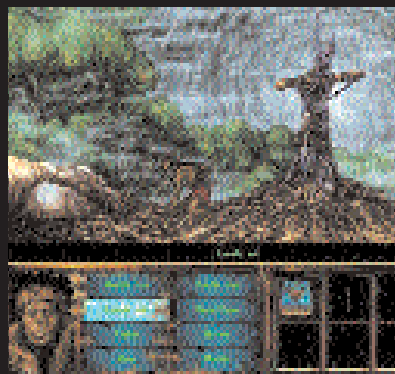


Released: 1996
Developer: Hue Forest Entertainment
Publisher: Hue Forest Entertainment

AMBER: JOURNEYS BEYOND

Frighteningly fashioned by the husband and wife team of Frank and Susan Wimmer, *Amber* is a game that begs to be experienced. *Journeys Beyond* takes you on a disturbing walk beyond the grave. It teasingly flashes glimpses of past mysteries and tempts you to discover the secrets of life after death by possessing the souls of the dead still searching for peace. Inhabit, for example, the soul of a dead child tethered to the realm of the living by the loss of his beloved teddy bear. Drink of the game with lights off and snippets from this gem are sure to haunt your waking dreams.

I HAVE NO MOUTH AND I MUST SCREAM



Released: 1995
Developer: Inscape
Publisher: Expert Software

Welcome Gorrister, the suicidal loner, Ellen a hysterical engineer (a phobia of the colour yellow stalks him), Benny the soldier (now evolved into a simian), Nimdok, an ancient (hence mean-spirited?) man and Ted, a cynic and paranoid to boot. These fine specimens of humanity are Earth's only respite against AM—an insane computer that has logically deduced that mankind's only hope is an annihilation of the species.

Based on Harlan Ellison's short story, 'I Have No Mouth, and I Must Scream', the game complements the text very well, extending the Hugo award-winning tale further into the world of tortured souls and hidden pasts. Provocatively sprinkled with psychological musings, *I Have No Mouth* succeeds in offering a very mature premise: there is no victory greater than defeat. An intellectually terrifying experience.

SANITARIUM



Released: 1998
Developer: DreamForge
Intertainment Inc
Publisher: ASC Games

Sanitarium is a journey of metaphors that begins with the age-old question of Who am I? The horrors flow from the id that forms the landscape of humanity. Self-discovery is a scary concept and *Sanitarium* proves just that. The 'How did I get here?' throws you into a world of grotesque denizens—the strange that are familiar and the familiar that are strange. Reconstruct your past and unravel the horror of self.

RESIDENT EVIL



Released: 1995
Developer: Capcom Entertainment
Publisher: Virgin Interactive
Entertainment

Resident Evil took the mantle of scaring gamers from the veteran *Alone in the Dark* series. The roller coaster begins the moment you see a rather famished zombie feasting upon the remains of one of your friends; the horror then pours on relentless as the shocks and the gore never cease, always in your face and sudden. The ride is hampered by bad voice acting, but the cinematic flair of the game sends shivers of horror down the spine.

ALIENS V/S PREDATOR 2



Although the game pits three species against each other—Aliens, Predators and Humans—the scare factor is multiplied manifold within the human campaign. No opportunity is spared here to thrill and shock you: with a motion detector as the only source of salvation against the other species, playing as a Human will have you at the edge of your seat every time you spot a blip on the sensor—could it be an Alien face-hugger, a Predator? You clench your flamethrower and turn the corner only to relax at the sight of a swinging hook. As you lower your guard and switch off the flashlight, a Praetorian lunges from the rooftop and goes for your head. Tag! You are prey.

Released: 2001
Developer: Monolith Productions, Inc
Publisher: Fox Interactive, Sierra Games

UNDYING

You walk down a nursery and sounds of children playing and laughing fill the chilly air—you see nothing, no one breathes but you, no footfalls but yours. The laughter gradually fades into whimpers of tribulations, which then cascade into a horde of blood curdling screams of pure pain. The fear rising within you forces a stronger grip on your trusty scythe. As you take the corner, silence greets you, then a scream followed by its source: a floating brain that would like nothing better than your blood. The *Undying* has begun.



Released: 2001
Developer: Dreamworks Interactive
Publisher: Electronic Arts

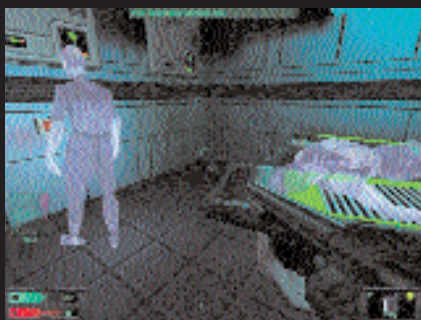
DOOM



Released: 1993
Developer: id Software
Publisher: id Software

DOOM is raw, naked dread. So unabashed in the primal impulses that it sends coursing through your senses, the game claws away at your brain and feeds your psyche with enough frenzy to keep you going longer than that bunny hotwired into unlife via an alkaline battery. A maddening struggle within a web of survival, it has spawned an industry, spanned a decade of computer life that's like a millennium in human years. *DOOM*'s legacy of pain promises to continue with a third chapter due next year.

SYSTEM SHOCK2



Released: 1999
Developer: Irrational Games, Looking Glass Studios
Publisher: Electronic Arts

Bodies sway from the ceiling; apparitions reconstruct their deaths, filling your senses with fear and dread. As you cling on to dear life, clawing your way through a labyrinthine spaceship that could turn into your coffin, you are taunted to the verge of insanity by SHODAN, a computer with a God complex and your nemesis. You are trapped billions of miles from Earth with a mass murderer on the loose—best enjoyed alone in the dark with a good pair of headphones.

Scared Yet?

If the ghosts of the past do not twist your innards in fear, then this stream of fresh blood is sure to blind your senses with terror and apprehension.



DOOM III

id Software takes a stroll down memory lane and invites us back to the future with the hotly anticipated *DOOM III*. Mindless zombie-killing, shotgun-pumping, slap-me-silly-and-point-me-to-the-ammunition action awaits us at the end of the rainbow—the same great taste now with super-duper graphics and 5.1-channel Dolby sound. Buy your copy today! Or when it's out, which ought to be sometime this year.

Silent Hill 2

*In my restless dreams I see that town,
 Silent Hill...
 You promised you'd take me there
 again someday,
 but you never did.
 Well, I'm alone there now
 in our special place, waiting for you...*



A 'Dear James' letter addressed to one Mr Sunderland that is twice as scary since the author is his wife and three years dead. *Silent Hill 2* is a port of the PlayStation 2 survival-horror game that has mesmerised console gamers with terror. It promises to treat us PC gamers with the same mental derision.

Call of Cthulhu: Dark Corners of the Earth

How's this for a setup? You are cast as Private Investigator Jack Walters, an ex-cop trying to locate a missing person in the mysterious fishing village of Innsmouth. Hmmmm...scope for a horror action/adventure game, you think? Based on the works of H.P. Lovecraft, *Dark Corners* is expected to cast shadows of self-doubt onto the reptilian mind within us, late this year.



On Her Majesty's Secret Service

No One Lives Forever 2: A Spy in H.A.R.M.'s Way, stole our hearts away. We present a briefing on being the best darn spy the digital world has ever seen



Die Another Day

To cheat in the game, hit Talk [T] while playing and type the following codes:

<i>guns</i>	gives you all weapons
<i>skillz</i>	gives you skill points
<i>ammo</i>	gives you ammunition
<i>armor</i>	gives you full armour
<i>health</i>	gives you full health
<i>god</i>	makes you invulnerable
<i>poltergeist</i>	makes you invisible
<i>maphole</i>	lets you skip levels
<i>pos</i>	indicates your position

For Your Eyes Only

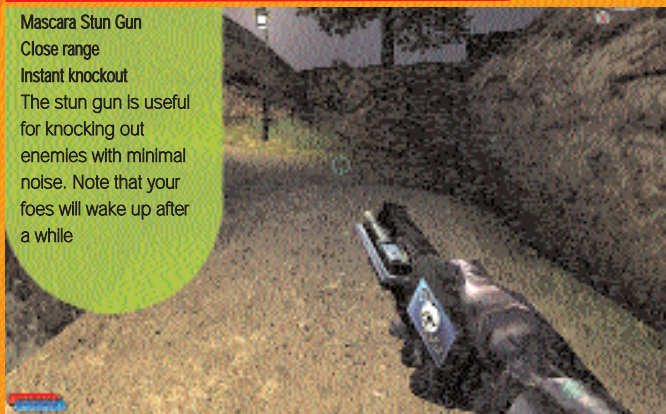
Search is life: Always search bodies when it's safe to do so. You'll find notes, weapons, health and armour items this way, especially if you have invested well in the Search skill. Quick searching a body (briefly right-click it), will pick the ammunition and weapons off it—you can then move the body out of sight and search it more thoroughly with time and safety.

Eye can't see: While inside buildings or enclosed areas, look around for light switches and turn them off. Exposed light bulbs can be unscrewed to create a dark area in which you can hide. Listen to the whir of close circuit cameras and use the Camera Disruptor off the Utility Launcher to safely disable the same and clear your path.

Ask for directions: Your handy compass also doubles as a tool to indicate the status of your current mission. A red 'X' mark on your compass indicates an intermediary objective you need to tackle. A red 'i' marks the location of a major task. Finally, red dots indicate locations of people you have tagged with tracking beacons.

Live and Let Die

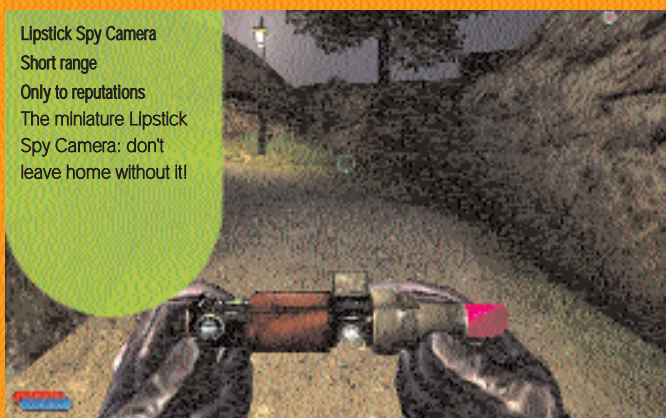
Mascara Stun Gun
Close range
Instant knockout
The stun gun is useful for knocking out enemies with minimal noise. Note that your foes will wake up after a while



Angry Kitty
Proximity device
Very high
The Kitty explodes when an enemy ventures within its detection radius—its detonation can attract unwanted attention



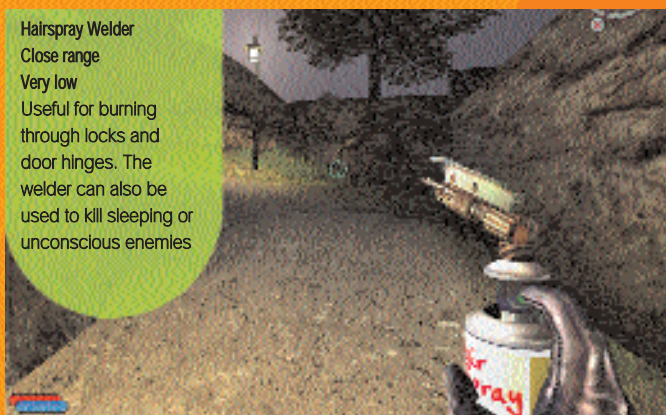
Lipstick Spy Camera
Short range
Only to reputations
The miniature Lipstick Spy Camera: don't leave home without it!



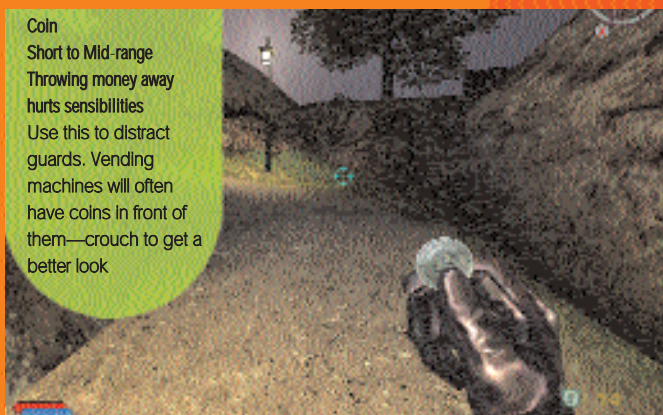
Body Remover Perfume
Close range
Liquidate unwanted assets
To prevent enemies from spotting fallen comrades and hence raising a ruckus, use this perfume and completely disintegrate a body



Hairspray Welder
Close range
Very low
Useful for burning through locks and door hinges. The welder can also be used to kill sleeping or unconscious enemies



Coin
Short to Mid-range
Throwing money away hurts sensibilities
Use this to distract guards. Vending machines will often have coins in front of them—crouch to get a better look



Off the Shelf



BEACH HEAD 2002

Being Private Ryan

Stuck as the lone gunman taking a dying stance on a beach under assault? That's what you get for getting frisky with the General's daughter! *BEACH HEAD 2002* calls for one good man, you, to defend a solitary strip of beach armed with a 30 mm gun, your antitank gun, some missiles and for those ammo-starved days, a handgun. The available weapons vary between levels, thus avoiding tedium that would have otherwise have crept in. The game also features friendly bombers that drop crates of ammunition and armour. The catch being that you need to shoot the boxes out of the air in order to replenish the same attributes. Every few missions, the game plunges you into a night time



PRETTY MEN ALL IN A ROW: You shoot one down, he falls to the ground, 99 more to go

mission. A workday is never dull with companies of soldiers, tanks, attack helicopters, bombers, fighter planes and

troop carrying vehicles making regular pit stops at your local haunt. The number, frequency and the pattern of visitations, of course, change as you climb the ladder of levels. The game has acceptable graphics, considering its system requirements. The soldiers are sprites with minimum frames of animation, making them look jittery. There are also problems with collision detection within the game: a plane will sometimes fly right through a hill without a scratch. *BEACH HEAD 2002* calls for some insane reflexes, and shows both the addictive and the one-more-level syndrome that is the hallmark of good games. With an affordable price tag, this may be just the dose of fun that you were looking for.

Developer: Digital Fusion ■ Distributor: Milestone Interactive Software Ltd ■ Phone: 022-28381614 ■ Web site: www.fusiongames.com
Price: Rs 499 ■ System requirements: Pentium 350 MHz processor or equivalent, 64 MB RAM, 4 MB AGP/PCI video card ■ Rating: ★★★★★



Tom and Jerry in Fists of Furry

A cat and mouse game, no kidding!

Tom and Jerry in Fists of Furry is a 3D fighting game starring characters from the cartoon. The game is pretty a much direct PC conversion of the same-named hit Nintendo N64 game. It successfully brings along the same fun and zest that the series introduced.

The game features one-on-one fighting in venues modelled after classic episodes of the cartoon series such as an alley, a kitchen, a farm, etc. There are 10



PUNCH DRUNK: Jerry experiences one of the finer things in life, courtesy Tom, of course!

kitchen sink!

Combat essentially involves punching, kicking, ducking, catching and throwing household items. You can also kick an item across the floor, and envi-

levels in all, some of which you must unlock by making your way through the single player game. Characters like Tom, Jerry, Tyke, Spike and Duckling will punch, kick and assail each other with weapons that include shovels, bombs, red-hot pokers, tennis rackets, furniture, an assortment of fruits and a

ronmental hazards such as fire and falling pots can put the hurt on you. Power-ups take the form of yellow question marks and offer boosts such as invisibility and energy sapping, contagious measles. The game is quite challenging and for the most part, the challenge is well-balanced. Bouts can get frustrating, but the cartoon elements that decorate the game keep you going long enough to enjoy the ride. *Fists of Furry* is an experience that is at times enjoyable, at times frustrating, but always interesting. It's the kind of game that you occasionally get into for 15-minute sessions of action at a time. It is not likely to involve you to an extent where you would find yourself whiling away the hours until you've beaten the last level.

Developer: NewKidCo ■ Distributor: Milestone Interactive Software Ltd ■ Phone: 022-28381614 ■ Web site: www.fusiongames.com ■ Price: Rs 499
System requirements: Pentium 233 MHz processor or equivalent, 64 MB RAM, 16 MB DirectX 8 compatible video card ■ Rating: ★★★★★



The Lord of the Rings: The Fellowship of the Ring

A saga of hits and misses

Riding on the gravy train of Tolkein's work, Vivendi's *Fellowship of the Ring* is based more on the books than on the recently released Peter Jackson movie. You will find yourself in a visually rich Middle Earth, with control over one of three playable characters at various points in time. Aragorn, Frodo and Gandalf fight their way through hordes of wargs, wraiths and trolls, each armed with a unique style of play.



SHOWDOWN DURING SUNDOWN:

Aragorn gets down and boogies with some orcs

Entertaining and challenging, the combat serves as the central element of the game. It's great fun playing as Aragorn, with his stylish moves and a cool, quick-draw, bow-action. Gandalf is just as engaging; his repertoire of spells makes short change of any foe—orc or Balrog. While both Gandalf and Aragon can dish it out, you will find yourself avoiding confrontations (running for the exit is a frequent occurrence) while playing as Frodo. He carries weapons that force a dodge-and-counter style of combat. The hobbit can use the One Ring to render himself invisible, but this property of the Ring is almost never needed.

The levels are generally well designed, but some come across as just plain needless: they seem to have been added to either give each character enough of a role within the game, or for the sake of contributing a little more than the movie. Puzzles found within are at times easily solved while at others are a source of frustration. The in-game cinematics are badly choreographed: the



RINGS AROUND THE WRAITH:

Aragorn and Gandalf can slay the beasties

characters seem to be in a hurry to finish their dialogues and transitions from one scene to another are a bumpy ride.

Somewhat related to the movie, the game boldly sets out on a new path, attempting to present an experience that is different from, but complimentary to the film. The offering does waver from its set road: some aspects of the game have been well executed while others fall short of expectations.

Genre: Third person, action-adventure ■ Developer: Black Label Games ■ Distributor: World Wide CD Roms ■ Phone: 022-26973894
Web site: www.lordoftherings.com ■ Price: Rs 1,299 ■ System requirements: 600 MHz processor, 128 MB RAM, 32 MB DirectX 8 compliant video card ■ Rating: ★★★★★



3DS MAX 4: GROUND RULES

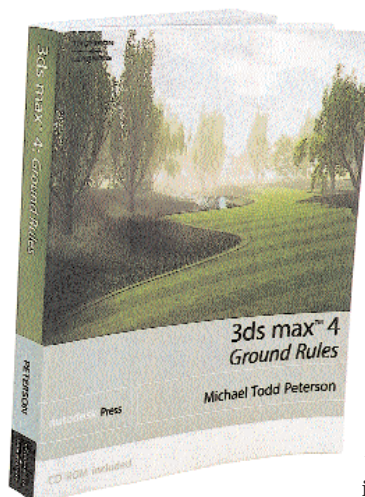
To begin, click here

3ds max 4: Ground Rules is a tailor-made book for beginners starting out with 3D Studio Max R4—every aspect of the software, from the basics of the user interface, to modelling, rendering, animation and special effects, is covered in a lucid and clear language.

The book does not limit itself to the basics—relatively advanced topics such as network rendering and inverse kinematics have also been covered. Complex special effects are also touched upon briefly, without going into the deep details that might baffle a new learner. The emphasis is on basic techniques, interface layout and usage, making it easier for new users

overwhelmed by 3ds max's interface to get their work done.

The accompanying CD has actual screen captures of all the operations described in the book. Organised by way of chapters, the CD has visual representations for everything the book describes. Along with the final rendered animations, these videos leave little to the imagina-



tion. On the whole, *Ground Rules* is a very wholesome book, covering all the features present in 3ds max4.

However, none of the topics are covered in depth, which makes this more of an introductory book. Recommended reading for absolute beginners venturing into the realm of 3d animation and who want to learn 3ds max in its entirety.

Publisher: Autodesk Press ■ Contact: Computer Bookshop ■ Phone: 022-22070989/22076356 ■ Fax: 022-2623551
E-mail: cbsbom@giabm01.vsnl.net.in ■ Price: Rs 1,100
Rating: ★★★★★

Learning is Fun

Going back to school, but with a difference

Ever since the start of India's first technology media institute, Media One, in September 2002, the offices of Jasubhai Digital Media have been abuzz with excitement. Media One offers hands-on training in Media Management, which includes components relating to technology as well as allied areas such as design, research and production.

The students at Media One are exposed to every aspect of digital media and technology in a practical way. Besides daily assignments, frequent field visits to media and technology companies and lectures from industry professionals, the students put in practical work hours as part of an editorial group, at the Test Centre or Media Studio amongst other things.

Abhiram Iyengar, a Bachelor of Electronics from Karnataka, is from the first batch of Media One students. He recently got his feet wet in the Digit Test Centre. Here's what he had to say: "From the time I joined Media One and was introduced to different departments within Jasubhai Digital Media, the Test Centre was what attracted me the most. The place is full of the latest computer peripherals and is heaven for anybody remotely interested in technology.



Hard at work in the Test Centre (left): A rigorous schedule, unrelenting assignments and lots of fun

Learning the trade from the best in the field (below): Bimal Biswas, a cinematographer with MTV, reveals his bag of tricks

On my first day itself I was assigned a bunch of games to review. Within a matter of hours I'd played every type of game conceivable, from Adventure, Arcade, RPG to FPS and RTS games. And that was not all. I was supposed to write mock reviews on each game I played, taking into account its graphics and sound quality, ease of use of the interface and the



overall gameplay experience. Boy was it fun!

Over the next few weeks, I tested and wrote a number of articles on processors, motherboards, chipsets, and graphics cards. This improved my knowledge on how each component works and the relationship between the various subsystems of a PC. It also gave me an insight on some new technologies on the horizon and a look at how the PC market operates.

I also had the opportunity to attend presentations by various technology companies and attend some press conferences. Currently I'm engaged full time in testing motherboards and learning the nitty gritty of using various benchmarking software. Other than all this, I also learnt what it is to work under constant pressures of deadlines and the importance of working smarter by planning ahead in today's fast paced workplace. All in all, it's been a truly wonderful experience." ■

Gone with the Wind!

The beginning of the New Year is always a good time to undertake new endeavours and head to explore new frontiers. And two of our oldest hands, Veer Kothari and Marco D'Souza, have decided to explore the world beyond the friendly familiar walls of JDM. While they may be just a few names at the bottom of the article for most of you, Sweet Marco, as we like to call our Head of Writers, is infamous around the Navi Mumbai locale for his Indica by day and Quakemobile by night, just as Veer is for his white Astromobile—both being our chariots of choice during late nights at work and other escapades.

Marco leaves behind fond memories of his days as the head of Test Centre, his trusty, well greased keyboard and a screen-

shot showing the word count of his last cover story for Digit: a staggering 16,315 words. Veer, on the other hand, leaves behind a hard-to-fill space as a permanent resident of the JDM premises, the sensibilities of a first aid box and a huge, happy sunflower.

Saying that they will be missed is a gross understatement. We'll probably never come across anyone with the same unerring precision in matters of technology, astronomy and pretty much everything else under the sun as Veer. Or for that matter, we're sure nobody will match up to Marco's charming ways of dissuading us all from working on a weekend.

All the best for the future to these comrades!



GONE WITH THE WIND!

WOW! ▶
Can we have this as
our New Year's gift?

One for the desktop!



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on
Uttaranchal Day**

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417 Ghz**

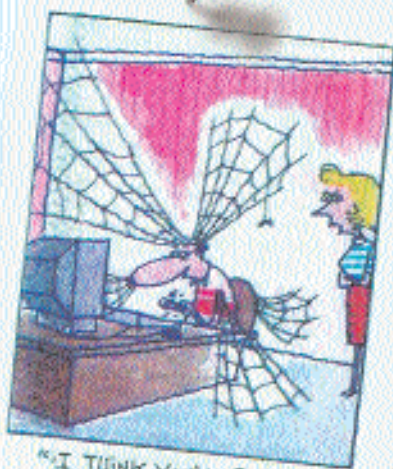
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