



GoLive 6 vs Dreamweaver MX

Insight: Parhelia & P10 video chips

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July 2002

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# PRINT it OUT

The bottom line on **22 INKJETS**



## In Focus

### 17 Digital Cameras



## Patch Work

Stitch up faulty software



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for your ailing **PC**

Protect yourself  
from **POWER CUTS**



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# Back to School

**G**one are the days when a basic diploma in Web authoring could secure you a job in just about any company that had a dotcom somewhere in its name.

Today you won't find ads from training institutes offering you a life-altering career path. The bubble has burst, shattering with it the illusion that anyone with ground-level knowledge of computers can succeed.

Just having a diploma in computer applications is not enough. Internet companies, like all others, need to be built upon fundamental business principles and employers are looking beyond basic computer literacy to whether you have knowledge about these traditional aspects of business.

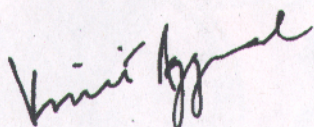
Please wake up and smell the coffee. Computers are only a tool to aid productivity. Talent and tool skills are two different things. Spending thousands of rupees on learning Photoshop and Dreamweaver is not going to take you far if your fundamentals of design are weak or if you lack the ability to visualise.

Companies are cleaning up their act and will not hire anybody and everybody. Recruitment policies have become stricter. No longer can you waltz your way into a company by simply knowing the buzzwords of technology. Experienced and knowledgeable people holding degrees are preferred over inexperienced and 'know-it-all' geeks. Soft skills such as strong communication skills, the ability to learn and adapt in different environments, along with people management experience are imperative.

The only way you can tide over this period of strife is to get back to the basics and rethink on your core competencies. It's wiser to expand upon your inherent skills than to join some training institute to 'learn' computers just because your neighbour and her brother are doing so. Stay in school and acquire traditional qualifications in economics, marketing or engineering. You can then use your computer skills to hone your core areas of expertise.

Similarly, if you're a programmer or software engineer, keep yourself abreast of the latest technology curve. It's not enough to rest on the laurels of your paper qualifications.

Hard work, constant learning and upgrading one's skill-sets and a never-say-die attitude are the way to fame and glory, because these are the only things that remain constant in this unpredictable world of technology.



vinit\_aggarwal@jasubhai.com



**Vinit Aggarwal**  
Assistant Editor

“No longer can you waltz your way into a company by simply knowing the buzzwords of technology”



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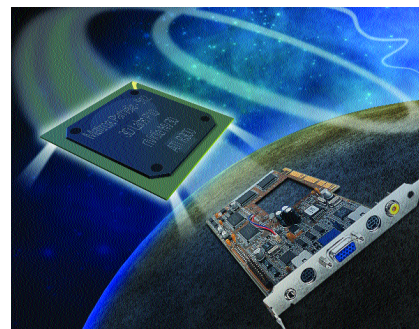
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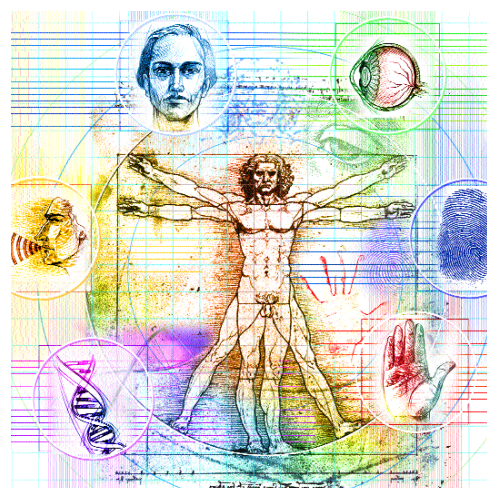
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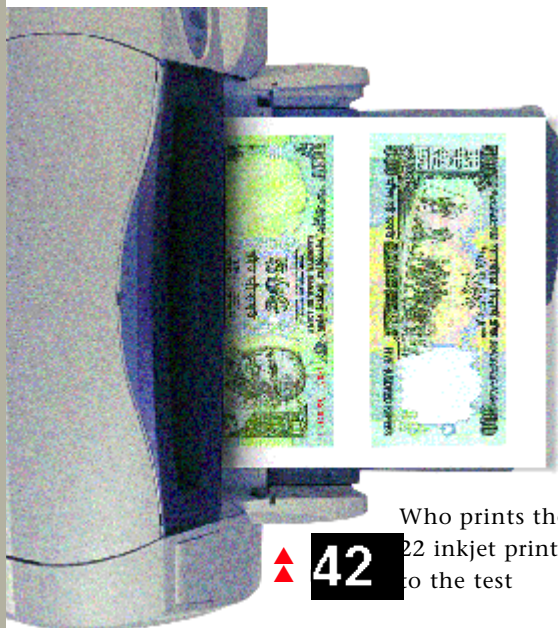
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**Advanced Font Catalog 1.0**

Size: 599 KB

Mindware\Software\Multimedia

**AVAST! Home Edition 3.0.427**

Size: 9.9 MB

Mindware\Software\System

**BounceOut**

Size: 1.34 MB

Playware\Arena\FunZone

**Civilization III Patch 1.21f**

Size: 7.3 MB

Playware\Arena\Extras

**Flow LT 4.0**

Size: 9.9 MB

Mindware\Software\Office

**Ghost Installer Free Edition 2.2**

Size: 2.9 MB

Mindware\Software\Developer Tools

**Jets'n'Guns 0.952b**

Size: 12.1 MB

Playware\FunZone

**Microsoft Baseline Security Analyzer 1.0**

Size: 2.5 MB

Mindware\Software\System

**Netscape 7.0 Preview Release 1**

Size: 26 MB

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**Pennypincher 2.5**

Size: 2.38 MB

Mindware\Software\Home

**Research-Desk Professional 2.3**

Size: 4.79 MB

Mindware\Software\Office

**Serious Boot**

Size: 1.4 MB

Playware\Arena\Extras

**SOAP Toolkit 2.0 SP2**

Size: 9.2 MB

Mindware\Software\Developer Tools

**ThumbsPlus (32-bit) 5.01**

Size: 12.12 MB

Mindware\Software\Multimedia

## PLAYWAREARENA

Have a flair for PC gaming, do you? Well, then you should start off with the **Arena** section on the Playware CD. If you've got the hardware, we've got the action! Check out the latest in 3D game demos right here. If you're just taking your first steps towards gaming and are not amongst the lucky few with a 3D graphics card, then check out **Funzone**, where you'll find just the right games for you. If its mods and patches that you're looking for, for your full version of *Half-Life* or *Quake III*, then you'll find them in the **Extras** section. Simply put, this is where all the action is!



▲ Cricket 2002



▲ F1 2002



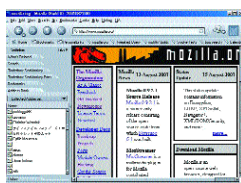
▼ Tony Hawk's Pro Skater 3

## Mozilla 1.0

Mozilla 1.0 is finally here and includes features not found in Internet Explorer. It is skinnable and allows you to change its looks. You can also choose to disable multiple popup windows on Web sites, and open multiple browser windows and display multiple Web pages in a single tabbed window.

**Size: 10.3 MB**

Mindware\Software\Internet



## SOTO Office 2002

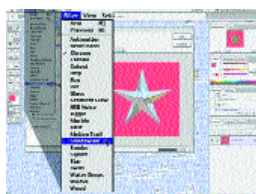
A free productivity suite for Windows and Linux, SOTO Office 2002 is the only office suite you will ever need. This full-featured, high-quality software suite is fully compatible with other major office applications. You can open and save DOC, XLS and all your usual file formats with SOTO Office.

**Size: 41.3 MB**

Mindware\Software\Office



## Eye Candy 4000



Eye Candy 4000 is a collection of 23 time-saving filters that will help add sparkle to your designs. This filter set combines practical effects such as shadows, bevels and glows with stunning effects like Chrome, Fire, Smoke and Wood.

**Size: 573 KB**

Mindware\Software\Multimedia

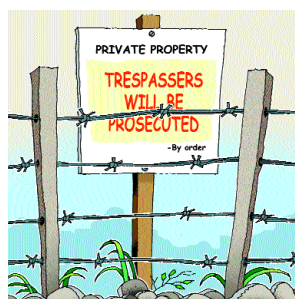


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## Web Special



### Unbreachable Security

If you're being hounded by spam mail or feel at risk from virus and Trojan attacks, then these Tips & Tricks should help you safeguard your PC.

## Features

### Netreturns

Think you know everything there is to know about the Internet? Think you've 'been there, done that'? Well, think again! This section will give you an insight into various aspects of working with the Internet.

## Test Drive

### Reviews



Our Bazaar section brings you the latest hardware and software reviews, tested and rated by our very own Test Centre.

## Web Special

### Virtual Jammin'

If you have an ear for music, all you need is a PC with multimedia capabilities and the right software, and you could be on your way to becoming a virtual DJ!





## VOLUME 2, ISSUE 7

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## digit Promise to our readers

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this in mind before affecting any  
product purchase.



# news feed

DIGIT JULY 2002

## hypothesis

### DATAPLAY

#### ■ What is it?

A digital media storage format that lets you record any kind of digital content on it, be it music, games or images. You can then play it on any



device that is DataPlay enabled, which is, any device that incorporates the DataPlay micro-optical engine for recording and playing the media.

#### ■ Why DataPlay?

It can record and play back any type of digital content, is just 32 mm across and sells for a mere \$10 (Rs 500) for a 500 MB blank media (also available in 250 MB capacity). It can be pre-recorded for mass distribution or can be recorded and customised by a consumer.

#### ■ How do I start using it?

The DataPlay micro-optical engine is the player/recorder for DataPlay digital media. It's designed for easy integration into digital music players, digital cameras, PDAs, cell phones, etc. The micro-optical engine is about the size of a matchbox and features a 1 MBps transfer rate. You will be able to purchase DataPlay-enabled consumer electronics devices later this year.

## United we stand!

Caldera, Turbolinux, Conectiva and SuSE have announced that they will merge their separate Linux products into a single version called UnitedLinux ([www.unitedlinux.org](http://www.unitedlinux.org)) by the end of 2002. The com-



panies plan to share research costs and to make it easier for hardware and software companies to certify that their products are compatible with Linux. Conspicuous by their absence are Red Hat, the current top vendor for Linux, MandrakeSoft and Sun Microsystems.

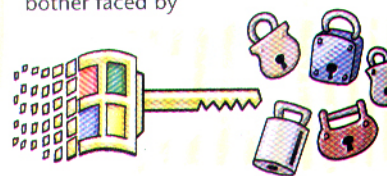
Linux was riding the popularity wave in the late 1990s and became prominent enough for Microsoft to sit up and take

notice. But things are different now. Several Linux start-ups such as Linuxcare have folded, and SuSE and Caldera have undergone massive restructuring. This precarious scenario gave birth to the formation of UnitedLinux.

UnitedLinux pools resources of these four vendors while giving much of the technological control to SuSE, simply because SuSE is the only Linux seller that has a development staff that's comparable to Red Hat's. The first version of UnitedLinux will basically be the next version of SuSE's advanced server edition, coupled with features provided by the other companies.

## Microsoft extends the bridge of trust

Software giant Microsoft is developing a technology codenamed TrustBridge, which it claims will help reduce the bother faced by



workers in big companies having to go through several user authentications and passwords. This is also a move to compete against the Liberty Alliance Project which is backed by rival Sun Microsystems. The Alliance, launched in September 2001, now has more than 40 members, including United Airlines, Sony, Fidelity Investments and AOL Time Warner.

While Microsoft's existing Passport single sign-on ID system is targeted at consumers, with TrustBridge, business users will be able to log onto Windows-based systems (hosted locally or remotely at partner companies) by means of a single ID. The ID can be created through Passport, Active Directory or through any other ID system on any operating system that supports Kerberos, a network security standard.

## Groove on the move

Want high quality amplified music on the move? Then take a look at the latest offering from Creative Technology. It has launched a portable speaker system with a difference—it comes with a digital amplifier built into it. Christened Creative TravelSound, it converts analogue inputs and amplifies them in the digital domain before converting the signal back into analogue to drive the speakers. The advantage of using a digital amplifier is that less heat is generated and the bat-



tery can be used more effectively. It also allows for a more compact form factor (the TravelSound weighs just 320 grams) and most importantly, high fidelity audio quality. You can use the TravelSound with portable CD and MP3 players and it is powered by just four AAA batteries.

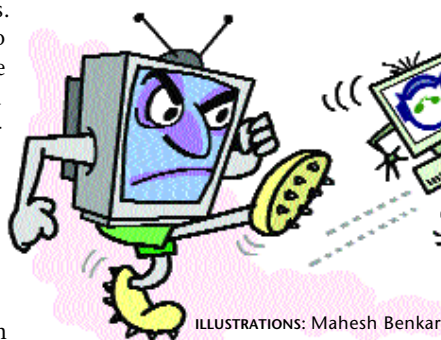
■ Via Technologies to introduce 1 GHz C3 CPU ■ Microsoft releases update to the Mac OS X version of Office ■ DirectX 9 beta released

## Regulated television?

In due time, TV signals will be broadcast digitally, giving you crystal clear reception of your favourite shows. But with digitisation's perks come its headaches. Content converted into digital files can be easily copied and exchanged over file-sharing services such as KaZaa and LimeWire. Movie studios and broadcast networks are taking measures to prevent their content from being distributed for free.

The Broadcast Protection Discussion Group (BPDG), an alliance of television broadcast networks, movie studios and electronics manufacturers in the US, has drafted a scheme that aims at preventing recordings of digital

television programs from reaching the Net and being freely swapped around in cyberspace.



ILLUSTRATIONS: Mahesh Benkar

Electronics manufacturers enter the picture because the scheme aims at controlling signals that are picked up by the TV set—they will have to include a demodulator which can distinguish between

analogue signals and digital ones. Digital signals will have a watermark, called a 'broadcast flag', embedded into their transmissions. Once the signal reaches the set, the demodulator encrypts it, allowing the content to be recorded onto other home entertainment components such as set-top boxes, DVD recorders, etc. But a viewer will not be able to put up the digital recordings on the Net.

Electronics manufacturers are not too happy, as this scheme will prevent recordable DVDs from being replayed on DVD players, which in turn won't spell any good for the development of digital recording.

## redalert

### Like father, like son

Klez.h is a true chip off the old block, Klez. It has trodden over its sibling Klez.i and is all set to overtake SirCam as the most destructive computer virus in recent times. Put together, the H and I variants of the Klez virus have superseded SirCam as the most active computer virus yet. The reason for this is that Klez.h uses different methods to disguise itself in its infection spree. And how do you fight Klez? Ensure that you update your anti-virus software regularly and have appropriate security patches installed for Microsoft Outlook.

### Nothing to smile about

Simile.D, a new concept virus, might lead to rethinking of some of the fundamentals of anti-virus software. The program has code that not only works hard to hide the virus' presence, but also randomises the program's size so as to make it harder to identify. The latest variant of the virus can affect both Windows and Linux OSes.

With viruses such as Simile.D, anti-virus manufacturers must find multiple ways of recognising the code to effectively deal with the virus. This would however tax a computer's resources as it tries to find such stealthy programs. The virus by itself doesn't do much harm—on a Windows PC, it opens a dialog box on March 17 and September 17 with the author's name and the name of the virus. On computers running Linux, on March 17 and May 17, the virus posts a message with similar content to the console.

## Windows XP update in the pipeline

Microsoft tested the first major update to Windows XP (Service Pack 1) in June 2002. Some of the important changes are the direct result of the antitrust case that the company is battling against. These changes will make it easy for consumers and PC manufacturers to override Microsoft's default products with third-party software from the firm's competitors such as AOL Time Warner and RealNetworks.

Under the Justice Department settlement, Microsoft must allow consumers or PC makers to hide user access to five pieces of so-called MS middleware: Internet Explorer, Outlook Express, Windows

Media Player, Windows Messenger and Microsoft's version of the Java Virtual Machine.

The service pack will also introduce support for new technologies such as Mira 'smart' display devices, Tablet PCs and the Freestyle digital media interface (a second XP interface for accessing the operating system's digital media functions via remote control).

Another part of the update is aimed at curbing the piracy of Windows XP. Although Microsoft had introduced Windows XP with Product Activation which uses a numeric key to lock the software to the hardware, code stolen from a

large customer led to large-scale illegal copying of XP. Those who are using illegal copies of XP will not be able to use this Service Pack or any other future updates. Microsoft expects to issue a final version of Windows XP Service Pack 1 sometime later this year.



## snapshot

Roughly **600,000** films are illegally downloaded from the Net each day, an increase of 20 per cent from 2001

Source: Viant

■ HP to try out tablet PCs with the Compaq Evo ■ U Series X drive from Seagate aimed at game consoles ■ Comverse Technology to take over Odigo



## The battle of the 64-bit chips continues

The fight between the market leaders Intel and AMD for supremacy in the 64-bit CPU market rages on with renewed vigour. As of now, there are no 64-bit consumer applications, but AMD has covered for this by its versatility—its 64-bit chip is capable of running 32-bit applications too, something that Intel's Itanium 2 chip (previously code-named McKinley) cannot. This means that it would be easier, not to mention more economical, for firms to make the move over to an AMD 64-bit CPU than Intel's Itanium 2.

Till date AMD was making chips for the consumer market, but it hopes to enter the corporate market with its Ham-

mer processors. The desktop versions of the chip, currently codenamed Clawhammer and slated for release at the end of the year, will be sold under the Athlon name. The multi-processor version of the chip for servers, codenamed Sledgehammer and due in the first half of 2003, will be sold under the name Opteron. AMD has also tied up with Microsoft and the latter will prepare Windows to run on the Hammer chips.

Meanwhile, Linux developers such as SuSE are already offering support for Hammer and the next major public update for Linux will include support for Hammer processors.

Most current 64-bit processors are not compatible with PC applications based on x86 architecture. The Itanium can handle some of those applications but suffers from performance loss—a disadvantage AMD hopes it can exploit.

AMD's 64-bit architecture is an expansion of x86 and theoretically is more versatile than any other 64-bit chip.

Intel, of course, believes its

processor is superior in every way. Intel's high-end 64-bit Itanium uses architecture that the company calls IA-64, which builds on existing design technologies and adds some new twists of its own. The Itanium 2 for its part is an improvement over the Itanium—it offers a higher clock speed and other enhancements on the performance front. Intel has also publicly demonstrated that its Itanium 2 processor, which it plans to start shipping at mid-year, will power high-end computer servers and supercomputers up to twice as fast as products from rival Sun Microsystems and its own currently shipping Itanium(1)-based systems.



## Mozilla's finally out!

More than four years in the making, Mozilla 1.0 has been finally released. Netscape Communications, which created the *Mozilla.org* project when it opened up its source code in 1998, explains this delay by saying that they wanted to ensure that the browser stood head to head with other commercial browsers against whom it certainly will be compared.

Gecko, the core browsing engine of Mozilla, supports World Wide Web Consortium recommendations including HTML 4.0, XML 1.0, the Resource Description Framework (RDF), Cascading Style Sheets level 1 (CSS1), and the Document Object Model level 1 (DOM1). Mozilla 1.0 also offers partial support for Cascading Style Sheets level 2 (CSS2), the Document Object



Model level 2 (DOM2), and XHTML. Other standards supported by Gecko include SOAP 1.1, XSLT, XPath 1.0, FIXptr and MathML.

The Mozilla movement was established in 1998 by then-independent Netscape, to create compelling Web-browsing technology to stem the increasing dominance of Microsoft's Internet Explorer. It took more than two-and-a-half years for Netscape to release its first browser using Mozilla technology. Netscape 6 was unanimously criticised as unfinished

and buggy, but future versions of Netscape 6 rectified most of those problems. And with the recent preview release of Netscape 7.0 and AOL's browser shift to Gecko technology, speculations are rife about the prospects of a renewed browser battle with Microsoft, whose Internet Explorer now dominates the Web.

But the biggest effect of the release of Mozilla 1.0 may be beyond the browser. Broadly speaking, Mozilla is a programming tool for building applications that run on almost any operating system. While developers initially concentrated on building a browser, the underlying technology can be used to create many types of applications. Some developers have already branched into making Mozilla instant messaging software, media players and other applications.

### Small is beautiful

California-based Archos Technology has launched the world's smallest and lightest hard disk drive. The Mini HD is a 20 GB hard drive that measures just 4.7x3 inches. It is 0.5 inches thick and weighs just 202.2 grams! Small enough to fit into the palm of your hand, this drive is capable of carrying regular computer files as well as images and digital music. You can simply drag and drop files into or from the Mini HD and it is 'hot swappable'—you do not have to shut down the PC each time you connect or disconnect the device. The drive is multiplatform and you can connect it via USB (USB 2.0 compatible). It is priced at \$200 (approx Rs 10,000).

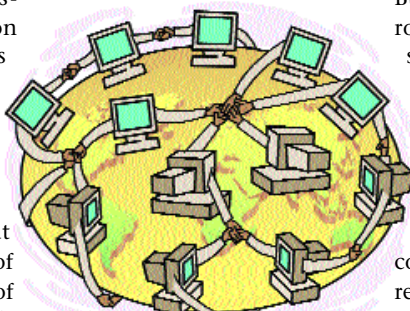


■ Sony to develop cell phone games based on BREW software from Qualcomm ■ E-Ink demos prototype of its flexible computer screens

# New heights in grid computing

Advanced distributed computing touched a new milestone when a grid of computers scattered at several sites in the US successfully carried out a simulation of 50,000 proton collisions as a part of the Compact Muon Solenoid Collaboration experiment. The test involved linking up systems located at Caltech, Fermilab, the University of California at San Diego, the University of Florida and the University of Wisconsin by means of a high-speed Internet connection. The success of this simulation

is important because the scientific exploration's need for computing power far outstrips what is currently available.



Globus Project and The Condor Project provided the software required to link the five

sites. The software of both these entities are open source and support Windows, Linux and all major flavours of Unix. But there are bumps on the road that have yet to be smoothed out. For instance, the heterogeneous nature of computers on the grid has to be dealt with. Besides, error recovery on a distributed system can prove to be a convoluted task. By year's end, researchers in the field of grid computing hope to widen the grid to 20 sites spanning the US and Europe.

## Trespassing on the Xbox

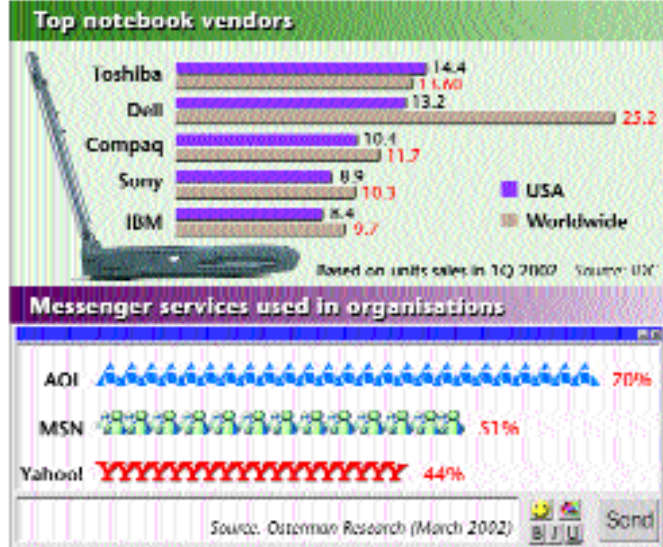
Last month saw the sale of the Xtender, a 'mod chip' that allows you to play illegally copied games on the Xbox. Customers are promised the ability to play games copied on recordable CDs and DVD discs and watch DVD movies otherwise protected by software from Macrovision. The Xtender needs to be added to the main

circuit board of the Xbox, but this is no mean feat as you need to solder it at more than 20 different spots!

Copy-protection software built into all Xbox games makes its discs unreadable on PCs. So far, only a few hacker groups have laid claim to breaking through the protection, leading to illegal game files being

traded over the Internet. Interest in these mod chips has been strongest from Europe because gamers there would no longer have to wait for six months for a PAL version (the European video standard) of the latest US game titles. While the main purpose for the mod chips is to facilitate illegal software copying, they may also be a boon to the elite hackers looking to add new software functions to the Xbox such as MP3 playback and for running emulators to play games written for older systems.

## statattack



INFOGRAPHICS: Jaya Shetty

## snapshot

Worldwide SMS messages to grow to **146 million** in 2002 from **102.9 billion** in 2001 and to **168 million** in 2003!

Source: Gartner Dataquest



## heroes

### Blue no more

Sonicblue manages to overturn order requiring it to turn over all information about what TV shows are copied, stored, viewed without commercials or traded using its ReplayTV 4000 DVR to television networks and movie studios suing it for releasing the recording device in the first place.

### Spider-Man to the rescue

Sony's 1Q 2002 revenue was better than expected partly due to its hugely successful movie *Spider-Man*.



## zeroes

### Video piracy

The Tehran-based site [www.Film88.com](http://www.Film88.com), which sold copyrighted films at \$1 per film over the Net, was shut down by the Motion Picture Association of America

### EU's new spam guidelines

The European Parliament's new guidelines for controlling spam require telecom companies and ISPs to retain all traffic data for criminal investigation purposes. This gives the government massive power to collect private data on any EU citizen and at the same time hampers legitimate European marketers while doing little to stem junk e-mail from outside the EU member states.



## tomorrow's technology

# Remote Storage

IBM has launched iBoot, a storage technology that lets PCs and servers use networking to assign a remotely located hard disk as its main storehouse of data. This, the company claims can prove to be economical as using centralised storage instead of internal drives can help companies cut PC maintenance costs, saving on procedures like software upgrades for PCs. iBoot uses the relatively new iSCSI networking standard, which takes advantage of standard Internet Protocol

to create a link between the PC and the remote disk drive. Although it might seem similar to mainframe computing, there are certain essential differences. In the case of an iBoot each PC continues to use its own processor and other hardware, avoiding competition with other machines for shared processing power on a mainframe.

iBoot machines are simply assigned storage space on a specific remote disk, allowing people to maintain their own data. The PC's user continues

to access or store files as if nothing has changed. This technology can be added to existing PCs and the main components are an iSCSI adaptor and a software update.

IBM sees a strong potential for iBoot as manufacturers could soon produce computers with smaller hard drives wherein you need to only temporarily store files and then connect to a networked storage drive. We might witness a reversal in the trend of high-end PCs shipping with 80-120 GB drives.

## Buy one, get one free

In an endeavour to combat slipping sales, Palm has decided to give away an m105 free to those who purchase the higher end m500, priced at \$299 (approx Rs 15,000). Besides spurring sales, Palm hopes this move will increase the spread and usage of their devices by attracting new buyers who might then move on to some of the higher priced models later on.



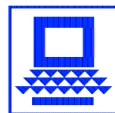
## snapshot

Shipments of Bluetooth devices to grow from less than 15 million in 2002 to 955 million units in 2005

Source: Cahners inStat Group

# Computex Taipei 2002

Trade shows spell excitement, great new products and hot technologies and this year, Comdex Taipei held between June 3 and to June 7 has not disappointed. AMD announced dates on which it is going to release its much-



**COMPUTEX  
TAIPEI 2002**

anticipated K8 processor. nVidia was also present en force with its CK8 chipset (codenamed Crush) which is primarily an NV17-based nForce solution for the Opteron. FIC showcased some interesting technology with its ATi A4-based motherboard which is their answer to the nForce.

ASUS launched a PDA featuring a serious amount of handheld horsepower based on a 400 MHz Intel Xscale processor (PXA259), 64 MB SDRAM, 32 MB FlashROM running Microsoft PocketPC 2002.

Besides the overwhelming presence of the motherboard and processor companies, there were a range of other products incorporating some really cool technologies. This included devices like tablet PCs that could double up as a notebook or desktops where the screen could be attached to a base-station for conventional keyboard/mouse support, to

wireless cameras based upon the 802.11b standard and a range of mice that incorporated CompactFlash and Smart Media readers and biometric functionality.

We know all too well that the last year has been a bit of a letdown economically, but if Computex Taipei 2002 is anything to go by, there is a lot in store on the technology and PC front: 64-bit processors, faster and cheaper graphics cards, motherboards that give you wireless freedom—the next few months should be very interesting indeed.

## quoteworthy

"We are in two businesses which are in the process of converging. Having been through the computer wars, you know what is going to happen, you know what the end point is going to be."

Intel Chief Executive Craig Barrett on his company's plans to make further inroads into the telecommunications chip market, as equipment makers adopt cheaper and standardised components

"We can build more than we thought, we are in the business of selling computers to people who want to buy them and we've got a lot of customers who say they want to buy this product. Why shouldn't we sell it to them? So we decided to change our plan."

Apple CEO Steve Jobs on the shift in its marketing strategy of selling the eMac exclusively to the educational segment to now selling it to anyone

"If you think about it, in the private sector the US government is probably the only consumer on earth that has the power to control Microsoft's market decisions."

James Love of the Consumer Project on Technology (CPT) suggesting the government to outright buy Microsoft's software code and release it in the public domain

■ Hitachi pays \$2.05 billion for IBM's hard drive operations ■ Microsoft considers Xbox-PC connection kit ■ Macromedia ships MX tools

## Pocket burners

Dear Vinit,

Let me first compliment Digit—your anniversary issue is absolutely fabulous!

Your editorial 'Free for All' is also very apt and significant. I believe that software developers themselves are responsible to a large degree for the rampant piracy in India. The legal price of any software should not exceed its actual cost of development, plus a fair and reasonable profit, divided by the number of copies produced by the manufacturer for sale. Anything more is surely a rip-off. Hope software developers will realise that selling more copies at an affordable price will net more revenue than selling a few 'legal' copies at a price that most users cannot really afford.

Rajiv Raje  
Via e-mail

digit

Dear Rajiv,

As we're not used to paying for software, reducing prices will only improve the situation slightly. A tougher stand from the government on piracy is possibly the only deterrent that might compel us to either start paying up for software or to look for legitimate alternatives.

## Hocus focus

Dear Vinit,

Why have you carried a test on cell phones? They have nothing to do with computers! Watches, TVs, refrigerators, all have some computer features, but it doesn't mean that you carry a cover story on them in your 'computer' magazine.

Abhishek Jha  
Via e-mail

digit

Dear Abhishek,

Digit is not just a 'computer' magazine. Digit has evolved from being your guide to computing to your very own technology navigator. Our focus is still on covering traditional computing products such as CPUs, motherboards, sound/video cards, hard drives and printers, but we'll also feature digital technology products that are becoming an indispensable part of our lives, such as digital video cameras, cell phones, handhelds and MP3 players. Who knows, a few years down the line you might even see a test drive on the new human interface systems powering next-generation, fully computerised automobiles in Digit!

## Quote my price

Dear Sir,

I am a regular reader of Digit and find it very interesting. The only thing missing is the current price of computer components. I suggest you include this in your magazine, thereby making Digit even more useful to its readers.

Prajith May  
Via e-mail

Hi Vinit,

I am planning to buy a new computer, but would like your opinion on what the system configuration should be. Please send me your recommendations for buying a basic multimedia PC for Internet browsing along with indicative prices.

Jeby J.  
Via e-mail

digit

Dear Prajith and Jeby,

We receive hundreds of similar mails each month requesting details on the latest prices of components and peripherals along with our recommendations for building and upgrading PCs. Last month we promised to reinstate the A-List in the magazine and in its new avatar, **Config.your.sys** (refer to page 89), we hope to address most of your queries.

## Something for everyone

Hi Vinit,

The GeForce and other high-end video cards get a lot of coverage in Digit, but I think you should show the same spirit in reviewing low-end cards too. Please understand that for a lot of us, the GeForce is still a dream—the most affordable option for 3D graphics remains onboard video cards found on 810 chipset based motherboards.

Sajesh Prakash  
Via e-mail

digit

Hi Sajesh,

The latest video cards feature a tonne of technology innovations that make life easier for content developers and enable rich, true-to-life 3D worlds for consumers. Therefore, it's only natural that you will see a few articles dedicated to demystifying these technology advancements. But our comparison tests cover every end of the products spectrum and the upcoming graphics card test in August 2002 should lay to rest all your fears about us ignoring prevailing market realities.

## Your vote counts

Q. Should we bring back the Software Archive on the CD?

Yes	No	Huh?
80%	6%	14%

Last month's question was a no-brainer. Look out for the software archive in next month's CD.

This month's question:

**"What kind of 30-minute Quick Starts (Workshops) would you prefer?"**

Log on to [www.thinkdigit.com](http://www.thinkdigit.com) and vote on it



## Sharing complaints

Dear Vinit,  
Please start a section for readers' grievances against troublesome computer dealers and frauds. Although there is a 'Panchayat' section in Digit Dialogue, it's not very effective as it only comes once in three months. I am not asking Digit to look into the matter personally, but to provide a forum for our grievances.  
Prateek Kankar  
Via e-mail

digit

Dear Prateek,  
We realise the need for a grievance corner and are working towards implementing an interactive forum on the [thinkdigit.com](http://thinkdigit.com) Web site. Stay tuned to this page for more details in the next few issues.

## Taking a hike?

Dear Vinit,  
I have tried various other magazines and Digit is the only one that I have stuck with for such a long time. I was shocked to see the price of the anniversary issue, but since there were five CDs, I went ahead and splurged on it. I wasn't one bit disappointed but am wondering if you are going to continue with the same price.  
Naveen Roy  
Via e-mail

digit

Dear Naveen,  
Digit will continue to be available at its original price of Rs 100. The anniversary price of Rs 150 was to compensate for the three extra CDs along with the special packaging but our regular subscribers received the five CDs at no additional cost!

## The better half

Dear Sir,  
I tried installing the free Mandrake Linux 8.2 that came with your anniversary issue, but during the installation I was prompted to insert CD 2. How do I install Mandrake without the second CD?  
Nihar  
Via e-mail

digit

Dear Nihar,  
To configure Mandrake as a desktop OS only, select the packages visible in the screenshot. Do not select any other package or check the individual package selection box. If you are still prompted for the second CD, simply click on 'Cancel' and continue with the installation—Mandrake will still be installed with complete desktop functionality.



Select only the visible software packages during the installation process

## Having fun yet?

Hi Vinit,  
The anniversary issue was truly impressive. Thank you very much for carrying those games in the Funzone section. I really loved it and it was a perfect fit for my old PC.  
Srinivasan  
Via e-mail

Dear Editor,  
Congratulations to the Digit team for conjuring up a great anniversary issue. But I'm not at all satisfied with the contents of the Gamestation CD. Only three full-fledged game demos!! I expected a lot more. The CD is crammed with unnecessary add-ons and arcade games. Please consider including more demos in the future.  
Debraj Mondal  
Via e-mail

digit

Dear Srinivasan and Debraj,  
We have received repeated requests for games with low system requirements. The Funzone section has been introduced to cater to all our readers who are not blessed with a 32 MB 3D card, and is here to stay.

## Short Bytes

### Heartfelt wishes

Dear Digit,  
Congratulations on your first anniversary. I am currently working as a faculty member in a private computer institute and Digit keeps me updated on the latest technology and computing innovations. Once again, thanks and congratulations for a job well done!

Sagar A.

Via e-mail

### Fantastic five

Happy Anniversary! I have seen Digit through many milestones, but this anniversary was surely the biggest of them all. I don't think any magazine has ever given away five CDs! Kudos to you all and carry on the good work.

Swapneel Rane

Via e-mail

### Wow!

Hello,  
Thanks for distributing those invaluable five CDs with the anniversary issue. Not only was Digit on the stands by the first of the month, the packaging of the CDs was the best ever!

Arindam Sarkar

Via e-mail

## Goof Ups

The overwhelming success of the anniversary issue led to a lot of heartburn for some of our readers who could not find a copy of the magazine. Guess we should have printed some more copies in the first place.

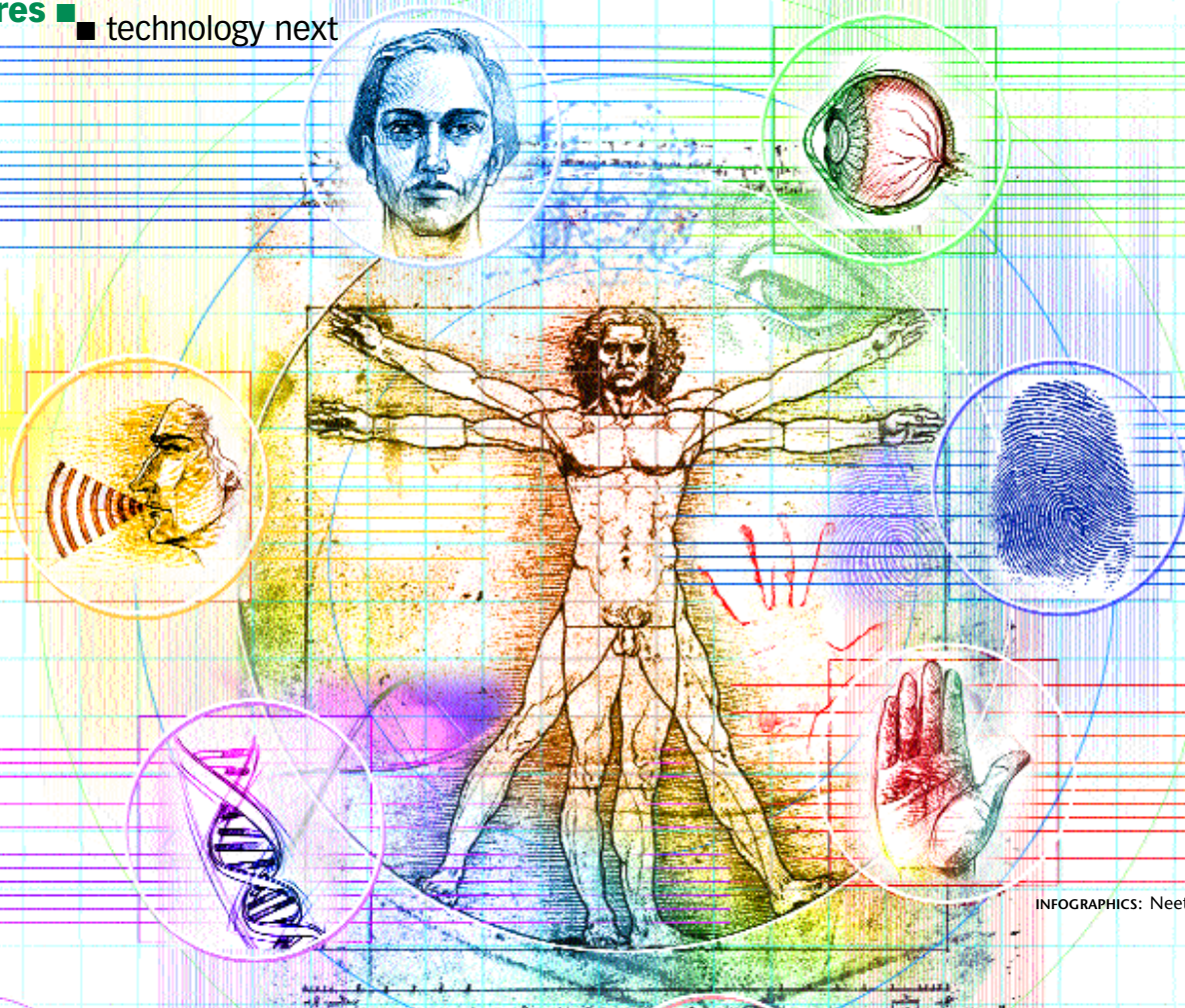
Notice any goof-ups? Write to [goof@jasubhai.com](mailto:goof@jasubhai.com)

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](mailto:readersletters@jasubhai.com)



INFOGRAPHICS: Neeta Wadiker

# Sense and Security

**Passwords have been the means of authentication for too long. Long enough to allow development of virtually thousands of means to bypass security infrastructure. Biometrics promises to change the scene by introducing foolproof security measures. Or does it?**

**W**alking into office, you flash your identification card at the security guard. He engages his face recognition system that identifies you and lets you pass. You later phone your colleague, who engages his voice-identification system to match your voice against an earlier recording, then gives you the information you need. After lunch you mark some bills with your personal bio-identification code and send them to accounts. They use their optical systems to scan your bio-code to clear those bills. In this high security office of the future, biometric systems are the primary means of identity authentication.

This hi-tech, high-security office of the future exists even today. Everyday, the security guard looks at your face and recognises you as an employee, your colleague hears your voice on the phone and knows it's you, and your signature assures people that you approve of what the paper says. Biological systems like us use biometrics everyday to identify each other. Now computers are able to do the same.

This opens up some significant security enhancements in the public space. For example, passports traditionally have a photograph and some identification marks described in them. Replace this with digital biometric data, and biometric security systems at airports could speed

up the checking process many times over, perform more accurate checks, and free up the security personnel for other tasks. Taking this into account, the U.K. government is looking to add fingerprint or iris data to all passports by the year 2006.

But that's not all, you can even have your own personal biometric systems that effectively replaces passwords. All the passwords you'll ever need to remember to use with your computer including login, Internet site passwords or e-mail would be hidden away behind your fingerprint. However, it is important to note that these systems work alongside passwords, not instead of them. You still need a login password for identification to let you access your files if the biometric





system fails. Web sites currently do not record biometrics; the bundled software will send passwords to the site when you are authenticated via biometrics. So the need for strong passwords doesn't go away. There are dozens of such systems available, and all perform with varying levels of success. Devices like the Sony Notebook Camera Kit let you access the PC only if you show your friendly face and the DigitalPersona U.are.U Pro will be happy to see your clean fingers.

### Could it be magic?

Biometrics is essentially the measurement of physiological or behavioural characteristics of a person. It is important to measure biological characteristics that are unique to individuals, difficult to fake, and easy to measure. On this basis, fingerprints, handprints, voice and face top the easy to measure criteria, while iris and retina scans provide the highest level of unique, hard to fake biometrics. These are all physical characteristics of your body, and therefore a part of who you are. You can be reasonably sure (odds of 1 to a million) that you



- Most convenient, great for public places.
- Quite inaccurate. Is affected by changes in lighting, age, posture, movement, glasses, etc.

won't bump into another person with the same characteristics. This is what biometric security banks upon.

Biometrics does not guarantee security. It simply offers a more convenient and reliable means of identification and authentication. Identification is a process of recognition and involves taking the biometric data and searching for a match in the database, making it a slower process that is more prone to errors. Authentication involves confirming your identity, and the biometric system has to match your data with only one, single record.

Some systems measure things you do, in addition to the things you are. When you type your password to login to your computer, you will notice that your typing has a certain pattern to it. Some letters follow others in quick succession, while others take longer. This pattern is almost a ritual that is very closely repeated every time you type, and is also reasonably unique to you. A

## Do I know You?

It is quite easy to procure anyone's fingerprints, so manufacturers take steep measures to ensure that the prints are only scanned from a live finger and not off copies. A Yokohama University professor, Tsutomu Matsumoto recently published his techniques for fooling fingerprint scanners. He found that optical fingerprint scanners can often be fooled by silicone rubber fingers. However, electromagnetic scanners would reject those because their electrical characteristics are different from that of a live finger. He didn't have to look far for a suitable material to simulate a live finger. Jelly sweets, made of gelatine, were found to have just the right electrical properties and a surface that is easy to mould. Sheets of clear gelatine with the fingerprint impressed, wrapped around your finger, would be enough to fool the scanner even in the presence of a security guard. Matsumoto was able to consistently fool eleven commercially available systems 80 per cent of the time. With complete details on transferring prints from any surface to gelatine sheets now publicly available, this

development makes a huge dent in the trustworthiness of fingerprint systems.

In public locations such as banks and airports a large number of people transit every day, including known criminals. Face recognition systems attached to video surveillance systems are supposed to help catch them. Iceland has already installed a face recognition system sold by Visionics to improve security. Theoretically it is an excellent idea, but experiences indicate otherwise. The Visionics system was tested for eight weeks at Palm Beach airport in Florida. From all the people passing by the surveillance systems, it could identify less than half of the 15 people registered with it. It was adversely affected by lighting, movement and people wearing spectacles. Law commentator Henry Miller calls this the 'Clark Kent syndrome'. With spectacles it's Clark Kent, take them off, and you have Superman!

One vendor, FaceKey, says candidly that face recognition is practically useless for general identification, but ideal for individual authentication.

software called BioPassword from Net Nanny, retailing for less than \$100 (approx Rs 5,000), integrates with Windows 2000 and Windows NT login to provide this authentication, without the need for any additional hardware.

Depending upon the technique used, biometrics have varying levels of accuracy. Moreover, since the measurements here are of actual people, there can be no predictability of response. The system might let you pass in one attempt on Monday and require five on Tuesday. Biometric systems are unique in the matter of having False Acceptance Rates (FAR)—the probability of the system falsely accepting a metric as a match, and False Rejection Rates (FRR), where the system fails to recognise an authentic bio-signature. Almost all biometrics systems can be adjusted to varying levels of 'strictness' to create a variation in FAR and FRR. Obviously, as the FRR is increased, the FAR goes down, and vice-versa.

There are no accepted standards for

measuring the accuracy of biometrics on both these criteria, so we often have to rely on manufacturer's own data or the results of studies that often do not agree on the results. Yet, there is a broad consensus on the relative accuracy levels of different biometric techniques. One study sponsored by the British Communications Electronics Security Group last year showed Iris-based identification systems had no false matches in 2.7 million trials, with a false rejection rate of less than 2 per cent in first attempts and zero in three attempts. Face recognition showed false matches of over 10 per cent, and fingerprint systems had false matches of less than 0.5 per cent (see box 'Do I know You').



- Cheap and easy to deploy, convenient for personal use.
- People often lack readable fingerprints, extremely easy to fool.

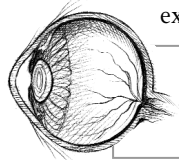
### Common biometrics

The idea of a computer looking at a face and recognising it is inherently enticing. It is the least intrusive method of biometrics. Your face is permanently on display no matter where you go, and



measuring this metric is as simple as taking a picture or analysing the images from a security video camera. A computer analyses the image to locate a 'face' within it, applies algorithms to compensate for factors such as lighting conditions and creates a normalised face image. This

image is then compared with an existing database.



- Extremely accurate with no false matches in more than 2 million.
- Intrusive, expensive, difficult to deploy and use.

One technique called the Facelt algorithm by Visionics works on the assumption that all faces have the same recurring elements that form it. These elements are small and many. The Facelt algorithm catalogues a series of such elements in your face, analysing their occurrence and geometric combinations. The company claims to achieve high levels of accuracy and produce quick search results.

Fingerprinting is a common and well-known biometric. You place your finger on a scanner, which uses either optical or electromagnetic means to take its snapshot. While optics may be obscured by dirt on the finger or stains on the scanner surface, electromagnetic sensors take that in their stride and have the

additional benefit of being able to detect the difference between live and dead fingers by their difference in capacitance. The software analyses your finger for patterns such as loops, whorls and arches. It takes the sampling of ten to fifteen points on your finger and stores that in an encrypted form. Authentication is a simple matter of comparing the finger you

offer with the finger signature stored in the database.

The retinal and iris patterns are quite

unique to individuals, far more so than any biometric yet devised. If you have ever been for 'computerised' eye testing, you have some idea of how this technology interfaces with users. You need to put your face in front of a camera, and align it carefully to a specific position. A low intensity Infrared beam shines through your eye, hitting the inside surface of the retina and warming it up. When warmed up, the blood vessel pattern shows up more clearly. This is also one of the reasons why movies like 'Demolition Man' are a little off-track—you can't rip off someone's eyeball and expect the system to work! The camera takes a snapshot of the retina or iris, and the digitised image is processed by the software. Again, only key points on the retina are stored into the database during enrolment. For authentication, your retinal pattern from these key areas is compared to that stored in the database.

Despite the high degree of reliability, iris and retina scans remain the domains of establishments with extreme security requirements. The scanning process is quite cumbersome and requires significant co-operation by the subject. It is also the most intrusive and works with the eye, an organ that most people are quite sensitive about.



- The only biometric that works over a phone.
- Flummoxed by illness, much easier to spoof than most other biometrics.

### Putting it to use

Fingerprinting is quite convenient to deploy, and is now showing up on an experimental basis in many US supermarkets. Customers are invited to give their credit card information and other personal details to the store, and tie it in with their fingerprint data. The next time,

the customer can pay for purchases with just a fingerprint. Convenience is likely to be the main draw for public biometric systems, but with manufacturers also pushing the accuracy of biometrics, applications with higher security requirements are likely to emerge with ATMs being an obvious candidate.

Deploying fingerprinting in a corporate environment for either employee attendance or as a security measure is also a growing trend. One Indian manufacturer offers fingerprint terminals for just over Rs 60,000, but there are additional costs involved for either a dedicated computer or Rs 20,000 for a controller. Electronic locks that can be operated by such a device are sold for Rs 4,000 and you also need to factor in the cost of installation and training for all employees who must use the system.

Fingerprint scanners for personal computing devices are commonly available for \$100 to \$150 (between Rs 5,000 to Rs 7,500) with bundled software. Though simple pads like the Sony FIU-710 are common, they come in many different form factors. Some laptops, like Toshiba's 8200 series, can use PC Card fingerprint readers to provide BIOS level security. The Biolink U-Match Mouse has a thumb scanner located at the thumb rest area of the mouse.

### The final word

Biometrics are going to be on a terminal near you soon enough, but should you blindly trust them? Not really. The propaganda on biometrics would have you believe that it is the definitive answer. Don't.

Security is not just about putting big locks on the front door, it also involves making sure all the windows are shut. As a security paranoiac, you will have to use multiple layers of security that include biometrics, smart cards and even the commonplace measure of passwords. Each one can be individually fooled or bypassed, but the combination makes

the system more secure as a whole. Biometric data must reside on the same kind of servers and networks that are hacked every day. If credit card numbers can be stolen, why not biometric signatures?

Yet, no matter what the security issues, biometrics systems do make ultra cool gizmos. ■

SUMOD HAJELA

## Online Resources

### Sans Institute Reading Room

A selection of articles explaining how biometrics works and how it can be integrated into a security framework.

<http://rr.sans.org/>

### Biometric Consortium

A US Government site dedicated to biometrics and its applications.

[www.biometrics.org/html/examples.html](http://www.biometrics.org/html/examples.html)

### BioPrivacy Initiative

Analysis of privacy risk factors from biometrics, and guidelines on proper usage of the technology.

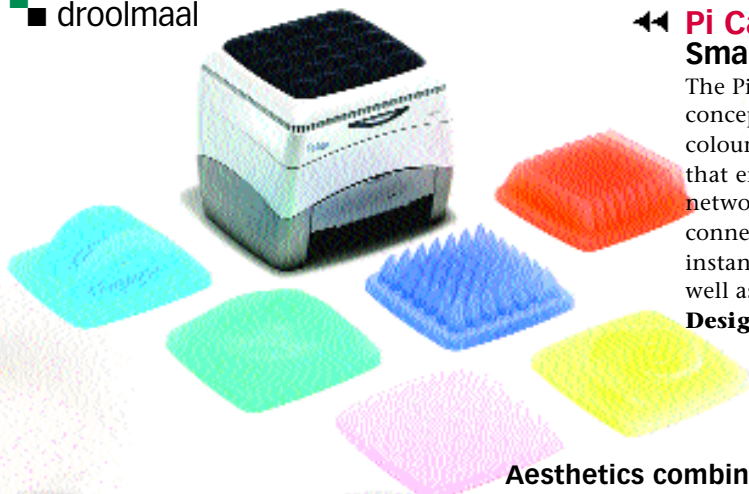
[www.bioprivacy.org](http://www.bioprivacy.org)

### ACLU

A site dedicated to civil liberty. While it is completely American in focus, it deals with issues we will face with public deployment and over-reliance on biometrics in the coming years.

<http://aclu.org/>





#### ◀◀ **Pi Casa** **Small and colourful**

The Pi Casa is a powerful, small form-factor concept PC with seven interchangeable pastel colour tops. It has built-in wireless technology that enables it to act as a 'satellite' for the networked home PC environment. When connected to the home server, Pi Casa enables instant and seamless access to the Internet as well as any Net-enabled electronic devices.

**Designed by: SOZO Design**

**Aesthetics combined with untamed power!  
Served up are some ultra-futuristic concept  
PCs to get you slobbering on the floor**

# PC haute couture



#### ◀◀ **Vesta** **Your kitchen mate**

A PC for the kitchen? Why not? The Vesta is designed to be the ultimate home manager. It can monitor your kitchen appliances and shopping lists, besides checking e-mail and voice mail. Powered by a Pentium III processor, the Vesta is voice activated and features a touch screen panel. All you have to do is rattle off the grocery list and it'll place an order with the neighbourhood grocery store, or dictate mails while you whip up a smoking hot pizza!

**Designed by: Anderson Velocity**

**PRO FX A/V Recievers, with  
technology from Denon.  
For the ultimate  
Home Theatre experience.**



AVR-3802



AVR-2802



## The Concept PC ▶▶ Hi-tech sophistication

The Concept PC fits almost anywhere—it can be positioned on a rotating arm or hung upon a wall like a mural. It boasts of an 18-inch LCD panel with a wireless keyboard and mouse. Powered by a

Pentium 4 processor, it has an ultra sleek 2.5-inch 48 GB hard disk drive and a slim slot Panasonic CD-RW drive. With a Web cam built on the monitor chassis and integrated speakers, what more could you wish for?

**Designed by: HP**



## ◀◀ N' Touch Your passport to the Internet

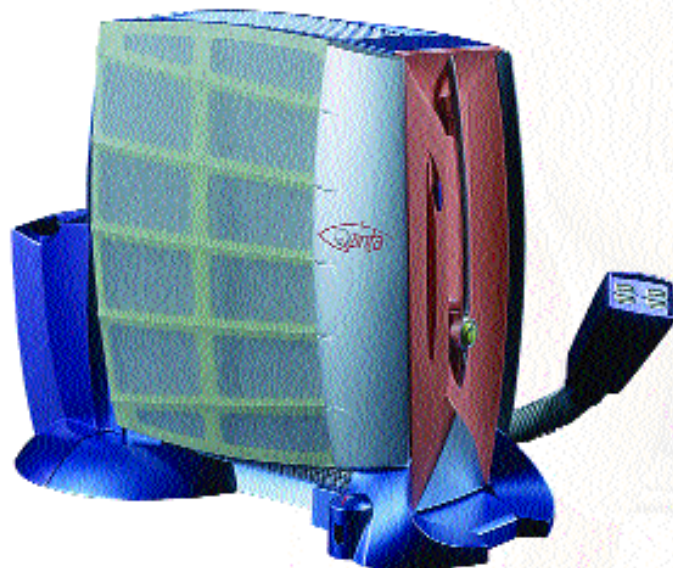
The slick and trendy N' Touch uses the Intel Anypoint wireless networking solution to integrate seamlessly with other wireless PCs and devices. Using 802.11b technology, you can create an 11 Mbps wireless network for up to 10 PCs. You can access resources on other PCs from up to 300 feet away through walls and floors. The N' Touch works not only as a regular PC but also as a wireless passport to the Internet—it allows you to share your Net connection with other PCs.

**Designed by: Engineering Design Consultants**

## Gozinta ▶▶ All-in-one wonder

The Gozinta is a funky, high-performance graphics workstation. Powered by a Pentium III processor, it has eight onboard USB ports, a 1394 FireWire port and a four-port USB hub on a flexible extension—all of which allows you to swap external devices in a jiffy. This concept PC packs enough power to serve as your home's interface to the Internet and can double up as a digital video centre. It's ideal for quickly downloading, editing and sharing digital video/still images from any USB digital camera.

**Designed by: Anderson Velocity**



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ADVANCED AUDIO IMAGING SYSTEMS

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PRO FX range of  
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**AVR - 3802**

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AVR-1802

Home Theatre · Hi-fi · Professional Audio



AVR-1802

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# @eek-MAIL

## 10 e-mail disasters to avoid

A slip of a click is all it takes for that e-mail to turn back and hit you where it hurts the most. Here are some of the most mortifying e-mail blunders that we could dig up and the precautions you can take to avoid embarrassment. All personal names have been omitted or changed to protect the embarrassed.

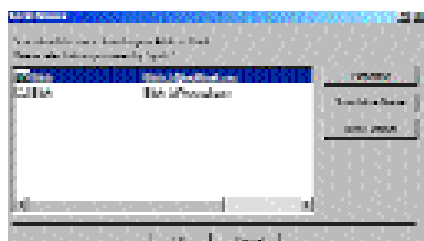
### 1 Buddy who?

Many e-mail clients allow you to specify nicknames or use the autocomplete feature to fill in the e-mail address. But what if you have two people with the same name in your address book? Or if the person has two e-mail IDs and you accidentally send a mail to the ID that he doesn't check too often? Many e-mail programs even add the default domain name of your ISP if you don't specify the full e-mail address and if a match isn't present in the address book.

This can cause you no little embarrassment, as Mr Dude-at-large found out the hard way. He wanted tips on impressing the girls at the office party from a friend, all through e-mail. Little did he realise that the mail addressed to buddy@somewebmail.com was actually sent off to his supervisor, buddy@company.com.



**Workaround:** Double-check the 'To:' field before you send a mail. You can use the shortcut [Ctrl] + [K] to check the exact e-mail address



*If you aren't careful, you can end up sending the e-mail to the wrong person with the same name*

of all those you've added to the 'To:' field. Or better still, keep 'Autocomplete' off. In Outlook Express, select **Tools > Options > Send**. Here unselect the checkbox 'Automatically complete e-mail addresses when composing'.

### 2 For all to see

The sins of the 'Reply All' button are quite common—we see examples of it every day. Some manager sends an e-mail to everybody announcing a promotion in the office and then people start sending congratulatory messages to the promotee, and all mails are sent Reply All. So everybody in the mailing list gets to know how Mr Sharma is delighted to welcome Mr Singh in the team and how Mr Gupta agrees with Mr Sharma that Mr Gupta will indeed be a great asset to the team.



*Having the 'Reply All' button next to 'Reply' is the perfect recipe for disaster*

Now this kind of e-mail would rate as a minor irritant. We can live with that. But there is every chance that an indiscriminate use of the 'Reply All' button could lead to an embarrassing situation.

One of the most embarrassing incidents we know of is when this client mailed a change in project requirements to the people working on his project. Miffed at the change in plan, which would require working to a tighter deadline, one team member sent a detailed mail to her colleague cribbing about the whole deal and what exactly she thought about the client. Soon there was mail flying back and forth with snide comments about the client and the project. Little did the two realise that all this while they'd been sending the mail Reply All. Needless to say, the company lost that account and the two ladies just about managed to save their job.



**Workaround:** Remove the 'Reply All' button from the layout. This will ensure that you use it only when you want it. Right-click on the taskbar and then click on 'Customize'. In the window that comes up, click on 'Reply All' in the right pane and then click on 'Remove'. Now click 'Apply' and you are safe.

Also, watch your To's and CC's when replying to mail. Don't continue to include people if the message becomes a private conversation.

### 3 Looking high and low...

Admin-All has a similar potential to go awry as the deadly 'Reply All' button. One of the worst incidents we witnessed was of a person who misplaced his screwdriver and shot off an e-mail asking the unknown person who had borrowed it, to return it. The catch was that instead of clicking on Admin-Local, he clicked on Admin-All and the e-mail was sent to over 200 people, including the branch offices across India! For weeks afterwards our hero received mail about the likely adventures that the truant screwdriver could be having.

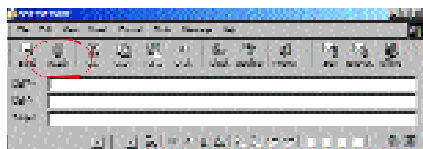
On a more serious note, the Admin-All feature has great potential for misuse. Disgruntled employees can and do use it to vent spleen about management policies, which can be demoralising for the rest of the team.



**Workaround:** It is much wiser to simply disable Admin-All from the address book. Sure, one can still send mail to everyone in the office, but the chances are much less if one has to manually enter each address in the 'To:' field.

## 4 Gaffes with attachments

We've all had incidents where we've sent a mail with an attachment, only to send a second mail, sheepishly acknowledging that we'd 'forgotten' to attach the file with the first mail.



*Make the 'Attach' icon more prominent so you don't forget to attach the file*

Or take the case of this friendly soul, who ended up clogging the mail server when he sent a 10 MB anti-virus program as an attachment to Admin-All. There were some 200 addresses in the list and the server had to generate the attached file for each address. You can do the maths. A waste of bandwidth and time for everybody!

Another example of how attachments can cause a fair amount of heartburn is when you have to download a beautifully formatted document, only to find that the information didn't need to be dressed up with fancy fonts and colours and could very well have been included in the body of the e-mail itself! Forcing someone to download a 100 KB message to read 2 KB of content, especially over a dial-up connection is more than just irritating.



**Workaround:** Make the 'Attach' icon more prominent in your e-mail client. Right-click the toolbar and click 'Customize'. Now move the 'Attach' icon upwards till it is next to the 'Send' icon on your toolbar. You can also choose 'Show text labels' and 'Large icons' from the 'Text Options' and the 'Icon Options' drop down list, respectively.

Always check the attached file before sending the mail to ensure that you have attached the right file. If your attachment is larger than 100 KB, be kind to the poor chap who'll be downloading it over a dial-up connection and use a compression utility to zip the file.

## 5 Exposed addresses

It's very easy to send mass e-mails to everyone on the mailing list, but would you want everyone to know who you've sent the mail to? There is no dearth of horror stories of mass e-mails where all the addresses are available to everybody.

Our favourite story is the one where Mr Do-it-all-in-one-shot sent his resume to 10 prospective employers with everyone on the CC list. The damage? He was applying for a middle-level marketing position and he was branded as too clumsy to be relied on to maintain client confidentiality. Needless to say, none of the companies got back to him.



**Workaround:** It pays to keep in mind certain fundamentals about addressing e-mail:

**The 'To:' field:** These are the people the e-mail is meant for.

and 'CC:' recipients. This ensures that those you've sent or CC'd the mail to cannot reply to anyone listed in this field. Putting all addresses in the 'BCC:' field is also a great way to ensure that the recipients of the mail will be able to reply only to you. The other advantage is that you won't accidentally be sending off a ready-made list of e-mail addresses that somebody can use for sending spam.

To use 'BCC:', create a group and while e-mailing, send a BCC to the group with your own address in the 'To:' field. To create a group, click on *Address Book > New* and select 'New Group' from the drop down list. Type in the group name and click on 'Select Members'. Now add the addresses you want to the group by selecting the addresses from the left pane and clicking 'Select'. Repeat till you have added everyone you want to the group. Then click 'OK'.

## 6 Check that forward

Everybody forwards jokes, chain letters, pictures, etc, but what are you forwarding and to whom? Accidentally forwarding a bunch of risqué cartoons and jokes to a special mailing list consisting of your top clients is not quite the right path to career advancement. Also you never know who will find your e-mail funny or interesting enough to forward it on and it's quite possible

that your mail might end up reaching a total stranger's mailbox. There's this infamous story about a woman at Oracle who sent out a bio-data of all her eligible girl friends. The mail was sent to certain eligible bachelors in the office and the purpose was to get dates for her friends for the office Christmas party. This mail did the rounds of the company and finally reached Larry Ellison. Of course, Larry was not too amused about it.



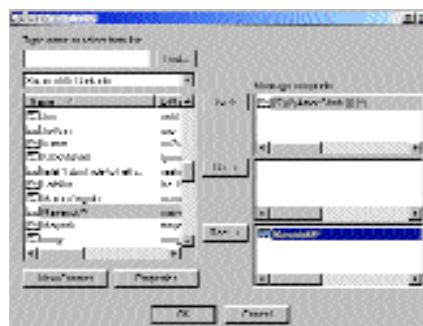
**Workaround:** There's no sure fire method of preventing your mail from being forwarded to an unknown person, but here's what you can do. Be extremely wary of sending risqué mails to just about any person you know. Make a special group of close friends and send and forward such mails to only these people.

## When e-mail comes back to haunt

You've pressed [Shift] + [Delete] and you think that's the end of that compromising e-mail. But it's not that easy to 'kill' e-mail. It could be sitting on your office system server or stored as backup on CDs and DAT tapes. And if someone knows what they are looking for, it would take only a minute for a computer to sort through all the stored messages to find that single incriminating phrase. This is exactly what happened in the Microsoft anti-trust case. The US government was able to get its hands on megabytes of e-mail messages dating from the early 1990s, and Bill Gates's personal e-mail became an exhibit against him.

**The 'CC:' field:** These are the people you want to keep in the loop of things, but you don't expect them to act on it or respond.

**The 'BCC:' field:** This is where you put in the addresses of those you want to send the mail to, without revealing their names to the 'To:'



*Adding the recipients of your mail to the 'BCC:' field is a great way to ensure that they can only reply back to you*



## 7 Mailing lists

Mailing lists are wonderful things when they work well and almost everyone subscribes to one on the Internet. But a poorly designed mailing list can make the sender and the sender's company look like amateurs and even lead to more serious issues.

Take the case of the drug manufacturing giant Eli Lilly, which made the headlines last year when it accidentally revealed the names of 600 users of its prescription drugs to other users. The company had set up an e-mail service to send reminder messages to individual users taking its drugs for serious diseases. In June last year, Lilly shut down the reminder service and sent a message to all the users informing them of this. However, confidential patient information was released when the sender put all the patients' names in the 'To:' field. Not only did the company get a lot of bad press, but also matters were made worse when the American Civil Liberties Union asked the US Federal Trade Commission to investigate.



**Workaround:** Use specialised mailing list software, even for what seem like one-time bulk messages. All mailing list software allow one-way lists; this will help prevent recipients from seeing each other's addresses and responses.

## 8 Set up a group

Take the case of this assistant who sent out a proposal, complete with quotation, to a client with a CC to everybody who'd been working on that client's account. The bloopers? Included in the CC was an ex-colleague who now worked for a rival firm. So now the competition knew who their clients were and how much to charge!

This is a common mistake most people make while using groups—they forget to check whether all the addresses in the list are relevant or not. So many times e-mails are blithely sent to a group which is never updated and mail continues to go to people who've left or are no longer working on that project.



**Workaround:** Check the 'To:' Field. Check groups on a regular basis and update the entries.

## HOW TO WRITE ERROR-FREE E-MAIL

**Rule 1:** Always check the 'To:' field before you click 'Send'.

**Rule 2:** Don't be hasty in clicking on 'Send'. Put the e-mail aside and then reread it after sometime. This will help you tone down the message if you've written the mail in an angry mood, and weed out any inappropriate content.

**Rule 3:** Save your draft e-mail on a floppy or even as a word file on your hard drive. It is very easy to accidentally send an e-mail you are still working on if it is saved in the Drafts

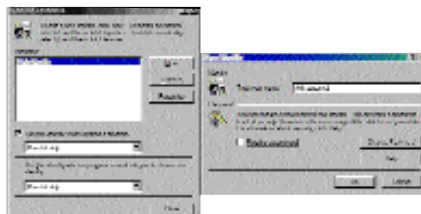
folder in Outlook Express.

**Rule 4:** Think before you commit anything to electronic mail. That joke or off-the-cuff remark about a colleague could come back and hit you in the face when you least expect it.

**Rule 5:** Don't say on e-mail what you wouldn't say in person. It is very easy to misconstrue comments in an e-mail message. The reader cannot see your body language, or hear the tone of your voice to judge whether you mean that comment as a joke or as a caustic remark.

## 9 All accounted for?

We all check personal e-mail from the office and might even use our office e-mail IDs for sending personal mails. After all, it's more convenient to access all your mail from one place. We know of an aspiring designer who wanted to earn some extra money by moonlighting as a freelancer. But he started using the e-mail system in the office to correspond with his client. The only problem was that the day he was away to work on his freelance assignment, his boss went through his e-mail account in search of some information relating to another project he was



Create multiple identities to avoid confusion

working on. Needless to say, he now devotes all his time to freelancing.

Confusion could also follow when you start giving out your personal account for official mail because the office mail server is temporarily on the blink. Before you realise it, your personal account is the repository of all your office information. You leave office and continue to get mail in your personal account. Also consider the amount of amusement you would cause if by mistake you end up sending a mail to your associate in the branch office from an address that reads mrsexycool@hotmail.com!



**Workaround:** Use different identities for office and personal accounts.

To set up a new mail identity in Outlook Express click on **File > Identities > Add New Identity** and type the name for your new identity. Now click 'Yes' to switch over to your new identity. You will be prompted to enter your screen name and e-mail address details. After you are done with that, click on **File > Identities > Manage Identities**. Select the new Identity you've set up for your personal mail and click on 'Properties'. Now tick 'Ask me for a password when I start' and enter a password. Your e-mail client will now ask you for a password whenever you want to use this identity. You can switch between your two identities by clicking on **File > Switch Identity**.

## 10 Watch what you delete

And finally we come to the mother of all blunders, the most irredeemable goof that we could possibly do. Yes, you guessed it, it's when we delete an e-mail or mailbox folder only to realise that we've accidentally wiped clean something important and there's no way to get it back from the nether space of our hard disk. Well, it happens to the best of us, but that's not going to stop us from shouting out "LOSER"!



**Workaround:** Look before you click to delete and name the subfolders in your Inbox intelligently so that there is little room for error.

You can prevent Outlook Express from cleaning up your Deleted Items folder by going to **Tools > Options > Maintenance** and deselecting the 'Empty messages from Deleted Items on exit' tick box.

SVETA BASRAON

# Help!



**Often, during the life of your PC, there comes a time when you will throw up your hands and scream**

talking about her debacle with Linux. Computers were never designed as a consumer product, but with e-mail and the Internet becoming a necessity, they have become an indispensable part of domestic life.

No other consumer product requires hands-on maintenance and support like the PC. Take hardware that goes obsolete sooner than Viva's latest single, a disreputable operating system, bug ridden software, driver updates, software patches, virus attacks, ISP problems, and you have a recipe for disaster. When consumers expect a computer to work like a toaster or a washing machine, there is bound to be computer rage. Computer rage is induced by a lot of things like problematic software and hardware, confusing interfaces, virus attacks, or just plain ignorance. "I've never been a whiz with computers. In

fact, they intimidate me. How am I supposed to know why my computer isn't taking printouts?" says Kavita Jayakumar, mentioning a recent glitch between her computer and printer.

## Send for backup now!

So what do you do when your computer throws a tantrum you can't handle? Service support engineer Sampath Iyengar has a simple answer: "Call for technical support. If your PC is under warranty, use it. Most branded PCs carry a one to three-year warranty. All you have to do is contact your reseller and ask him to send a technician, or guide you on the phone. You can be assured that your computer will soon be in order."

Buying a branded PC does have certain benefits, like authorised service centers and system service providers in every major city. Compaq India has a support centre in Mumbai called 'Compaq

**W**hat do you do when your hard drive crashes and all your data is lost? Or when your machine reboots time and again for no apparent reason? Hitting your head on the wall is not going to help! The most frustrating situation is when your computer won't boot at all, leaving you completely helpless. Equally annoying are error messages you constantly run into during your computer's startup process.

## Rage against the machine

There's a Civil War brewing between the technology literate and the illiterate, and the divide is only widening. "GUI might as well mean Ghee Under Iowa to my illiterate self; I haven't learnt any special *fundas* from some course!" chats Supriya Nair,

## Before you Call in the Experts

- ✓ **Check the power supply:** Always check your cables and power plug. Most technical support calls are resolved with this simple reminder.
- ✓ **Record your error messages:** Keep a journal to write down the error message as you see it, complete with the special characters, etc. Accurate information highly increases your chances for a fast solution.
- ✓ **Record your actions when the problem occurred:** Think back to what you were attempting to do when your system stopped working. What may seem like trivial informa-

tion might turn out to be very significant for the technician.

✓ **Back up your entire system often:** One common solution to many a difficult situation is to reformat the hard drive by totally clearing it and reinstalling everything from scratch.

✓ **Store your program and driver disks in one place:** Keep all your original program CDs and floppies, including your original operating system disks, in an easily accessible place. If you have updated your system, copy each updated file on to its own labelled floppy disk and place it in the same box.



## Help Online

The 'Support' section of your manufacturer's Web site can be a great source of comfort. Many sites offer comprehensive and even interactive support. You can even seek help from other independent sites where experts are more than glad to solve your PC-related woes.

### Microsoft Help and Support

Queries related to Windows can be asked at the Microsoft global product support site, where the support section provides access to a searchable knowledge base, software and hardware FAQs, the latest patches and updates, apart from online support requests.

<http://support.microsoft.com>

### Ask-a-Tech

Just post a question on this site and one of the site volunteers will e-mail you an answer. There is also a bulletin board where you can post a question and separate forums are provided for hardware, software, Microsoft products, Linux and Internet related queries.

[www.ask-a-tech.org](http://www.ask-a-tech.org)

### AskMe

AskMe pairs experts and novices to answer and ask questions. The computer forums are quite active and you can get answers to your questions within a few hours.

[www.askme.com](http://www.askme.com)

### Experts Exchange

A huge community of IT professionals offer free consultation on a wide variety of topics, from programming to networking on this site. There's also a search engine facility for scouring past questions.

[www.experts-exchange.com](http://www.experts-exchange.com)

### Tech Guy

This site has a very active forum, which covers a good range of subjects. The best way to get a solution is to search past posts, where you are bound to find someone who has dealt with your crisis before.

<http://forums.techguy.org>

### Windows Annoyances

This site has won various awards for its unique Windows-related troubleshooting articles and features. It has unique tips and tweaks to get your PC singing.

[www.annoyances.org](http://www.annoyances.org)

On-Call', where technically trained staff receive customer calls and resolve queries over the phone for the entire range of Compaq products.

According to Sampath, 80 per cent of PC-related woes stem from Internet connectivity, OS problems and virus attacks. His tech support centre, called Sam 7, is based in south Mumbai and services an average of 50 calls a day. "IBM and Dell have a huge call centre network, but all these calls are strictly hardware calls and there is no software support except for Windows. Our company scores by servicing operating system, networking and virus-related calls."

If your computer is not under any warranty or an annual maintenance contract (AMC), try taking it to a local repair shop or support service centre around your area.

You can even search for freelance help by going through the classifieds in the newspaper. PC Doctor, a team of certified professionals based in Mumbai, Pune and Bangalore, provide on-site troubleshooting services for a reasonable price of Rs 375 per visit. Other similar services charge an average of Rs 250 to Rs 400 per visit. Good freelance help may be hard to find, but there's always someone who knows someone who is very good with the PC.

If you are really concerned about your computer and use it for a home-based business or a small company, then it is advisable to get an extended warranty or AMC. A comprehensive AMC would cover all hardware and software problems and would guarantee replacement in case of a component malfunction. A cheaper, non-comprehensive contract would only cover all your software related issues.

## Post disaster measures

A hard drive crash can be crippling, as in the case of Jayant, who runs a SoHo (Small office/Home office) business called Om Investments, based in Mumbai. All his valuable office data, e-mails and contacts were lost when his hard drive crashed. Fortunately for him, it was a logical error and all the data was recovered.

Manoj Dhingra, Technical Director of Stellar Information Systems, a company specialising in hard drive data recovery, spoke about the nature of problems

experienced by users. According to him, logical crashes account for 85 per cent of the total hard drive crashes, 13 per cent are due to physical crashes and the remaining 2 per cent are considered natural disasters.

"It is difficult to estimate the life of any hard drive, but hard drives made before 1995 have a longer life than the ones found in the market nowadays. Which is why backing up your data is really important," says Manoj.

## Help yourself

While most vendors help you with hardware and component level problems, there are many problems that they can't fix at the software level. This is when every PC-owner has to do some personal R&D, mess with the BIOS settings, tweak the system, and get their hands dirty.



Sampath Iyengar  
PROPRIETOR, SAM 7

“Since we aren't a branded service centre, our success depends on word-of-mouth and customer references, which are stronger than cold calls”

Simply downloading the latest drivers for your hardware and installing them can fix a lot of things. It's a good idea to update and install the latest patches for your operating system regularly, as is checking the manufacturer's site for FAQs and troubleshooting advice. Sometimes a new software that seems unrelated to the problem could have caused the crash to begin with. Read the manual that comes with your motherboard thoroughly for issues and incompatibilities with the rest of your system. A BIOS setting or just a faulty connection might be the culprit. Check all the connections (IDE cables, printer cables, phone cords); by doing this you may fix the problem by fixing a bad connection.

You can fix many bugs all by yourself and though troubleshooting a computer can be a real nightmare, it's not rocket science! Best of all, it's a confidence boosting experience, and once you get it right, you'll be able to get your PC up and running on your own, ever after. In the meantime, don't feel shy to ask the right people for help!

SRIRAM SHARMA

# How we Test



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.

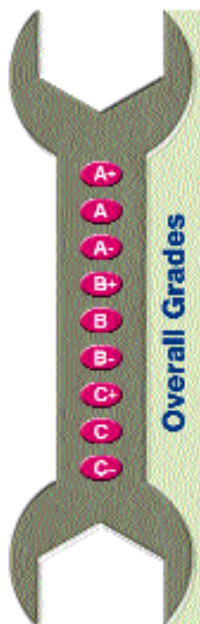
## Comparison Tests

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 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!

## The 5-point Rating System used in Bazaar

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

## In Test this Month

This month brings together 22 of the best inkjet printers, vying for top honours in printing prowess. In this comparison, besides pure performance, we also bring you the cost of owning the printers by factoring in the print life of the cartridges, coupled with the cost of the consumables. So now you can own the best and also the most economical printer available in the market.

To give you a complete imaging solution, we also test 17 hot digital cameras. The prices of these devices have fallen over the last year even as they scale up on the technology front with a host of new features such as longer battery lives, higher resolutions, more intuitive controls, powerful zoom capabilities, more sensitive CCDs and advanced onboard imaging electronics. Go ahead and find out which digicam will keep your shutter finger happy.

Ever had a problem deciding which HTML editor is best suited to your needs? Our showdown between Macromedia Dreamweaver MX and Adobe GoLive 6.0 stacks the pros and cons of these kings of the Web authoring arena.

The Bazaar section showcases a range of interesting hardware, from a cool MP3 player that works in any tape deck, to a device that spells the new generation of optical data storage—a DVD-RAM drive, along with a portable 20 GB USB 2.0 external hard disk drive, and a range of other cutting-edge products.



# *It's like*



PHOTOGRAPH: Mexy Xavier IMAGING: Neeta Wadiker



# Printing MONEY!

**Inkjets offer excellent print quality at affordable prices. But there is a caveat: the hidden costs of ownership can end up costing you a lot in the long run. We test 22 inkjet printers to find which offers you the right combination of speed, quality and cost per page**

**T**he utopia of a paperless office is far from becoming a reality. Ironically, the invasion of computers and digital technology has resulted in just the opposite—more paper than less. And since you cannot avoid printouts—whether it is the quarterly sales reports or that recipe you downloaded from the Net or your child's school project assignment—you might as well give in and get an inexpensive and handy printer that lets you print all those documents without burning a hole in your pocket.

And if you want the option of reasonable quality of output in your colour and black and white prints without having to shell out serious money, then an inkjet printer is the route to go. Once relegated to homes for occasional use, the prices of inkjet printers have been falling over the last few years, even as quality in terms of resolutions (dots per inch) improve. Another improvement is that almost all printers now support a USB interface, which makes printing much faster and installation simpler. Though a laser printer will still give you faster and much better quality prints, the big advantage with inkjets is their low initial cost. You can get a good inkjet printer for as low as Rs 3,000, whereas even the cheapest colour laser printer would cost you nothing less than Rs 30,000.

But there's a catch. While an inkjet printer costs much less initially, and serves as an 'all-rounder' printer capable of printing text and colour images, the operational cost can be quite high. The cost of consumables (ink cartridges and special papers) can add up to quite a bit in the long term.

In this test we've compared some of the best offerings by different vendors across several categories. We've tested them for performance and for cost of operation, so you can pick the most economical printer to serve your needs.

## Digit Test Process

### Qualification criteria

The printers in this comparison were categorised as:

■ **Budget printers (up to Rs 6,000):** These are entry-level printers that offer reasonable quality but are rather slow while taking colour prints.

■ **Mid-range printers (Rs 6,001 to Rs 12,000):** These are much faster with text and colour printing and have support for higher resolutions.

■ **High-end printers (upwards of Rs 12,000):** These feature ultra fast printing speeds and support for A3 size printing (selective printers).

Our test bed consisted of a Pentium 4 2.2 GHz machine with 256 MB RDRAM and a 20 GB Seagate Barracuda drive. Since the performance of a printer can be affected by the connectivity interface, we configured the parallel port to operate using the ECP+EPP mode (Enhanced Parallel Port/Enhanced Capability Port) which is a standard signalling method for bi-directional parallel communication between a computer and peripheral devices. The USB ports were also enabled on the test bed for printers that featured this interface. We tested each printer on a fresh installation of Windows 2000 Professional to avoid interference with older drivers.

### Test methodology

Besides our standard set of parameters such as features (25 per cent weightage), performance (25 per cent), value for money (20 per cent), and warranty (10 per cent), we also tested the printers for total cost of ownership (20 per cent). This is the first time in India that inkjets have been tested for this parameter.

**Features:** We awarded points depending on the features and capabilities of the printer. These included the printing resolution, maximum paper width supported, connectivity interface to the computer, indicators for



troubleshooting, input buffers for speedier printing, the manuals and documentation provided, along with other accessories such as a bundled data cable, specialised paper and software. We also checked for miscellaneous features such as support for dual-sided printing, printing on iron-on transfers, photo printing support and transparency printing.

**Performance:** We evaluated performance on two basic criteria: a) **Printing speed:** We used a sample document file with 25 per cent text coverage and logged the time taken to print this in black and white mode. We used ordinary paper and the print mode was set at normal. We used a colour photograph for the colour speed test. We logged the time taken to print this in best quality mode on coated photo-quality inkjet paper and to print it in greyscale mode (normal print quality mode) on ordinary paper. b) **Print quality:** The first document we used to test the print quality was a combination of text, vector graphics and photos. We observed specific portions of this combi document to evaluate certain characteristics of the printer (see image below). The second print was of a photograph, the same one used for the speed test, which was used to evaluate the ability of the printer to handle variations in colour, hue and brightness. It also had

many fine details and specular effects that would bring out the printing capability of the printer. This full colour photograph was printed in best quality mode, on a coated inkjet paper. To test the quality of text printing, we used a text printout which was divided into four zones. Each zone was observed for flaws such as smudging, smearing, jaggedness, misaligned text, faded text, crispness and depth of blackness. Each zone was also examined for repeatability of the errors and points were then awarded suitably.

**Cost of ownership (cost per page):** Inkjets drink up ink really fast. For instance, a cartridge that costs you Rs 1,000 could end up having a capacity of not more than a couple of hundred pages. Hence, over a year you could run up quite a huge bill in just replenishing the ink cartridges. This is why the cost of ownership should be an important consideration when buying an inkjet printer.

We analysed the long-term costs associated with printers by running a special cartridge drain test. This test evaluates the cost per page for printing colour graphics as well as for printing black text. We first installed a new ink cartridge and printed two documents over and over again till all the ink was used up, or till the printer refused to continue. The first document was created in Photoshop and was composed of alternating groups of cyan, magenta and yellow bars with no blank spaces in between. The entire print area was covered by these bars, with each bar covering 33 per cent of the print area. This was the CMY drain test. The second document had 90 per cent pure black bars and 10 per cent blank space. This was the drain test for the black (K) cartridge.

The cost of ownership test yields two cost-per-page numbers, one for the text-based documents (the black ink cartridge) and one for graphics-heavy prints (the colour ink cartridge).

But most documents that people print, such as Web pages, text manuals, colour photos, etc, are usually a mix of black text and colour images. The average ink coverage on paper is only 16 per cent (8 per cent black and 8 per cent colour). However, to print colour (CMYK) you also need to add black ink, therefore 25 per cent black ink is used in every colour printout as well! The weightages actually turn out to be 66 per cent for black (10 per cent coverage) and 33 per cent for colour (6 per cent coverage). Hence the exact calculation is:

Black = 8 per cent + (one-fourth of 8 per cent of colour).

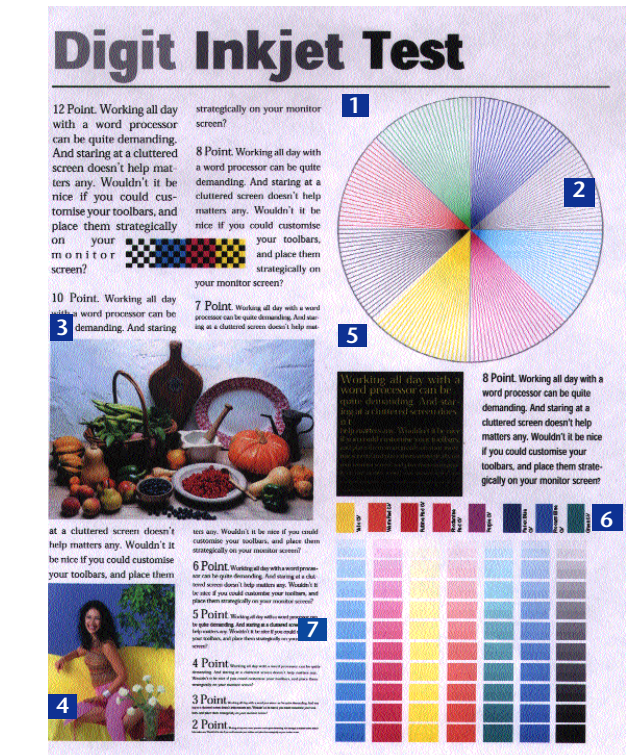
We applied this formula to the results of our cartridge drain test to come up with the cost per page in Rs (factoring in the price per replacement cartridge).

**Warranty and support:** Here we took into account the warranty period for the inkjets, the number of authorised service centres appointed by the company and the number of cities in which authorised service centres are present.

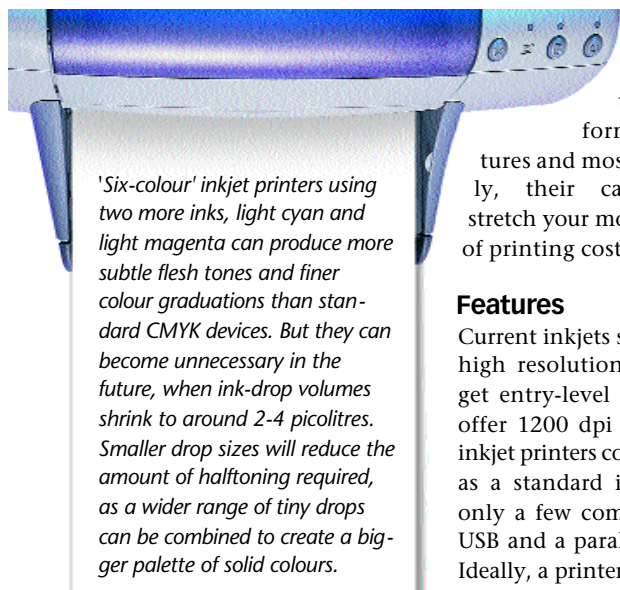
**Value for money:** This is a factor of the performance and features offered by the printer as compared to its price. Therefore, the better the performance and features and the lower the price, the higher will be the value for money of a printer. We computed this value by dividing the sum of an inkjet's scores in performance, features and the total cost of ownership by its price to obtain a value for money index.

Test Analysis

Inkjet printers have shown a marked improvement in not just their core ability to print, but also in delivering the most bang for the buck in terms of running costs and features. Here is how



- 1: **Uniformity of the outline circle:** We checked for misalignments and missing patches.
- 2: **Resolution test:** We examined the printer's ability to reproduce closely packed converging lines.
- 3 and 4: **Quality of photos:** Specific details for each photo was mapped (clarity of the grille pattern, the shine on the fruit and so on).
- 5: **Yellow text on black background:** This area helped us evaluate the printer's ability to print high-contrast text.
- 6: **Number of distinct colour bars:** There are 10 bars in each colour pattern and each bar has two shades. If a printer could print two distinct shades for each bar in every colour pattern, it was awarded a maximum score of 10.
- 7: **Readability of fine text:** This text is in varying point sizes ranging from 6 to 2 points. The printer was awarded one point for each readable line.



*'Six-colour' inkjet printers using two more inks, light cyan and light magenta can produce more subtle flesh tones and finer colour graduations than standard CMYK devices. But they can become unnecessary in the future, when ink-drop volumes shrink to around 2-4 picolitres. Smaller drop sizes will reduce the amount of halftoning required, as a wider range of tiny drops can be combined to create a bigger palette of solid colours.*

each of the printers fared in terms of performance, features and most importantly, their capability to stretch your money in terms of printing costs.

### Features

Current inkjets support fairly high resolutions—you even get entry-level printers that offer 1200 dpi prints. Most inkjet printers come with USB as a standard interface but only a few come with both USB and a parallel interface. Ideally, a printer should have support for both so that people

with older PCs don't have a problem connecting the printer. For a truly cost-effective printer, look for features such as LED indicators, ink level status indicators, and bundled accessories such as a data cable and packs of high-quality photo paper. Features that help you check the level of ink in the cartridges will ensure that you get the most out of your ink cartridges. A visual indicator that the printer is out of ink or paper is a great help if you're working away from your PC after having sent a print command. If your printer doesn't have any visual indicators then there's no way to know what's wrong. Also, the ability to check ink levels via the printer drivers is a great way to monitor and manage the consumption of ink.

Absence of accessories such as a data cable can be quite an irritant as you cannot connect the printer to the PC without one and having to buy a data cable adds to the overall cost of a printer.

Other features that will help you save expenses on consumables are support for dual-sided printing, and the number of options available for changing the print resolution. The latter gives you a greater degree of control as you can then choose to print draft documents at lower resolutions and save on ink.

All printers in the budget category had support for USB and supported at least 600 dpi printing. A notable exception was the Canon S200SP, which offered a maximum resolution of 2880x720 dpi, which compares with the kind of resolutions supported by high-end printers. Canon also claims that a printout taken on Canon Photo Paper will stay resistant to the damaging effects of light for up to 25 years. However, there are no LED indicators on the Canon S200SP.

The Canon BJC-2100SP comes with a rather interesting feature which allows you to also use it as a scanner by simply replacing the ink cartridge with the optional IS-22 scanner cartridge and scan colour images at a decent 360 dpi.

The HP Deskjet 656C and the Olivetti Artjet 12 were the only printers that came with 512 KB of cache. The entire Lexmark series of printers in this category had no cache. Although we did not face any problems printing our test pages on these printers, you might experience a slowdown while printing very large images or heavy documents. The HP Deskjet 656C has LED indicators, which alert you in case of a paper jam or when the printer runs out of paper. This was the only model in the budget category to support dual-sided printing, but there was no support for checking the ink level status via the driver.

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## Jargon Buster

**Dots per inch (dpi):** Image resolution in either the vertical or horizontal axis. On an average, printers have a resolution of 600 dpi vertical and 600 dpi horizontal.

**Duplexing:** A printer's ability to print on both sides of a page in one pass.

**Duty cycle:** The number of pages a printer can produce per month.

**Nozzle (or jet):** Tiny tubes, which allow for a heated ink bubble to travel through as it cools. This is the one vital area of the print head which needs to be cleaned occasionally or replaced.

**Piezo technology:** Epson's proprietary inkjet technology uses a piezo crystal at the back of the ink reservoir. This is rather like a loudspeaker cone—it flexes when an electric current flows through it and in so doing forces a drop of ink out of the nozzle.

**Print alignment:** The proper setting of the ink nozzles and the print head.

**Print head:** An important part of a printer, it contains electrical circuitry and the nozzles to heat and disperse the ink during printing. You should avoid touching or cleaning the print head unless you have a manufacturer-approved solution.

**Printer memory/RAM/input buffer:**

Memory inside your printer that stores data sent from your computer. The more complex your documents, the more printer memory you need. It is also known as the storage memory your printer uses to hold incoming data when it arrives faster than your printer's engine can handle. This results in less waiting time.

**Print speed:** This is measured in pages per minute (ppm) through either of two methods—'rated engine speed' or the number

of pages of text that a printer can produce in one minute using internal fonts, and 'throughput' or how fast raw data is turned into hard copy.

**Resolution:** The image quality is usually measured by the number of dots per inch (dpi) printed. When describing halftone image quality, it may be measured by lines per inch. The more dots or lines per inch, the better the image quality.

**Thermal technology:** Most inkjets use thermal technology, whereby heat is used to fire ink onto the paper. The squirt is initiated by heating the ink to create a bubble until the pressure forces it to burst and hit the paper. The bubble then collapses as the element cools, and the resulting vacuum draws ink from the reservoir to replace the ink that was ejected. This is the method favoured by Canon and Hewlett-Packard.

Lexmark has done a very good job with its drivers. The interface is easy to work with and there are on-screen ink level indicators. All Lexmark printers include a data cable. HP and Olivetti too provide data cables. Canon on the other hand does not provide a data cable with the S200SP and the BJC 2100SP.

In the mid-range category, almost all printers provide a minimum of 1200x1200 dpi printing. All three HP models in this category, the 845C, the 920C and the 948C, offer USB as well as parallel port support and also provide a data cable and come with an impressive 2 MB buffer.

The Canon S300, which had the highest overall score in this category, lets you check ink level status through the driver. It also has built-in indicators for low ink and out-of-paper, but no indicator to alert for a paper jam. It supports dual-sided printing, but only offers a USB interface, which makes it incompatible with older PCs. Also, no data cable is included and it sports only 56 KB of input buffer.

Though the Olivetti Artjet 22 logged the lowest overall score in the mid-range category, it sports some very interesting features. It can be set up horizontally or vertically, which makes it quite versatile if space is an issue. It includes parallel and USB interfaces and supports a paper capacity of 150 sheets, so bulk printing should not be a problem.

Among the high-end printers, the Epson Stylus 880 scored the highest for features. It supports a resolution of 2880x720 and provides both USB and parallel connectivity. It has support for dual-sided printing, shows accurate status of ink tanks through the driver and to top it all, supports iron-on transfers and transparency printing! This model also had LED indicators to alert for paper jams, low ink levels and for when the printer is out of paper. The other entries from Epson in this category (Stylus Photo 810, Stylus 895 and Stylus 1520) also included such LED indicators. All supported USB as well as parallel connectivity, except the Stylus 1520, which offers a parallel and a Mac Serial interface.

While all printers in this category support A4 printing, the Epson Stylus 1520, the HP Deskjet 1125C and the Canon S4500 have support for printing pages in A3 size as well.

The Canon S4500 occupies a lot of desktop space due to its large footprint. It supports a maximum resolution of 1440x720 and comes with 64 KB onboard buffer. It can communicate with the PC through the USB or the parallel interface. There is no data cable provided, nor does it include any printing media. This printer too can be configured as a scanner. All one has to do is replace the ink cartridge with the IS-32 scanner cartridge to scan at 720 dpi.

The Lexmark Z65N too does not fail to impress. It has a mammoth resolution of 4800x1200 dpi and has a huge paper capacity of 250 pages. But the feature that takes the cake is the fact that it comes with integrated network support. Also, paper can be fed into the printer through two separate trays.

## Performance

A printer's performance is judged by the quality of output and the speed at which it is capable of printing. Whether you should consider speed or quality of output when buying a printer will depend on how you plan to use the printer. If you need to print in large volumes, then speed should rate higher in your scheme of things. But if you need prints for presentations, or prints of photographs, then quality of output (along with speed) is critical. In fact, if a printer gives you great quality, then you can consider compromising a little on the speed front.

**Speed:** The speed limitation comes from a variety of factors. The first is what is called the cycle time or the pulse cycle. This is the time taken by the printer head to print one line and then move on to the next. Obviously, a shorter cycle time means higher printing speed. The second factor that affects printing speed is the amount of input buffer available. A large buffer will allow you to print large documents faster, and will result in shorter spool time if the printer is shared over a network.

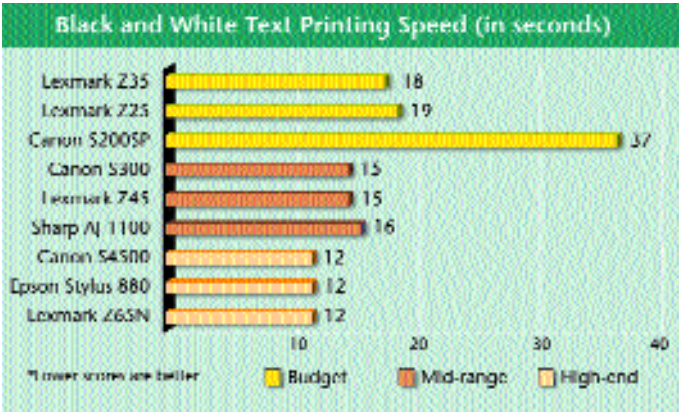
Entry-level printers usually compromise on speed in favour of quality, as a typical budget user wants the perfect balance of quality and speed. Here, a printer that can print a plain black and white sheet under 30 seconds is just about fine. On an average, most printers in the budget range managed to print the black and

white test page in under a minute. But if you want a low-priced printer that can churn out black and white prints on plain paper really fast, then look no further than the Lexmark Z35—it spat out our test page in 18 seconds flat. The Lexmark Z25 was also fast, taking just one extra second to print this document. The Lexmark Z13, on the other hand, took a whopping 102 seconds (1 minute 42 seconds) to print the test page.

In the photo printout test, the Canon BJC-2100SP came out trumps. It finished printing our colour test photo in less than 9 minutes (8 minutes 50 seconds) and took just over a minute (1 minute 5 seconds) to print the greyscale version of the same photo. However, the other Canon entry in the budget segment, the S200SP, was the slowest—it took more than 19 minutes to print the test image! The HP Deskjet 656C was the only printer that could match the pace of the Canon BJC-2100SP in the colour photo test printout; it printed the colour photo in a neat 9 minutes 8 seconds.

Hence, if your print jobs consist of large amounts of text and diagrams in greyscale mode, then the Lexmark Z35 is the best option for you. On the other hand, if you need to print full colour photos as fast as possible, nothing comes close to the Canon BJC-2100SP in this category.

Almost all the printers in the mid-range category could print our test text document in less than 30 seconds. The fastest were the Canon S300 and the Lexmark Z45—both took only 15 seconds. Close on their heels was the Sharp AJ-1100, which took 16 seconds to finish the print. The only sore thumb in this category was the Olivetti Artjet 22, which took a sluggish 1 minute 33 seconds to finish the text print.



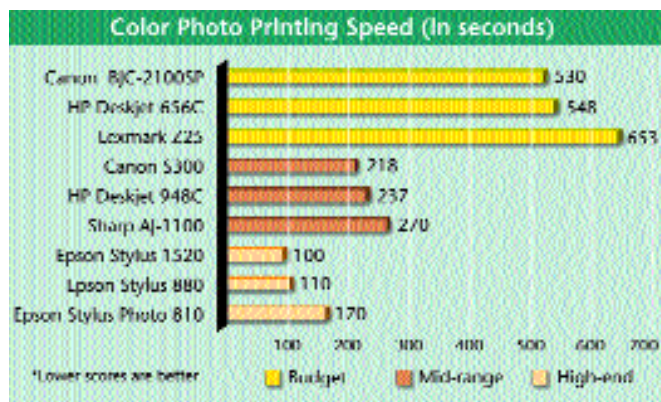
In the colour photo print test, the fastest was once again the Canon S300 (3 minutes 38 seconds). The HP Deskjet 948C came in a close second, taking 3 minutes 57 seconds. In fact, this printer logged pretty decent scores in the speed test for black and white text printing also and if you have a fair quantum of text and colour graphics-based print jobs, then this one gives you adequate speed for both.

The Lexmark Z45 failed to live up to the numbers it posted in the text printout; it took 9 minutes 40 seconds to print the colour photo. A similar trend was observed for the other Lexmark printers too—they are able to print text fairly fast, but are rather sluggish in printing colour. The Lexmark Z45 seems pretty fine-tuned for heavy text and black and white printing and this becomes all the more apparent when you observe the scores for greyscale photo printing (an amazing 48 seconds). The rest languished with scores over a minute for the greyscale test.

Speed is where the high-end printers come into their own because of their advanced print electronics and mechanics. In a

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high-end printer look for a printing speed of under 20 seconds.

Here, the Epson Stylus Photo 810 was the only printer that took over 30 seconds for the black and white text print. The Canon S4500, Epson Stylus 880 and the Lexmark Z65N could print the document in 12 seconds flat—the page was out even before we could get up and take a look at the printer!

The colour document print test was a different story however. The Epson Stylus 1520 came to the fore here, taking 1 minute 40 seconds to print the full colour photo. It was followed closely by the Epson Stylus 880, which took 1 minute 50 seconds. The rest were over a minute slower and nowhere in the reckoning.

The greyscale photo test once again proved what has been observed all along—the Lexmark models rule the roost when it comes to black and white printing. The Lexmark Z65N finished printing the greyscale photo in a mere 29 seconds—the fastest recorded in the entire comparison test.

**Text printing quality:** But speed is not everything. If the output is marred by smears, smudges, misaligned text and jagged edges, then speed cuts no ice. The best printers are those that maintain the right balance of quality and speed and preferably compromise on speed in favour of quality. As a measure of how the scores stack up, 1 out of 5 means that the text is readable but has visible smudges, text is misaligned, or the text isn't crisp enough. A score of 3 out of 5 should be considered normal and neat; printers that score 4 and above should be considered exceptionally good with good black level depth and no jagged edges on the text.

In the budget range of printers, the Canon BJC-2100SP delivered crisp text output and was able to reproduce fonts exactly as they appear on the screen. It scored a neat 3.5. The Canon S200SP came in a close second, scoring 3.4.

The Lexmark series of printers, which logged a consistently fast speed when printing in black and white mode, scored poorly here. The Lexmark Z25 scored only 1.7 and the Z13 scored only 1.4. The Z35, which was also the fastest among the lot, was the only printer from the Lexmark series to score a fairly decent 2.7.

The text quality was markedly better in the mid-range printers. Newcomer Sharp AJ-1100 logged the highest score—it scored a phenomenally high 4.4, the highest in the comparison test. This model was also amongst the fastest in the text speed test, which makes it a great choice for pure text printouts.

The HP Deskjet 920C also did well, scoring a very impressive 4.2—the text was 'jet' black with no smudging, smearing or jaggedness. The Canon S300 too came close with a score of 3.8. If you consider the speed (15 seconds) at which it prints, it

certainly is a force to reckon with.

If you are looking for high speed without sacrificing quality, a high-end printer is what you need. If you are spending so much money then you should not accept anything which scores less than 3.

The HP Deskjet 970CXi and the Epson Stylus Photo 810 were amongst the best here, with a score of 3.8 each. The Canon S4500 has probably the best combination of speed and text quality. It scored a neat 3.5 in text quality and produced consistent quality at an amazing print speed (12 seconds). The only poor performer here was the Epson Stylus 895—the text was heavily jagged and misaligned. We tested this printer repeatedly with two sets of new cartridges, but there was no improvement in the results.

**Photo printing quality:** This one is a torture test. Printing an image at high resolutions or best possible quality puts a printer through tremendous stress. Good overall colour reproduction, contrast, ability to render detail, consistency across the page and most importantly, no smudging—the printer has to do it all. Since a typical photograph has enormous colour variations with no blank spaces, the printer head gets no respite. For instance, when printing text, it would get time off when it encounters spaces between words. Even when printing a block of single colour, it would be less taxing on the printer head. But when it has to jump from colour to colour with no pause in between, the printer gets stressed.

On the whole, the image quality in the budget category was average to above average. The skin colour in the photo was never truly reproduced and was a little faded in all the test prints.

A curious observation: the highest scorer and the lowest scorer were from the same company—the Canon S200SP (a score of 7) and the Canon BJC-2100SP (a score of 4.2), respectively. The photo reproduction in the S200SP was sharp and vivid. There were minimal smudges, the specular effects on the bangle were crystal clear and you could even count the model's teeth! The Canon BJC-2100SP on the other hand showed bands throughout



## Selecting the Right Paper

The paper you use greatly determines the print quality.

Standard quality paper doesn't provide as crisp and bright an image as paper made specially for a particular inkjet printer. The main factors that affect paper quality are:

**Brightness of paper:** This is normally determined by the smoothness of the paper. A coarse sheet of paper will scatter light in different directions, whereas smooth paper will reflect more of the light back in the same direction. This makes the paper appear brighter, which in turn makes images on the paper appear brighter. The finish may be described as high gloss, gloss, soft gloss, or semi-gloss, each reflecting the amount of shine.

**Absorption:** When the printer sprays ink onto the paper, it should stay in a tight, symmetrical dot. If the ink is absorbed too much into the paper, the dot will spread out in an irregular fashion and the result is fuzzy images and text. The coating on photo papers gives the printed photos the look and feel of photographic prints. Because the coating keeps the paper from readily absorbing the ink, some glossy papers dry slowly. However, quick-dry gloss finishes are common today.



## How to Get the Best Quality Printouts

- Use original ink cartridges to prevent clogging, leaks and bleeding.
- Set the printer driver settings correctly.
- The best results will be achieved by matching the printer, printer settings, ink and paper.
- Handle inkjet papers like photographic papers, by the edges to avoid oil deposits and fingerprints.
- Be sure that you are printing on the 'right' side of the paper, that is, the coated side.
- Best image quality (sharpness and colour saturation) is usually obtained at the printer's maximum dpi setting.
- Set your printer for the proper paper type and weight. Fine art papers are heavier than ordinary inkjet or bond papers. If possible, set printer to thicker paper settings, or use the 'envelope' setting.
- Feed heavy/stiff paper one sheet at a time. Placing a sheet of plain copier/bond paper behind a heavy sheet sometimes improves the feed.
- Media settings on your printer determine how much ink will be applied to the paper. Thinly coated glossy films require less ink, while plain paper soaks in more. Coatings are designed to control ink absorption and spread, producing brilliant, sharp images with less ink.
- Allow ink to dry completely to avoid smudging. The time it takes to dry will vary based on the ink and paper quality used as well as the temperature and humidity conditions.

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and because the contrast was poor, the printer was unable to reproduce the depth of field.

The Lexmark series of printers followed close behind the Canon S200SP, with the Z13, Z25 and the Z35 scoring 6.7, 6.8 and 6.8 respectively. Another good performer here was the Olivetti Artjet 12, which scored a healthy 6.6.

The HP Deskjet 656C was quite disappointing—the printout was washed out and there were patches of faded colour.

The printers in the mid-range segment showed much better print quality than the budget printers—all scored over 6 points, except the Sharp AJ-1100, which scored a poor 4.1.

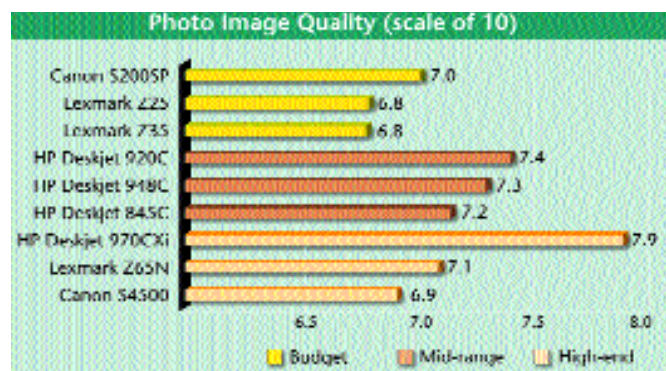
The HP Deskjet 920C scored the highest (7.4). There was no smudging and the detailing was superb. It was one of the few printers that could show the leaves in the background in perfect detail. Skin colour too was close to the original photograph. The HP Deskjet 948C also did well with a score of 7.3—just a shade lower than the 920C.

To complete a hat trick of sorts, the HP Deskjet 845C also logged a score of over 7. The HP Deskjets were truly a class apart when it came to high quality photo printing—at first glance, it gives you the impression that you are looking at the original photograph.

HP logged the highest score among the high-end printers as well. The HP Deskjet 970CXi scored a whopping 7.9—the highest in this test. But most of the high-end printers failed to live up to their expected performance—none other exceeded the highest scores logged by the HP printers in the mid-range segment. The Lexmark Z65N scored a decent 7.1 and the Canon S4500 scored a neat 6.9. Both gave sharp and high quality prints of photos. What they lacked was true-to-life reproduction of colours, especially skin colour.

In the case of the Epson printers, the scores were inconsistent. The colour photo printouts had a lot of smudging and banding despite repeated attempts at cleaning the cartridges and reprinting





with new cartridges. The entire Epson series failed to register a decent score of over 6—the best score logged by an Epson printer was by the Stylus 895, a mediocre 5.2.

**Overall quality (combi document):** The combination document (see Test process) is probably the best way to judge a printer's true quality for ordinary day-to-day printing. It includes text in different point sizes, photos, vector graphics and a varying colour palette across the sheet. The resolution test is probably the most critical component of this test. This was tested through the image of the different coloured converging lines placed within a circle.

In the budget category, both the Canon printers, the S200SP and the BJC-2100SP, were the best when it came to printing vector graphics. They scored a decent 3.1 and 2.7 respectively in the resolution test. In the colour bar test, only the Olivetti Artjet 12 could print seven distinctly visible colour bars. The Canon S200SP could manage only six and the rest were at five or less.

The small photo test was another area where the Olivetti Artjet 12 did well. It printed both the photos with a high level of detail.

Reproducing text on black background was probably the toughest test for these budget printers. There were 13 lines of text on a black patch. The best score here was logged by the Lexmark Z25—it showed 11 distinctly readable lines of text. However, some could manage only three lines and the Canon BJC-2100SP and the Lexmark Z13 could not manage more than four lines. The Olivetti Artjet 12 scored 9, which is pretty average. In fact, the printer did well in all of the combi document tests and is a good choice if you print a lot of Web-based content or print graphics, tables and text.

In the mid-range segment only the HP Deskjet 920C, 948C and the Olivetti Artjet 22 scored over 3 points in the resolution test, with the 920C scoring the maximum at 3.4 points.

In the colour bar test both the Olivetti Artjet 22 and the HP Deskjet 920C scored 7 points each. A printer that can show seven or more distinct colour bars is excellent and if you need printouts with a lot of shades of colour, then these two printers are good choices.

As in the budget segment, the entry from Olivetti performed brilliantly in printing the two small photos. The Artjet 22 scored 3.5 and 4.2 respectively for the two photos. The HP Deskjet 920C also managed a very respectable 3.4 and 3.8, respectively.

In the text readability test, the HP Deskjet 920C edged out the Artjet 22 by a slender margin, scoring 4.3 as against the 4 points scored by the latter. The highest scorer for printing the yellow text on black background was logged by the Sharp AJ-1100—it was able to reproduce 10 of the 13 lines of text. This is quite surprising considering its otherwise dismal performance in the combi document

test—it scored only 2 out of 5 in the resolution test and we could see only five colour bars with distinctly separate shades. It scored below average in both the small photo tests too.

The combi document resolution test again proved to be quite a stumbling block for many of the big boys in the high-end segment. Not many could score over 2 except for the Epson Stylus 895—the circle was perfectly drawn with the lines inside ending exactly where they were supposed to, giving it a very impressive score of 4.3 in the resolution test.

In the small photo test, the HP Deskjet 970CXi showed unmatched quality. The level of detail was astounding and it scored a generous 3.1 and 4.6 for the two photos. The Epson Stylus 895 too did well and scored 3.3 and 4.1 for the two photos.

The HP printers performed well in both the colour bar and yellow text rendering tests. We could make out eight distinct colour bars in both, the 1125C and the 970CXi, with the 970CXi also showing an impressive 10 lines of distinctly readable text.

The HP Deskjet 970CXi and the Epson Stylus 895 were the best printers in the combi document section, scoring consistently well in all the tests.

## Cost of ownership

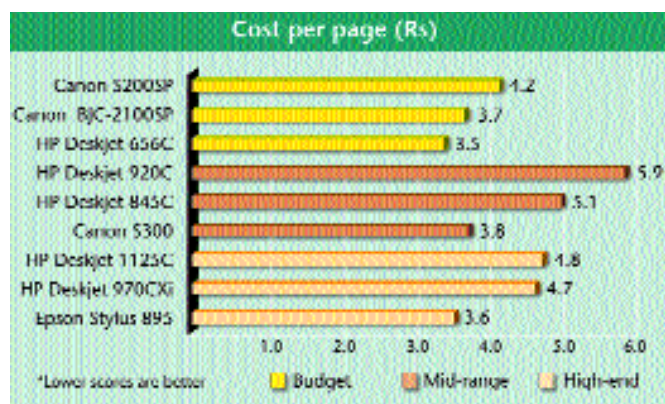
The cost of cartridges coupled with the printing capacity of the cartridges play a very important role in the overall long-term viability of the inkjet you buy. Hence, for the first time ever we included a cartridge drain test. This test is designed to calculate the life of a cartridge and the actual cost-per-page of the printer.

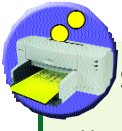
The combined (black and colour) average cost per page for these printers ideally should not exceed Rs 4. To achieve this figure, manufacturers have a tough job at hand—they need to keep the cartridge prices low and at the same time increase the number of pages you can print per cartridge.

As far as budget printers go, Canon's strategy is to keep cartridge costs at a bare minimum, but it does so by compromising on page counts. So even though the Canon S200SP can print only 99 black pages and 153 colour pages, the cost of replacing the cartridge is as low as Rs 395 for black and Rs 695 for colour. The cost per page for this printer turns out to be a decent Rs 4.2.

The Canon BJC-2100SP, on the other hand, scores a trifle better. It prints only 79 black pages and 146 colour pages, but the cartridge cost is an amazingly low Rs 345 for black and Rs 395 for colour. This brings down the cost per page to a neat Rs 3.73.

HP's strategy is to ensure that the cartridge is voluminous and can print higher page counts. The HP Deskjet 656C prints a whopping 346 pages in black and 378 (the highest recorded in the test) for colour. The cost of the cartridges is Rs 1,150 for the





## Saving Money on Printing

- Use draft print mode if the printout is not meant as the final copy.
- Use a smaller font if the printout is meant only for checks.
- Leave the printer on because each time it is switched on or off, the printer purges ink to clean the print head.
- Opt for a printer that has individual ink tanks. That would save you the cost of having to replace an entire ink cartridge just because one or two colours have run out.
- Reduce paper consumption through duplex printing, which involves printing on both sides of the paper. However, this feature is not available in all printers. Some printers have printer drivers that can print multiple pages on a sheet. Multi-up printing is an excellent way to save paper as it reduces paper and ink use, speeds up the printing process and causes less wear and tear on printers.
- You can also use software such as FinePrint 2000 to print two, four, or even eight pages on a single piece of paper. It will also allow you to print on both sides of the paper even if your printer does not support dual-sided printing. A trial version of the software is available for download at [www.fineprint.com](http://www.fineprint.com).

black cartridge and Rs 1,390 for colour, so the cost per page works out to Rs 3.45.

On the other hand, we have the inexpensive Lexmark Z13, with a price tag of just Rs 2,990, but which serves up an exorbitant cost per page of Rs 8.80. Add up the price of its black cartridge and colour cartridge (a total of Rs 2,400) and you might as well buy a new printer. But nothing can beat the Olivetti Artjet 12 for its sky high cost per page. It runs up to Rs 11.50 per page and this is primarily because its cartridges cost an astronomical Rs 2,236 (black) and Rs 2,412 (colour). If you add up these prices, it amounts to buying another Artjet 12!

The cost per page is higher for mid-range printers because their cartridges cost more. The worst of the lot was the Lexmark Z45. The cartridge cost is really high (Rs 1,695 for black and Rs 1,995 for colour) and the printing volumes for black and colour are quite low. As a result, the Lexmark has a per page printing cost of Rs 12. The Olivetti isn't too far behind either, with a cost per page of Rs 11.30.

The HP trio—the 845C, 920C and the 948C—achieved a cost per page of around Rs 5.50. The cartridge cost of all HP printers doesn't exceed Rs 1,700 for the colour and Rs 1,400 for black cartridge. Couple this with the high page counts per cartridge and you have the right balance.

The best of the lot here though was the Canon S300. It printed 119 black pages and 153 colour pages. Factor in the low priced cartridges (Rs 395 for black and Rs 695 for colour) and you get an amazing low cost of Rs 3.78 per page.

Epson's strategy in the high-end bracket is probably the perfect strategy to adopt. It has kept cartridge costs at just around Rs 1,000 with relatively decent page counts. Take for example the Epson Stylus 895, which printed 257 black and 183 colour pages. Its cartridge costs a really low Rs 820 for colour and Rs 790 for black. This translates to a low cost per page of Rs 3.60.

But the champion here is without doubt the HP Deskjet 970CXi. It prints a voluminous 455 pages for the black cartridge and its cartridges are priced fairly reasonably at Rs 1,670 for colour and Rs 1,350 for black. It achieves a very economical Rs 4.70 per page.

The Canon S4500 too can print large volumes (228 pages for

# 1/2 page V. AD



black and 305 for colour), but its black and colour cartridges cost around Rs 2,000, which push its cost per page to Rs 8.20.

### Warranty and support

Printers suffer a lot of wear and tear due to heat build up as they are thermal devices, and there is constant friction within all the moving parts. It is not uncommon to face frequent paper jams, ink leaks and misalignment after about a year of regular use. Hence, a printer should be at least under a repair warranty for more than two years, ideally for three years.

Not one manufacturer provided such a warranty. Providing a large service network and support across cities helps to a certain extent but lack of a repair warranty extended beyond a year is hard to justify.

HP has the largest service network in this country—it claims to have over 230 service centres across 79 Indian cities. It provides a carry-in warranty on its printers and the best thing is that a printer will be replaced or repaired within 48 hours. With such a wide network you generally wouldn't face a problem getting your printer to a service centre.

### What it all leads to...

After putting the printers through the battery of tests for performance, features and economy, the following are the ones that emerged victorious:

**Budget printers:** This category is where most home users will make their purchases from. A budget printer does not necessarily mean low performance. As a matter of fact, the **Lexmark Z25** gives the mid-range printers a run for their

money and is our Best Performance winner. This printer is a powerhouse when it comes to text printing speed but it compromises on quality a fair bit. However, it does pretty well in the colour photo quality test. The Lexmark Z35 too is a good printer and it was beaten by a hair's breadth here. The Lexmark Z25 should top your list if you want the best colour photo quality combined with blazing text printing speeds.

The **Lexmark Z13** wins our Best Value Award. This printer costs just Rs 2,990 and offers acceptable print quality. Though the cost per page is Rs 8.80, if you are in the market for a printer that has a low initial cost, and you need only occasional printouts, then the Lexmark Z13 should be your choice.

**Mid-range printers:** It would be difficult for most printers to match the print quality of the **HP Deskjet 920C**. It can print amazing photo prints and it wins our Best Performance Award hands down. All through the test this printer kept plugging away at the scores: it came in second in the text printing quality test and in the combi document test. But what clinches the deal is the fact that it is the best printer in its category as far as photo printing goes.

The Best Value Award in this segment goes indisputably to the **HP Deskjet 845C**. It offers high quality printing at a decent price—it costs just Rs 6,499! Couple this with a relatively low cost per page of Rs 5.10 and you have a winner on your hands.

**High-end printers:** Compare a photo printout of the **HP Deskjet 970CXi** to a real photograph and you'll probably end up searching for flaws in the photograph itself. Vibrant rendering of colours and unmatched quality of text printout makes this the champion in the high-end arena. It bagged the Best



## Caring for Your Printer

- Align the ink cartridge after you've installed it. Use the software bundled with the printer for doing this.
- Always store cartridges in their factory-supplied containers or in a small, zip-lock bag in a cool and dry place.
- To avoid paper jams, clean the inside rollers with alcohol. Set your paper guides carefully when placing paper in the in-tray. Never mix paper types in the same tray. Fan through the sheets to separate them before loading the paper tray.
- Use the paper recommended by your printer manufacturer. Use good quality

paper even for printing drafts as it prevents paper dust from clogging the printer.

- Always use your printer's power switch rather than the switch on a surge protector to switch off your printer.
- Over a period of time, the prints you get will become faint and there will be lines running across the page. To restore the original print quality, many inkjets come with a nozzle clearing function that blows ink through the nozzles to unclog them. Use this feature regularly, especially if the printer has been unused for weeks.

- If you find a leak, don't try to fix it yourself. Call the authorised service centre.
- For optimum and trouble-free performance, always use the original ink cartridges and do not get them refilled.
- Air bubbles in the cartridge can cause your printer to shut down. Never shake your ink cartridge as that creates bubbles.
- If you remove a part of your ink system such as the print head or ink reservoir, remember to replace it. Opening the system for even a few hours allows the ink to dry out and clog the print head.

# Strip AD



## Ink is Where the Money is

### 1. Do refilled cartridges save money?

Printers are designed for a specific type of ink. Ink cartridges are the cash cow for manufacturers who sell printers at discounted prices. You could circumvent this cartridge cost by refilling a cartridge rather than buying a new one, but you should be aware of the risks. Using non-recommended or spurious ink can affect the printer's performance. It could even damage the printer and void the warranty. A more viable option is to purchase compatible cartridges from third-party manufacturers that are specifically made for your printer.

### 2. What is the difference between a replacement cartridge and remanufactured cartridge?

Replacement cartridges are manufactured by a third party but are compatible with the printer. Usually there is no difference in quality. A remanufactured cartridge is a used one that is professionally cleaned, refilled and tested.

### 3. What is a 'universal' refill kit?

Some companies sell kits meant for refilling any cartridge. Technically, each cartridge requires ink of a special chemical formulation for it to function correctly. For

the most part, inks are not interchangeable between cartridges.

### 4. Will using compatible cartridges or refilling my cartridge void the warranty?

If a printer is damaged because of a modified or refilled cartridge, the cost of repairs will not be covered under the warranty.

### 5. How often should I replace my cartridge?

Replace it as soon as it dries up. If you keep a dried up cartridge plugged in for a long period of time (more than two weeks) then the print head can get clogged, causing poor quality prints and inefficient use of ink.

Performance Award with ease. Print quality was where it really shone and it won the text printing round hands down along with the photo quality round.

The Best Value Award in this segment goes to the **Epson Stylus Photo 810**. A high-end printer filled with features for as low as Rs 14,000 is hard to beat. It displayed a perfect balance between printing speed and quality and came in close behind the winners in most of the tests. For a high-end printer, it achieves a wonderfully low cost per page of Rs 4.90. This printer will print pages by the reams at high speed without burning a hole in your pocket.

## The Winners!

**Lexmark Z25:** The Lexmark Z25 weighs just 2.2 kg and sports good solid looks. It features a retractable paper tray, which could save some desktop space when the device is not in use. This printer features a maximum resolution of 1200x1200, which is good enough for photo quality printouts too. It has a USB interface and getting the device up and running is no problem at all—all you have to do is connect the device and load its drivers. However, the absence of a parallel port means that you cannot connect it to older PCs. This printer sports some fun features too, such as the ability to print on iron-on transfers that let you print and transfer an image to your T-shirt.

The software included

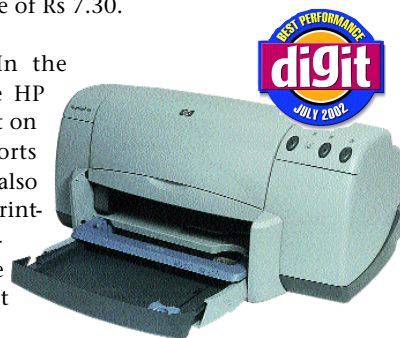


*Fast print speeds and very decent print quality makes the Lexmark Z25 a hot choice in the budget segment*

in the package features a user-friendly interface and monitors the ink levels quite accurately. The package includes a manual and a data cable and though there is no printing media included, it is attractively priced at Rs 4,500. However, it has a relatively high cost per page of Rs 7.30.

### HP DeskJet 920C:

In the mid-range section, the HP Deskjet 920C comes out on top. This printer supports dual-sided printing and also features photo quality printing and iron-on transfers. There are three LEDs on the device that alert you in case of paper jam, low ink or if there's no paper in the input tray. The package includes a data cable, manual and driver CD. The HP Deskjet 920C features a maximum resolution of 2400x1200 dpi and sports both the USB and parallel ports. It has 2 MB of onboard buffer and a paper capacity of 100 pages. This printer costs approximately Rs 8,000 and has a cost per page of Rs 5.90.

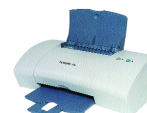


*The HP Deskjet 920c is a great choice for those who demand good image quality and don't mind a slightly slower printing speed*

**HP DeskJet 970CXi:** When it comes to near perfect image quality and good printing speed, this printer delivers. The printer features a 4 MB buffer and provides a USB as well as a parallel interface. It supports a paper capacity of a hefty 150 sheets—an advantage for those who print in large quantities. It also supports

## Strip AD





CATEGORY		BUDGET (UP TO RS 6,000)				
Model	Canon BJC-2100SP	Canon S200SP	HP Deskjet 656C	Lexmark Z13	Lexmark Z25	Lexmark Z35
<b>Features</b>						
Weight (kg)	2.4	2.4	4.5	1.9	2.2	2.3
Dimensions (h x w x d) mm	164 x 370 x 191	162 x 390 x 189	473 x 220 x 253	306 x 386 x 425	444 x 457 x 311	311 x 447 x 457
Printing technology	Bubble Jet	Bubble Jet	Thermal	Thermal	Thermal	Thermal
Resolution (dpi x dpi)	720 x 360	2880 x 720	1200 x 600	1200 x 1200	1200 x 1200	2400 x 1200
Printed speeds for B&W, Colour (PPM)	5, 2	5, 3	6, 3	7, 4	9, 6	11, 6
Max paper width	A4	A4	A4	A4	A4	A4
Paper capacity	50	50	100	100	100	100
Interface (USB / Parallel)	USB, Parallel	USB	USB	USB	USB	USB
Indicators (Paper Jam, Out of Paper, Out of Ink)	✗ ✗ ✗	✗ ✗ ✗	✓ ✓ ✗	✓ ✓ ✗	✓ ✓ ✗	✓ ✓ ✗
On-built RAM, Input buffer (KB)	NA, 54	NA, 64	512, 32	NA, NA	NA, NA	NA, NA
Accessories (Y/N)						
Data cable	✗	✗	✓	✓	✓	✓
Bundled printing media	None	None	None	None	None	None
Software provided	Adobe Acrobat Reader	Adobe Acrobat Reader	Franklins Instant Greetings, HP Photo Printing, HP Photo Web Sharing, HP Internet Connection Center	User's Manual on CD and Adobe Acrobat Reader	User's Manual on CD and Adobe Acrobat Reader	User's Manual on CD and Adobe Acrobat Reader
<b>Manuals and documentation (Y/N)</b>						
Listing of specifications	✓	✓	✗	✗	✗	✗
Troubleshooting	✓	✓	✓	✓	✓	✓
Quick setup guide	✓	✓	✗	✓	✓	✓
After sales contact info	✓	✓	✓	✗	✗	✗
<b>Misc features (Y/N)</b>						
Dual-side printing support	✗	✗	✓	✗	✗	✗
Status of ink levels (via driver)	✓	✓	✗	✓	✓	✓
Photo printing	✓	✓	✓	✗	✓	✓
Iron-on transfers	✓	✓	✓	✗	✓	✓
Transparency printing	✓	✓	✓	✓	✓	✓
<b>Performance</b>						
Speed test (in seconds)						
B&W text printout	38	37	37	102	19	18
Colour photo printout	530	1161	548	868	653	680
Greyscale photo printout	65	215	190	426	79	225
Text printing quality (scale of 5)	3.5	3.4	2.4	1.4	1.7	2.7
Image quality - photo (scale of 10)	4.2	7.0	4.7	6.7	6.8	6.8
Image quality - combi document						
Resolution test (scale of 5)	2.7	3.1	0.7	1.5	1.5	1.5
Uniformity of bounding circle (scale of 5)	1.0	1.5	2.4	0.8	1.0	1.5
No. of distinct colour bars (10 bars)	5	6	4	4	4	5
Yellow text on black background (13 lines of text)	3	9	10	3	11	10
Quality of small photo #1 (scale of 5)	1.8	2.6	1.5	2.4	2.8	2.1
Quality of small photo #2 (scale of 5)	2.6	2.7	2.8	3.6	4.0	4.1
Readability of fine text (scale of 5)	4.0	4.0	4.0	4.0	4.0	4.0
<b>Cost of ownership *</b>						
Tested black cartridge life (pages)	79	99	347	178	158	238
Tested color cartridge life (pages)	147	153	379	98	171	122
Cost per page (Rs)	3.7	4.2	3.5	8.8	7.3	6.9
<b>Warranty &amp; support</b>						
Number of authorised service centres	40	40	230	37	37	37
Number of cities where service centres are present	24	24	79	35	35	35
Period of warranty (Years)	1	1	1	1	1	1
<b>Overall score</b>						
Features (25%)	13.00	17.05	15.71	12.71	15.71	15.71
Cost of ownership (20%)	14.73	13.09	15.93	6.22	7.55	8.01
Performance (25%)	13.61	13.69	12.96	8.96	14.86	14.76
Warranty & Support (10%)	4.00	4.00	6.00	5.00	5.00	5.00
Value for Money (20%)	18.39	14.62	16.22	18.65	16.94	13.74
Overall	63.73	62.45	66.82	51.54	60.06	57.22
Overall Product Rating						
Vendor name	Canon India Pvt Ltd	Canon India Pvt Ltd	HP India Ltd.	Lexmark Intl (India) P Ltd.	Lexmark Intl (India) P Ltd.	Lexmark Intl (India) P Ltd.
Phone	011-6147187	011-6147187	011-6196144	044-8242090	044-8242090	044-8242090
Price (In Rs)	4,495	5,995	5,499	2,990	4,500	5,600
Black / Colour Cartridge Price (Rs)	345 / 395	395 / 695	1,150 / 1,390	1,150 / 1,250	1,150 / 1,250	1,150 / 1,250
E-mail	brijesh@canon.co.in	brijesh@canon.co.in	princy_bhatnagar@hp.com	frandugg@lexmark.com	frandugg@lexmark.com	frandugg@lexmark.com



We ran a series of cartridge drain tests to calculate the effective cost per page and cartridge life (refer to test process)



	MID-RANGE (RS 6,000 TO RS 12,000)						
Olivetti Artjet 12	Canon S300	HP Deskjet 845C	HP Deskjet 920C	HP Deskjet 948C	Lexmark Z45	Olivetti ArtJet 22	Sharp AJ-1100
2.5	3.4	5.2	5.7	5.6	2.6	5.4	3.3
350 x 165 x 210	185 x 390 x 248	185 x 446 x 355	250 x 440 x 196	196 x 440 x 400	186 x 445 x 245.5	210 x 436 x 170	250.5 x 440 x 132
Thermal	Bubble Jet	Thermal	Thermal	Thermal	Thermal	Thermal	Thermal
1200 x 1200	2400 x 1200	1200 x 600	2400 x 1200	2400 x 1200	2400 x 1200	1200 x 1200	2400 x 1200
7, 4	11, 7.5	8, 5	9, 7.5	6.8, 3.1	15, 9	13, 9	12, 8
A4	A4	A4	A4	A4	A4	A4	A4
50	100	100	100	100	100	150	100
USB, Parallel	USB	USB, Parallel	USB, Parallel	USB, Parallel	USB	USB, Parallel	USB, Parallel
✓ ✓ ✗	✗ ✓ ✗	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✗	✗ ✓ ✗	✗ ✓ ✓
NA, 512	NA, 56	2048, 48	2048, NA	2048, NA	2048, NA	NA, 512	NA, NA
✓	✗	✓	✓	✓	✓	✓	✗
None	None	None	Sample pack of 5 sheets of HP Premium Photo paper	Sample pack of 5 sheets of HP Premium Photo paper	None	None	None
Picture Publisher and Micrografx Draw	Adobe Acrobat Reader	HP PhotoPrinting Software	HP PhotoPrinting Software	HP PhotoPrinting Software	User's Manual on CD and Adobe Acrobat Reader	Picture Publisher and Micrografx Draw	MGI PhotoSuite III
✓	✓	✗	✓	✓	✗	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✗	✓	✓
✗	✓	✓	✓	✓	✓	✗	✗
✓	✓	✗	✗	✗	✓	✓	✓
✗	✓	✓	✓	✓	✓	✗	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✗	✓	✓
93	15	22	23	17	15	93	16
1100	218	384	313	237	580	1100	270
142	168	122	93	70	48	142	118
2.3	3.8	2.3	4.2	2.6	2.9	3.1	4.4
6.6	6.9	7.2	7.4	7.3	6.7	6.6	4.1
2.1	2.2	2.4	3.4	3.1	1.5	3.2	2.0
3.5	1.9	2.0	3.8	3.3	1.5	3.7	2.1
7	4	5	7	6	5	7	5
9	10	9	5	5	9	9	10
3.4	2.3	1.6	3.4	3.0	2.6	3.5	2.5
4.2	2.5	4.5	3.8	3.8	4.3	4.2	2.5
4.0	3.0	3.6	4.3	4.0	4.0	4.0	3.3
198	119	347	248	277	149	248	198
214	153	201	208	183	153	171	214
11.5	3.8	5.1	5.9	6.0	12.0	11.3	6.9
137	40	230	230	230	37	137	17
80	24	79	79	79	35	80	17
1	1	1	1	1	1	1	1
14.83	17.13	16.49	16.74	16.74	16.71	14.33	15.41
4.76	14.52	10.88	9.28	9.14	4.56	4.86	7.91
11.74	16.76	15.66	17.73	16.71	16.15	12.36	16.30
6.00	4.00	6.00	6.00	6.00	5.00	6.00	3.00
12.28	12.11	13.24	10.94	8.52	9.98	7.00	11.66
49.61	64.52	62.27	60.69	57.11	52.40	44.54	54.28
B-	B-	B+	B+	B	B-	C+	B
Spice net	Canon India Pvt Ltd	HP India Ltd.	HP India Ltd.	HP India Ltd.	Lexmark Intl (India) P Ltd.	Spice net	Sharp Business Systems India Ltd
022-6122419	011-6147187	011-6196144	011-6196144	011-6196144	044-8242090	022-6122419	022-8581539
5,100	7,995	6,499	7,999	9,999	7,500	9,020	6,500
2,236 / 2,412	395 / 695	1,150 / 1,600	1,150 / 1,670	1,150 / 1,670	1,695 / 1,995	2,236 / 2,579	1,200 / 1,200
ro_mum@spicenetindia.com	brijesh@canon.co.in	princy_bhatnagar@hp.com	princy_bhatnagar@hp.com	princy_bhatnagar@hp.com	frandugg@lexmark.com	ro_mum@spicenetindia.com	channel-sharp@Int.ebg.com





Model	Canon S4500	Epson Stylus Photo 810	Epson Stylus 880	Epson Stylus 895	Epson Stylus 1520	HP Deskjet 970CXi	HP Deskjet 1125C	Lexmark Z65
Weight (kg)	7.1	3.5	6.0	5.3	11.5	5.8	9.4	4.9
Dimensions (h x w x d) mm	205 x 574 x 328	175 x 471 x 290	338 x 175 x 449	212 x 467 x 256	203 x 660 x 508	279 x 432 x 203	224 x 579 x 380	216 x 445 x 300
Printing technology	Bubble Jet	Piezo	Piezo	Piezo	Piezo	Thermal	Thermal	Thermal
Resolution (dpi x dpi)	1440 x 720	2880 x 720	2880 x 720	2880 x 720	1440 x 720	2400 x 1200	1200 x 600	4800 x 1200
Claimed speeds for B&W, Colour (PPM)	9, 6	12, 11.7	12, 9	7.8, 7.6	6, 5	6.5, 5	6.5, 2.5	21, 15
Max paper width	A3	A4	A4	A4	A3	A4	A3	A4
Paper capacity	100	100	100	100	100	150	150	250
Interface (USB / Parallel)	USB, Parallel	USB, Parallel	USB, Parallel	USB, Parallel	Parallel, Mac Serial/Type B	USB, Parallel	USB, Parallel	USB
Indicators (Paper Jam, Out of Paper, Out of Ink)	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
On-board RAM, Input buffer (KB)	NA, 64	NA, 32	NA, 256	NA, 32	NA, 64	4096, 4	2048, 2048	NA, 256
Accessories (Y/N)								
Data cable	✗	✗	✗	✗	✗	✓	✓	✓
Bundled printing media	None	None	None	None	None	Sample pack of 5 sheets of HP Premium Photo paper	None	None
Software provided	Adobe Acrobat Reader	Epson Status Monitor 3, Epson Photo-Quicker, Epson PhotoStarter, Online Guide, Problem Solver	Epson Status Monitor 3, Epson PhotoQuicker, Epson Photo-Starter, Online Guide, Problem Solver	Epson Status Monitor 3, Epson PhotoQuicker, Epson Photo-Starter, Online Guide, Problem Solver	Epson Status Monitor 3, Epson PhotoQuicker, Epson Photo-Starter, Online Guide, Problem Solver	Software	Software	User's Manual (CD and Adobe Acrobat Reader)
Manuals and documentation (Y/N)								
Listing of specifications	✓	✓	✓	✓	✓	✓	✓	✓
Troubleshooting	✓	✓	✓	✓	✓	✓	✓	✓
Quick setup guide	✓	✓	✓	✓	✓	✓	✓	✓
After sales contact info	✓	✓	✓	✓	✓	✓	✓	✓
Misc features (Y/N)								
Dual-side printing support	✗	✗	✓	✗	✗	✓	✓	✗
Status of ink levels (via driver)	✓	✓	✓	✓	✓	✗	✗	✗
Photo printing	✓	✓	✓	✓	✓	✓	✓	✓
Iron-on transfers	✓	✓	✓	✓	✓	✓	✓	✓
Transparency printing	✓	✓	✓	✓	✓	✓	✓	✓
Performance								
Speed test (in seconds)								
B&W text printout	12	31	12	14	21	20	20	12
Colour photo printout	444	170	110	198	100	260	470	575
Greyscale photo printout	101	96	184	79	84	90	56	29
Text printing quality (scale of 5)	3.5	3.8	3.6	0.7	2.8	3.8	3.3	3.3
Image quality - photo (scale of 10)	6.9	3.8	4.7	5.2	3.3	7.9	5.6	7.1
Image quality - combi document								
Resolution test (scale of 5)	3.2	2.6	3.1	4.3	0.3	2.4	2.7	1.8
Uniformity of bounding circle (scale of 5)	2.0	3.3	3.0	3.0	0.6	2.3	2.4	1.8
No. of distinct colour bars (10 bars)	7	5	5	6	4	8	8	5
Yellow text on black background (13 lines of text)	10	10	9	9	10	10	8	10
Quality of small photo #1 (scale of 5)	1.6	2.8	2.8	3.4	1.2	3.1	2.1	3.2
Quality of small photo #2 (scale of 5)	4.0	4.5	4.3	4.2	3.2	4.6	4.1	4.1
Readability of fine text (scale of 5)	4.0	4.0	4.0	4.0	4.3	4.3	4.3	3.7
Cost of ownership *								
Estimated black cartridge life (pages)	228	238	257	257	198	455	396	416
Estimated color cartridge life (pages)	305	159	183	183	110	220	214	183
Cost per page (Rs)	8.2	4.9	6.5	3.6	6.1	4.7	4.8	5.8
Warranty & support								
Number of authorised service centres	40	117	117	117	117	230	230	37
Number of cities where service centres are present	24	40	40	40	40	79	79	35
Period of warranty (Years)	1	1	1	1	1	1	1	1
Overall score								
Features (25%)	15.91	18.00	20.24	18.00	16.24	18.00	17.00	18.63
Cost of ownership (20%)	6.72	11.13	8.61	15.28	9.07	11.69	11.44	9.63
Performance (25%)	16.98	15.78	16.41	14.96	14.50	18.45	16.19	17.01
Warranty & Support (10%)	4.00	6.00	6.00	6.00	6.00	6.00	6.00	5.00
Value for Money (20%)	3.11	6.41	4.53	4.59	1.94	5.35	4.51	4.16
Overall	46.72	57.32	55.79	58.83	47.75	59.48	55.15	54.43
Overall Product Rating	C+	B	B	B	C+	B	B	B
Vendor name	Canon India Pvt Ltd	Epson India Pvt Ltd	Epson India Pvt Ltd	Epson India Pvt Ltd	Epson India Pvt Ltd	HP India Ltd.	HP India Ltd.	Lexmark Intl (India) P Ltd.
Phone	011-6147187	080-5321266	080-5321266	080-5321266	080-5321266	011-6196144	011-6196144	044-8242090
Price (Rs)	24,995	14,000	20,000	21,000	41,000	17,999	17,999	18,900
Black / Colour Cartridge Price (Rs)	1,995 / 2,195	980 / 1,000	1,260 / 1,300	790 / 820	1,055 / 800	1,350 / 1,670	1,350 / 1,525	1,550 / 1,650
E-mail	brijesh@canon.co.in	azra@eid.epson.co.in	azra@eid.epson.co.in	azra@eid.epson.co.in	azra@eid.epson.co.in	princy_bhatnagar@hp.com	princy_bhatnagar@hp.com	frandugg@lexmark.com

We ran a series of cartridge drain tests to calculate the effective cost per page and cartridge life (refer to test process)

dual-sided and transparency printing.

The package includes the driver CD, manuals and a data cable. LED indicators on the front panel alert you in case of a paper jam or when the ink is dangerously low or when the printer is out of paper. The paper tray in this model is not retractable and as a result this printer takes up more desktop space. This printer costs Rs 17,999 and the cost per page is Rs 4.70.



*If you are looking for supreme image quality at a respectable output speed, then the HP Deskjet 970CXi should be right up your alley*

**Lexmark Z13:** This printer features a maximum resolution of 1200x1200. It communicates with the PC using the USB interface. Though there is no onboard buffer, this did not impact its printing speed. This printer is quite small and the retractable paper tray further reduces the amount of desktop space it would require. The Lexmark Z13 does not

*The Lexmark Z13 is a good bargain for those who require a printer for ordinary text print jobs*



## Think Before you Buy

- Choose a printer according to the kind of output you plan to print. In general, laser printers offer the best-quality text, and inkjet printers offer the best-quality photos and graphics.
- Make sure to judge a printer by the print speed necessary for the quality level you want to use. The rated speeds for inkjets usually refer to the printer's fastest mode rather than the higher-quality modes you're more likely to use.
- Check the amount of buffer memory on the printer. The more the better.
- Always take a test print of the colour image to see the quality of colour reproduction.
- Check the connections. If your PC doesn't support USB, make sure the printer has a parallel port.
- Consider the total cost of ownership, not just the purchase price. Depending on how many pages you print, a difference of even a rupee per page can save you hundreds of rupees over the lifetime of the printer.
- Check whether the ink levels can be determined through software so that you can tell when to replace the cartridge.
- Check the manufacturer's Web site to make sure the site provides driver updates and tech support information.
- Check the space required for the printer—it should fit into the cabinet or on your desk.

## Decision Maker

	Entry-level printer	Good balance of speed and performance	Super fast speeds with no compromise on quality
<b>You need</b>	A colour printer for occasional printing of Web pages, letters and mostly text documents; very low purchase price. You are okay with slow printing speeds	A printer that allows you to print photographs at high speed, and take prints of large documents. Speed and quality both matter to you	Photo realistic printout with crisp vibrant colours, superior quality for graphics and photos
<b>Look for</b>	An A4 printer with the ability to print colour at a cost per page of less than Rs 5	Speeds of under 30 seconds for text printing and about 5 minutes for a full-colour photo quality printout	Printers with a resolution of 2400x2400, along with additional features to enhance photo printing
<b>Our pick</b>	Cannon S200SP, HP Deskjet 656C and Canon BJC-2100SP	HP Deskjet 845C, Canon S300 and HP Deskjet 920C	HP Deskjet 970CXi, Epson Stylus Photo 810 and Epson Stylus 895
<b>Price range</b>	Rs 4,500 to Rs 6,000	Rs 6,500 to Rs 8,500	Rs 14,000 to Rs 21,000

offer support for dual-sided printing or photo printing, but it does support transparency printing. The driver helps monitor ink levels in the cartridge. Though the image quality of the printer is nothing to write home about, its unbeatable price of Rs 2,990 makes it a good buy. However, you must take into account its per printout cost, which is on the higher side at Rs 8.80.

**HP Deskjet 845C:** The HP Deskjet 845C is the best value option in the mid-range segment due to its attractive pricing and features. The overall image quality is good and the package includes the driver CD and a data cable. The printer supports photo printing, iron-on transfers and transparency printing. The Deskjet 845C sports good looks but occupies quite some space on the desktop, as the paper tray is not fully retractable.



*Give the Deskjet 845C a thumbs up if you are looking for good speed and image quality*

**Epson Stylus Photo 810:** This printer supports both USB and parallel interfaces. An impressive feature is that it supports Print Image Matching technology which creates a direct link with your digital camera, perfectly calibrating a range of settings to create the highest quality images possible. It has support for a resolution of 2880x720 dpi and in case of a paper jam or an out of ink/paper error, the LEDs on the front of the device light up. It supports photo printing, transparency printing and iron-on transfers, but not dual-sided printing. The package includes just the driver CD; there was no data cable or bundled printing media.



*Superfast printouts, an impressive array of features and a low cost per page make the Stylus Photo 810 an ideal choice*

DIGIT TEST CENTRE









# Say Cheese!

Whether you're a shutterbug who wants a digital camera to share photos online or you're seriously interested in digital photography, this test will help you make the right choice

We see it all around us—budget home theatre systems, fast computers on easy instalments and dirt cheap cell phones that are now being used by even your local *paanwala*! Riding on this wave of widespread acceptance of technology products by the masses is another category—digital cameras.

Not too long ago, digital cameras were outrageously expensive and out of reach for the average shutterbug. Even with its long-term benefits and convenience, the price proved to be a big stumbling block. With the advancement of technology, prices have fallen, bringing a wide range of digital cameras that suit everyone—from the most basic digital cameras that allow you to video-conference, to those that strike a good balance between imaging capabilities and features, all the way to the big guys that offer brilliant optics and professional level imaging performance.

Digital cameras are fast catching up with their conventional counterparts in terms of

imaging capability and there will be a time in the not-too-distant future when photography will completely transit into the digital realm. While these high-performance cameras are still beyond the reach of most of us, they are certainly more affordable than they were, say, about a year ago. Most basic level digital cameras then sported specifications like 1-megapixel CCDs; today, you can easily find 2-megapixel cameras for the same price. With the proliferation of broadband Internet access, digital cameras are the coolest devices to effortlessly capture and transmit those memorable moments. Imagine taking a photo of your little baby when it takes its first stumbling steps and e-mailing it to your relatives halfway around the world or posting it on your Web site, all within the matter of a few minutes!

All these factors, coupled with some truly cool features such as the capability to record movie clips, apply special effects to images from the camera itself, and their immense user-friendliness and pocket-sized form factors have made these devices great fun to use, at the same time giving you superb quality photographs.

## Digit Test Process

### Qualification criteria

We reviewed cameras in two categories: those with a CCD rating of under 2 megapixels and those between 2 to 3.5 megapixels. However, in the 2+ megapixel category, most of the cameras supported a CCD rating between 2 and 2.3 megapixels—only two cameras in this category offered a CCD rating higher than 3 megapixels. These were the Nikon



CoolPix 885 and the Camedia 3020. Since these cameras offer far superior capabilities and performance, it would be unfair to compare them with the rest of the cameras in this category. Hence, we reviewed them separately. Besides, there aren't many such cameras available in the Indian market.

## Test methodology

We evaluated the cameras on the following parameters:

**Features:** Here we awarded points depending on the various features and capabilities of the camera, such as CCD resolution, maximum image resolution supported, optical and digital zoom, focussing types, metering modes, white balance implementation, flash modes, shutter speed, storage, battery type, video-out capabilities, etc.

The camera's features were allotted a 30 per cent weightage.

**Performance:** We tested the camera's CCD's ability to correctly reproduce colour and capture details. To do this, we created a test scene that was used as the target for all the cameras. The lighting in this scene was kept constant for all cameras. We shot this scene by mounting the camera on a tripod and chose the highest possible resolution setting that was supported by it. We used the camera's flash to shoot the scene and all other settings such as white balance, metering and flash modes were kept at their factory default.

The target scene comprised of a shot of a desktop (refer to the test image) where we introduced elements such as a wide tonal range (flowers of different colours), gradation in shading, specular highlights brought out through shiny metallic objects (the spectacles, binder and flower vase) and plenty of details (as in the lace curtain and tablecloth, the text on the stack of books, the grains in the clay of the vase). We graded each of the cameras for the level of accuracy with which each of these aspects of the image were captured.

After shooting the scene, we analysed the image at its

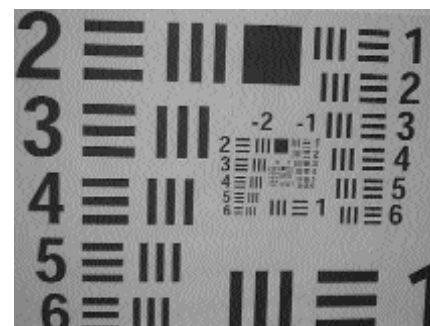
actual pixel size in Photoshop 6 using the Histogram function. This is a powerful tool that lets you analyse the level of the Red, Green, Blue and Luminosity (brightness) components in an image. With this, we logged the standard deviation that was displayed for each of these channels from a reference value. We studied the images from all cameras and the one that was the most accurate representation of the test scene was used to obtain the reference values. We then measured the standard deviation to ascertain by how much over (or under) the remainder images deviated from this optimal reference value. This test measures the accuracy of the CCD when it comes to sensing colour and brightness.

The second imaging test measured the resolution of the CCD by shooting a resolution chart, which consisted of vertical and horizontal bars of gradually decreasing sizes. We took a photograph of this chart from 1 metre away and logged how many bars could be seen in the resulting image at its actual pixel size in Photoshop.

The weightage allotted to the camera's overall performance was 30 per cent.

**Ergonomics:** We logged various aspects of the camera's construction and the inclusion of features that enhance its ease of use. This comprised of aspects such as how comfortable it was to hold, the ease with which the menu could be

navigated, the size of the buttons and the inclusion of special menu navigation buttons. Since these cameras are meant



The resolution chart

to be used outdoor very frequently, protection is very important. Hence, we looked at features such as the inclusion of a lens cover, a wrist band for preventing damage by dropping and special construction that offers water and dust resistance.

The size and weight of a digital camera are also pertinent matters to consider while choosing the right one. You'll probably be carrying the camera in your shirt pocket or handbag while travelling and you don't want to be weighed down by an ungainly device.

This category was allotted a weightage of 10 per cent.

**Warranty and support:** Here we took into account the warranty period for the digital cameras, the number of authorised service centres appointed by the companies and the number of cities in which authorised service centres are available. The information here is as provided by the respective companies.

The weightage for this category was 10 per cent.

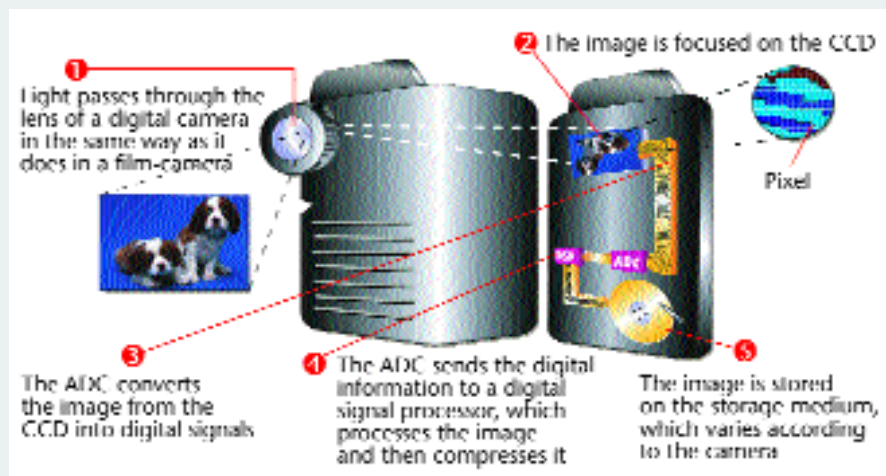
**Value for money:** This is a factor of the performance and features offered by the camera as compared to its price. Therefore, the greater the performance and features and the lower the price, the higher will be the value for money offered by a camera. We computed this value by dividing the sum of a camera's performance and features by its price to obtain a value-for-money index.

The weightage allotted to this category was 20 per cent. →



## How it Works

A digital camera works in the same manner as a conventional camera as far as optics are concerned, with one main difference—conventional cameras use film to sense and store the image while digital cameras sense the image on a CMOS or CCD element, which is a light-sensitive element that consists of millions of pixels. The CCD is an array of very tiny photo transistors that are arranged in a grid. When this grid is exposed to light, it generates electricity depending upon the intensity of light falling on it. These transistors are the smallest elements on the sensing device and they form the pixels in the image. Therefore, the greater the number of pixels on the CCD, greater will be the resolution supported and consequentially, greater is the clarity. On a monochrome digital camera, one pixel would be made up of a single transistor but in a colour digital camera, each pixel would be composed of three separate transistors, red, green and blue. Together these three colours can represent any number of colours depending upon the light falling on them.



These transistors generate continuous electrical signals that are sent to an Analog to Digital Converter (ADC) where these signals are converted to a digital format. This is then sent to a specialised processor called a DSP (Digital Signal Processor) that is programmed specifically for handling image information, where settings such as white balance, filters and image compression are performed. Finally, the image is sent to the storage memory.

Another very integral part of most digital cameras is the LCD screen that lets the user view the settings the camera is using, edit, organise and preview pictures as well as access and change the mode of its operation.

These digital images can now be viewed on an external display device such as a monitor or a television and can be downloaded to the computer using the TWAIN driver provided by the manufacturer.

## How they fared

We found a wide variation in the implementation of features and performance in the 17 cameras tested. Each price category had its own strengths—the sub-2.0 megapixel cameras provided bare bones functionality, while the 2+ megapixel cameras offered a good balance between features and performance.

### Features

At their functional core, digital cameras differ only in their CCDs and the optics used. Therefore, the primary factor that sets apart one from the other in the same category is the number of feature it includes. This is especially useful for semi-professional users who would want the maximum amount of storage possible, plenty of imaging controls, and flash and focusing modes to experiment with. Amateur users would also want features such as the ability to use the camera as a Web cam and to capture video clips.

**White balance:** In the sub-2.0 megapixel category, the camera with the maximum number of white balance settings was Olympus Camedia C-1 and Fuji FinePix A101. Each had seven white balance settings including clear sky, incandescent lamp, fluorescent as well as an

Auto setting. Though the cameras in this category did not have the ability to manually calibrate the white balance, the presets available on them introduced a very intuitive way for implementing white balance, involving minimal user intervention—something that novices at photography will appreciate.

The lower-end cameras such as the D-Link DSC-350 and the Benq DC300 did not have any means of selecting the white balance settings. Since these cameras were not capable of capturing images above a resolution of 640x480, you cannot expect them to sport advanced features like white balance and metering modes.

In the high-end category, the Fuji FinePix series had five white balance settings built into all three models, the FinePix 2800, FinePix 2600 and the FinePix A201. The camera that stood out from the pack here was the Nikon CoolPix 800, which had five presets, an auto white balance mode and also manual settings for the white balance level—invaluable to photography enthusiasts. No other camera in this roundup supported manual calibration of white balance.

**Resolution:** All the cameras in the sub-2.0 megapixel range (save the Benq DC300 and D-Link DDSC-350) sported a

native resolution of 1280x960. At this resolution you can take 4.26x3.2 inch prints at 300 dpi. The truly outstanding camera here was the Casio GV-10, which could capture images at a resolution of 1600x1200. This camera uses a Pixel Generator that effectively 'fills in' the pixels if you were to use the images for printing A4-size prints.

On the lower end of the scale, the D-Link DSC-350 and the Benq DC300 could only capture images at a resolution of 640x480 and this was attributed to the very low-density CCDs which gave them Web cam-class imaging capabilities. In fact, they just about enter the realm of digital cameras because of their small form factor, integrated memory and portability. All the 1.3 megapixel cameras in this category are suitable mostly for Web-based applications. If you need to print photographs, you would have to lower the resolution and settle for really small images; if you scale the images to fit the industry standard of 4x6 inch or higher prints, it would result in a loss in quality. The only camera that allowed such print resolutions was the Casio GV-10, though it did this through image processing.

In the 2+ megapixel category, the resolution across the cameras was primarily 1600x1200, with the exception of the





## How Much Resolution is Enough?

Digital cameras have many settings that specify the resolution at which it captures images. The questions are: which is the right resolution and is there a single best resolution? The answers depend on where you want to eventually use your images. Are you going to simply view them on a computer screen or do you want to take prints?

### Viewing on monitors:

Suppose you have a 2.1 megapixel camera which offers a maximum image resolution of 1600x1200 at 72 dpi. This means that on your monitor, you will see a full screen image if you are running your monitor at a resolution of 1600x1200, because monitors have a resolution of 72 dpi. The size of this image is obtained by scaling the dimensions of the image to the resolutions. Therefore, at 72 dpi, you would have a 22.2x16.6 inch image. This is how large



*Image of a subject created at 300 dpi. The text is sharper*

your image would appear on your Web page—quite huge.

**Print applications:** The magic resolution at which most printing happens is 300 dpi. This is the minimum you should print at for acceptable results (see the quality difference in the image)—the higher the resolution you print at, the better the quality. Therefore, for a 4x6 inch print at 300 dpi, you would need to shoot images at a resolution of 1200x1800 (multiplying the size in inches by 300). Taking the same camera as before, if you were to shoot at the highest resolution of



1600x1200, you would obtain a 5.3x4 inch print image at 300 dpi (dividing the resolution by 300). This tells you that you will definitely not be able to produce 300 dpi A4-sized (8.26x11.69 inch) prints with a 2.1 megapixel camera as it cannot capture images with a high enough resolution.

Camedia C-1 with optical zooms of 2x and 3x respectively. The Casio GV-10 and the Fuji FinePix A101 featured only 2x digital zoom functionality. The D-Link DSC-350 and the Benq DC300 did not have any zoom capability as they were based on fixed lenses.

The camera that shone in the 2+ megapixel category was the Olympus C-2100 Zoom. Offering a 10x optical zoom and an amazing 27x digital zoom, this camera can really let you get up close and personal to your subject! With such a powerful zoom, the image would tend to be shaky if no tripod is used. To counter this, the camera has an image stability feature that helps compensate for blurriness when used without a tripod.

Another camera that stood out here was the Casio QV-2800UX. It has an 8x optical zoom and 4x digital zoom and was built around a small form factor, just like the Fuji FinePix 2800 Zoom, which sports a 6x optical zoom and a 2.5x digital zoom. While not all the cameras in this category featured optical zoom capabilities, they all featured digital zoom with factors ranging from 2.5x to 5x.

**Shutter speed:** The capability to control the shutter speed of the camera lets you exercise a range of creative options. You can shoot sporting events or undertake

Kodak DX3600, which had a rather unusual 1800x1200 pixel resolution. This was due to its 2.3 megapixel CCD as compared to the other cameras in this category which had CCDs ranging between 2.11 and 2.14 megapixels. With these image resolutions, it is evident that 2+ megapixel cameras are suited to applications where you need images not bigger than post card size since they can only deliver 5.3x4 inch prints at a 300 dpi resolution.

**The optical system:** The optical system is one of the most critical parts of a digital camera—to a large degree it dictates the quality of the images captured. This is especially true when applied to the zoom function. There are two types of zoom methods used in digital cameras, optical and digital (optical zoom delivers better performance). Implementing the optical zoom feature in a camera involves precision mechanics and lens elements that subsequently increase the cost of the camera. Therefore, having an optical zoom in a camera that is reasonably priced is a very big advantage. On the other hand, the simplest and cheapest lens to implement in a camera is a 'fixed-focus' lens with no zoom function, which offers average performance in all types of focusing situations.

The two cameras that stood out in the sub-2.0 megapixel range were the Kodak EasyShare DX3215 and the Olympus

## Kodak EasyShare DX3215

Based on a 1.3 megapixel CCD, this camera embodies simplicity. It is for those who do not want to be concerned with the complexities of photography. It sports a chunky but comfortable form factor, though the protruding lens does make it rather cumbersome when kept in your shirt pocket. The Kodak Picture Software simplifies the process of working with digital images. Another very distinguishing feature is the highly graphical user interface—it was one of the most colourful and easy to understand. A switch at the back of the camera changes its mode from image playback to video recording and image capture. The camera has a video-out port located next to the USB interface. It features a 2x optical and 2x digital zoom and 8 MB of internal memory with a Compact Flash expansion slot. To transfer photos, you can connect the camera to the computer either through the USB interface or through a docking station that also serves to recharge the bundled Ni-MH batteries.



With exceedingly simple usability and very commendable performance, the Kodak DX3215 is a good choice for a first foray into the world of digital photography.

**Price:** Rs 16,800

- + Very simple controls, integrated memory with expansion slot
- Chunky design

Kodak EasyShare DX3215 B	
Features	▶ ▶ ▶ ▶ ▶
Ergonomics	▶ ▶ ▶ ▶ ▶
Performance	▶ ▶ ▶ ▶ ▶
Warranty & support	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
<b>OVERALL</b>	▶ ▶ ▶ ▶ ▶



## The Question is: Digital or Conventional?

Ever since the arrival of the multi-megapixel cameras, imaging technologists predicted the death of conventional cameras. But even though we now have digital cameras touching the 6 megapixel mark, they are still a far cry from the quality that conventional photography exhibits. However, the two sides of the digital/conventional coin have their own shortcomings and advantages.

### DIGITAL CAMERAS

- ✓ There are less moving parts and the build is sturdier
- ✓ No cost of paying for film over time
- ✓ The ability to preview images lets you retake photographs until you're satisfied
- ✓ Smaller size of CCD allows for much smaller cameras that are highly portable
- ✓ Images are not affected by X-ray machines while on vacation
- ✓ Effortless transfer to computer for further digital processes and applications
- ✗ Far more expensive than conventional cameras
- ✗ Use up batteries very quickly
- ✗ LCD screens are hard to see in bright sun light and dark environments
- ✗ Maintaining colour accuracy between the cameras and printer requires one to learn the process of colour matching

### CONVENTIONAL CAMERAS

- ✓ Far superior image quality
- ✓ Up to five times more affordable than their digital counterparts
- ✓ Easy to use and simple learning curve
- ✓ Lower cost of printing
- ✓ Longer lifespan for the prints as compared to printouts of digital images
- ✗ Film processing costs add up over time
- ✗ No way of previewing a photo; you have to pay for unsatisfactory prints
- ✗ Prints can be adversely affected by dust and scratches
- ✗ Negatives and slides are difficult to organise, store and retrieve and have the disadvantage of fading over time

capable of keeping its shutter open for up to 16 seconds. The fastest shutter speed it supported was 1/800th of a second—almost three times slower than the Casio QV-2800UX, which had the fastest shutter speed of 1/2000th of a second.

**Metering:** Very often, even with conventional cameras, the images appear slightly different from the original scene—the reds may appear too highlighted, or the overall tone of the image might be slightly dull or washed out. This happens when the exposure, shutter speed and aperture of the camera are incorrectly set for that particular scene. Most newer cameras incorporate advanced systems that are capable of setting these parameters perfectly in accordance with the focusing system depending upon the type of scene, be it a portrait, a landscape, or a close-up. This is known as metering. It lets the camera decide which areas of the photo to focus on. There are three modes of metering: spot metering, center-weighted metering, and matrix metering (see 'Jargon Buster').

In the sub-2.0 megapixel cameras, there was no way one could invoke these modes manually. The camera that implemented metering very well, as proved by the level of detail in the resultant image, was the Kodak EasyShare DX3215. A worthy second was the Fuji FinePix A101, which implemented a 64-zone metering system, producing very good imaging results.

The situation was markedly different in the 2+ megapixel category. The Nikon CoolPix 775 implemented metering very effectively. It used a 256-zone metering system, producing very sharp images. All

night time photography and include motion blur in your photographs. Most digital cameras offered shutter speeds ranging from half a second to 1/1000 second. Some high-end cameras even allow users to manually select from a range of shutter speed settings.

In the sub-2.0 megapixel category, the Casio GV-10 offered the best range of

shutter speeds, from 1 second to 1/1500th of a second. This would make the camera a good choice for shooting outdoor sporting events—you would see no blur in the photos. The D-Link DSC-350, the Benq DC300 and the Logitech ClickSmart 510 had a fixed shutter speed with no range to select from.

In the 2+ megapixel category, the Olympus Camedia 2100 Ultra Zoom was



## Fuji FinePix A101

One of the smallest 1.3 megapixel cameras available, the Fuji FinePix A101 sports everything from a 1.6-inch TFT to USB connectivity and even the capability to record small video clips. The camera is very small and fits snugly in your pocket. With a maximum resolution

of 1280x1024, it is ideal for sharing images on the Web. It features a 2x digital zoom and the image quality is surprisingly good for a fixed focus camera. This camera offers three modes of operation—image capture, video recording and image playback. Also impressive is the menu navigation system that can be

controlled by the four-directional switch to change the resolution, flash modes and white balance. One very interesting feature here is the ability to zoom into the picture in the playback mode and even pan around while viewing it. Memory is in the form of a 16 MB Smart Media card.

The camera has everything you would need for basic photography and comes at a good price. Though not too heavy on features, it provides good performance that would rival even some of the more expensive ones.

**Price:** Rs 16,929

Fuji FinePix A101	
Features	▶▶▶▶▶
Ergonomics	▶▶▶▶▶
Performance	▶▶▶▶▶
Warranty & support	▶▶▶▶▶
Value for money	▶▶▶▶▶
<b>OVERALL</b>	▶▶▶▶▶

- + Compact form factor, options to control flash and white balance
- Rather limited maximum resolution of 1280x1024



the cameras in this category allowed for manually setting the metering mode. The Nikon CoolPix 800 stood out here—there was no other camera that allowed the level of freedom in choosing and manually setting the various imaging parameters as this one.

**Memory:** All the cameras in the sub-2.0 megapixel category included 8 MB of memory. Some of them like the D-Link DSC-350, the Benq DC 300 and the Kodak EasyShare DX3215 have the memory integrated into the device, while the others were based upon the Smart Media or Compact Flash format. They all stored images in JPEG format with the exception of the D-Link DSC-350, which stored images in BMP format. Five out of the seven cameras supported Web cam capability—a definite thumbs up for home users.

In the 2+ megapixel category, the majority of cameras bundled 8 MB of either Smart Media or Compact Flash-based memory systems. The exceptions were Fuji FinePix 2800, FinePix A201 and Nikon CoolPix 775, which bundled 16 MB of memory. Interestingly, the Kodak EasyShare DX3600 integrated its 8 MB of memory in the camera itself, with an option of upgrading it via a



## Casio GV-10

The Casio GV-10 completely revolutionises the perception of a digital camera being delicate and fragile. There are rubber-lined enclosures for the delicate components and the circuitry inside is encased in a special gel. The company claims that it is resistant to water even if immersed to a depth of 1 metre for 30 minutes and if sprayed from all directions. It is also dust-resistant.

This 1.23 megapixel camera features a 2.5x digital zoom, a 1.6-inch TFT screen, the ability to record video clips and has 8 MB of Compact Flash memory. This camera creates photos at a native resolution of 1280x960 but a software mode hikes this up to 1600x1200 by using interpolation. The 'Best Shot' mode has a set of 18 scenes stored in the camera—you can choose the one that most closely matches the scene you want to shoot and the camera takes care of adjusting all other parameters such as exposure, flash mode and metering. The bundled software detects when the camera has been connected via its USB interface and automatically transfers images from the camera to your computer. This camera is sturdily built and offers a decent set of features.

**Price:** Rs 26,995

- + Resistant to water and dust, very intuitive method of shooting photos through the 'Best Shot' mode
- No optical zoom, uses software interpolation to obtain its highest resolution

Casio GV-10		B
Features	▶▶▶▶▶▶▶▶	
Ergonomics	▶▶▶▶▶▶▶▶	
Performance	▶▶▶▶▶▶▶▶	
Warranty & support	▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶	
<b>OVERALL</b>	▶▶▶▶▶▶▶▶	

Compact Flash interface. The Sony CyberShot DSC-P31 expectedly used Sony's own proprietary Memory Stick format.

### Ergonomics

Since cameras are meant to be carried around, they are going to spend a large part of their useable life in your palm. Therefore, it becomes very important that the construction and the implementation of the various features is simple, intuitive and comfortable to use. This depends on the way the camera's body is moulded, the placement of the buttons and of course, its size and weight.

In the sub-2.0 megapixel category, the Logitech 510 was the smallest and lightest camera, followed closely by the Olympus Camedia C-1. The largest camera was the Kodak EasyShare DX3215. Also it has a protruding lens barrel, which makes it uncomfortable to carry.

One of the most commendable cameras as far as navigating and understanding the menu goes, was the Kodak EasyShare DX3215 Zoom. It featured the most colourful and easy-to-understand menu and the large icons made it very simple to understand what each menu function means. On the other hand, the Casio GV-10 had many buttons scattered on the top and back panel and it takes some getting used to it.

All of the cameras came with a wrist strap bundled as standard equipment. A worthy mention here is the Casio GV-10. With its tough body and rubber grips, it



## Maximising Memory Performance

The storage medium that most cameras use is of the Flash memory type. This technology provides for storage capacities ranging from 4 MB all the way to 512 MB. Flash memory is a great choice because it is available in very small form factors and is able to hold information even after the equipment is switched off. However, this technology does not come cheap. You can expect to spend about Rs 10,000 for a 64 MB Flash memory card.

There are three primary types of Flash memory in use today with digital cameras based on their form factor:

**Smart Media:** The main advantage with this format is size. The card is about as thin as a cellular phone SIM card and is a little over 1 square inch in size.

**Compact Flash:** Here, the packaging of the Flash memory is considerably more robust and is about the same breadth and width as the Smart Media, except that it is thicker due to the plastic packaging.

**Memory Stick:** This is a proprietary Flash memory format that is propounded and used by Sony products and is about the size of half a stick of chewing gum.

Since all forms of flash memory are delicate, you have to take care that they last and deliver error-free performance. In Smart Media, the contacts are exposed and therefore it is important to see that they are free from dirt and scratches. Store these cards in their plastic jackets to prevent damage. Do not subject them to undue physical shock and store them away from extremes in temperature, humidity and moisture.

The best way to fully utilise the storage capacity in these devices is to control the resolution at which you take your photos. Digital cameras allow you to change the image resolution on the fly. Therefore, if you want to pack in more images, use only as large a resolution as you require and allot smaller resolutions to images that are less important.



## Jargon Buster

**Burst mode:** This mode of photography enables the camera to capture a series of photos in succession for as long as the shutter release button is depressed. Burst mode rates are usually in the range of 1.5 up to 5 frames per second.

**CCD sensor:** The Charge Coupled Device forms the core of a digital camera's imaging capability and is the digital equivalent of the retina. It is composed of a matrix of colour sensing elements that are packed into a sensor. It is these elements that are referred to when you hear terms like '2.3 megapixel camera'. The greater the number of pixels on the CCD, the greater is the camera's effective resolution.

**Focal length:** This is the effective focal length of the objective lens of the camera and it is specified as a range (say, 35 mm to 70 mm). Most digital cameras feature one of two types of focusing methods—fixed and auto focus. Most low-end cameras have fixed focus lenses with preset ranges such as landscape and portrait. This delivers reasonable quality but the better option is auto focusing where cameras use infrared beams that sense the distance of the target in front of the camera and automatically adjust the focus. You see this in action even in conventional cameras when you half-depress the shutter release button, bringing the image into sharp focus.

**f-stop:** The ratio of the focal length of the camera's lens to the diameter of the aperture in millimeters. 'Stop' is the generic term

used for the amount of light reaching the sensor or film. The light reaching the sensor is doubled or halved by changing one neighbouring value in f-stop, shutter speed or film speed. For example, an f-stop setting of f5.6 will allow double the amount of light to reach the sensor as compared to when it's set at f8 (the next incremental step).

**ISO settings:** ISO is essentially the sensitivity of conventional film to light. Doubling the ISO value will double the film's sensitivity, which means that ISO 200 is twice as sensitive to light as ISO 100. Therefore, when used in relation to digital cameras, this setting mimics a conventional camera's sensitivity to light.

**Metering:** A process that cameras use for determining which part of the frame to assign more weightage to when focussing. Today's cameras divide the view field into zones and figure out which areas are more prominent by evaluating nearness of the subject along with the total area occupied by the target in the frame, the brightness, contrast and colour in the scene, etc. The greater the number of zones, the more accurate the focussing will be. There are three kinds of metering systems used—(i) spot metering, where the subject at the centre of the frame is assigned maximum weightage for focus; (ii) matrix metering, where the frame is divided into areas that are compared to pre-defined 'focussing situations' stored in the camera and a suitable focusing method is applied accordingly;

(iii) centre-weighted metering (the default method), where the maximum focussing weightage is assigned to the central area of the frame and is used in situations like group photographs.

**Red-eye reduction:** A reflection of the camera's flash when a person's pupils are dilated results in a 'red eye' in the final picture. Cameras overcome this by firing a burst of flashes, which cause the subject's pupils to contract, and thus eliminate this effect.

**Shutter speed:** The time for which the shutter remains open to let the light pass through the lens to the sensor or film. Shutter speeds are generally around one-fourth of a second in most digital cameras at factory settings. If you are shooting fast moving objects, the shutter speed needs to be increased, else there will be a lot of motion blur in the target object. Many cameras offer shutter speeds as high as 1/1500 second to as low as 16 seconds.

**White balance:** This is simply the process of matching the camera's perception of white to what is really white. For example, a white sheet of paper would appear bluish in morning light and reddish at dusk. All digital cameras now come with automatic white balance where the camera guesses the kind of white compensation necessary depending on the colour and the intensity of the ambient light. There are also manual settings such as cloudy, sunny, indoor, twilight, etc if you want greater control over the white balancing of your camera.

is comfortable to hold and is also water and dust resistant.

In the 2+ megapixel category, the Kodak EasyShare DX3600 Zoom had the best menu navigation. Thanks to the self-explanatory menu buttons, novices can get used to it very quickly. The Olympus Camedia 2100 Ultra Zoom, on the other hand, was a bit difficult to learn and you would need to spend more time with the manual. In terms of looks, however, this camera is truly an eye-catcher, though it was larger and significantly heavier than the other cameras.

Some models like Fuji FinePix 2600 Zoom and Fuji FinePix 2800 Zoom had circular buttons that could be used directionally, making it easy to navigate through the menu. Apart from being very functional, these buttons also look really good compared to standard buttons.

## Performance

No matter what features and capabilities the camera boasts, the final proof lies in the image it captures. To measure the imaging performance of the camera, we used a specially compiled test scene that brought out the capability of the camera to faithfully capture colour, brightness, detail and light effects (see 'Test Process').

**Scene test (details):** Here we subjectively evaluated the ability of the camera to pick up the various details in our test scene.

In the sub-2.0 megapixel range, the first area of details that we looked out for in the test image was the date (16th) on the desktop calendar. In this test, the only two cameras that could pick out this detail were the Kodak EasyShare DX3215 and the Olympus Camedia C-1 Zoom. Both produced a sharp result in this test where the date

showed up clearly. None of the other cameras were able to pick up this detail—especially poor were the Logitech ClickSmart 510 and the Benq DC300. All that could be seen with them was a pixellated patch in place of the number. The one camera that did a very good job in picking up the droplets of water on the flowers in the image was the Fuji FinePix A101. Compared to the other cameras in this category, the colour reproduction was very faithful to the original. The nearest rival to the Fuji FinePix A101 was the Kodak EasyShare DX3215, which also showed faithful reproduction of colours and a good level of detail. The Logitech ClickSmart 510 performed very poorly in this test—it picked out very low overall details.

Surprisingly, the Olympus Camedia C-1 Zoom fared rather badly here. This camera falls in the higher end of the





## Tricks to be a Sharp Shooter

- Brace yourself and avoid excessive hand movement to get those sharp photos. The camera needs to be stable to get a good focus, and adjust the white balance and metering.
- When on the road, remember to carry many sets of batteries or invest in rechargeable ones—digital cameras have a way of chewing through batteries and you wouldn't want to miss a great photo opportunity.
- Use the flash wisely. In bright sunlight, where parts of your subject might be darker, use 'flash fill' to brighten up the darker areas for a balanced photo. Flashes only have a range of up to 10–12 feet so don't bother using it for objects farther than this. Use red-eye reduction to get rid of the monster-glow eyes.
- The overall tone of a photo looks different in certain kinds of lighting. Experiment with the white balance and if you want more

- natural colours, manually set the white balance to match the scene before you shoot.
- For portrait shots, eliminate a 'crowded' background, as this tends to take away the attention from the subject. Either move to a more neutral background or adjust the f-stops to the widest setting possible so that the background is as out of focus as possible—this creates stunning clarity for the main subject.
- Use the Flash-fill mode, especially when shooting portraits as this eliminates harsh shadows on the subject. Avoid such shots at high noon as this creates very harsh shadows.
- Flash reflectors are great for filling out harsh shadows. You can use a simple car window reflector as a flash reflector or even a white card that's about 2 square feet. Reflect light on the subject's face to eliminate shadows and you will have great portraits.

on the flower, all the cameras were able to achieve this without a problem with the Olympus Camedia 2100 Ultra Zoom and Fuji FinePix A201 exhibiting breathtaking clarity.

The three cameras in this category that were not able to pick up the detail of the text on the spine of the book were the Casio QV-2800UX, the Kodak EasyShare DX3600 and the Sony CyberShot DSC-P31. These cameras registered an unreadable blur while the others were able to pick up this detail well.

The lace details on the background of the image was also faithfully picked up by all the cameras without a hitch. Finally, all cameras in this category except the Kodak EasyShare DX3600, the Sony CyberShot DSC-P31 and the Casio QV-2800UX were able to pick up the details on the fruit.

**Specular effect and gradation in shading:** For this test we noted two interesting effects in the test scene—the specular effect (light shining off metallic surfaces) and gradations in shading in the scene.

In the sub-2.0 megapixel category, the Fuji FinePix A101 returned a very good specular effect on the spectacles and the metallic binder on the desktop calendar. The Kodak EasyShare DX3215 was perfect as far as gradation in shading went but

sub-2.0 megapixel category but was unable to pick up the droplets of water on the flower reliably. Also, the overall image looked slightly washed out and lighter than the original as compared to the other cameras.

We then evaluated the capability of the camera to pick up the text on the spine of one book (refer to the test scene image). This was a particularly difficult detail to reproduce as it involved picking up very small-sized text. In this category, only the Kodak EasyShare DX3215 was able to successfully show this detail, while this was virtually impossible to read with the rest of the cameras.

The next region we looked at was the design pattern on the lace curtain. We observed this area for signs of the edge of the pattern merging with the adjoining areas. The only cameras in the sub-2.0 megapixel category that did show this properly were the Kodak EasyShare DX3215 and the Fuji FinePix A101.

In the final area, the cameras that could manage to pick up the details of the fruit were the Kodak EasyShare 3215, the Fuji FinePix A101 and the Casio GV-10.

In the 2+ megapixel category, there was a very noticeable improvement in the performance of the cameras—all of them except the Nikon CoolPix 775 and the Sony CyberShot DSC-P31 were able to pick up the number 16 on the desktop

calendar. The exceptional performer here was the Olympus Camedia C-2100 Ultra Zoom with its 1600x1200 image resolution—the numerals on the calendar were vivid, sharp and clearly readable.

As for picking up the droplets of water

## Fuji FinePix A201

Very similar to its predecessor, the FinePix A101, in construction and looks, the Fuji FinePix A201 features an enhanced 2.1 megapixel CCD and a 2.5x digital zoom. This one also uses the same menu structure as the FinePix A101. It has a 1.6-inch TFT and sports a very simple and intuitive approach to controlling the functions and parameters of the camera. It has a 16 MB Smart Media card and is powered by two AA alkaline batteries. This camera can store images at a native resolution of 1600x1200, which allows you to print post card sized images at 300 dpi. These images are stored in JPEG format and are transferred to the computer via the USB interface. You can either use the bundled software to download these images, or simply drag and drop them from Windows Explorer as the camera shows up as a drive when connected! The rest of the controls for zoom, menu navigation and modes of operation (playback, image capture and video capture) are identical to the FinePix A101. Best of all, this one costs just Rs 2,000 more than its predecessor.

All in all, this camera offers good features and image quality.

**Price:** Rs 19,705

Fuji FinePix A201	
Features	▶▶▶▶▶▶
Ergonomics	▶▶▶▶▶▶
Performance	▶▶▶▶▶▶
Warranty & support	▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶
<b>OVERALL</b>	▶▶▶▶▶▶

**B+**

- + Very good image quality, small form factor
- No optical zoom





## Olympus Camedia C-2

Characterised by the sliding door that covers the lens, the Olympus Camedia C-2 looks classy with its silver and champagne gold colour combination. It is based on a 2.14 megapixel CCD that lets it store images at a resolution of 1600x1200. This is a point-and-shoot camera—there are very few parameters that can be manually overridden. It features vari-

ous flash modes such as auto, red-eye reduction, slow synchro and off. The white balance modes supported are sunny, cloudy, fluorescent, incandescent and auto. The camera has an 8 MB Smart Media card and is powered by a pair of AA batteries, but Olympus should have provided for Ni-MH batteries instead, as

the AA batteries tend to get used up very quickly. There is a 1.6-inch LCD screen that previews the image and also displays the menu through which you can control the various parameters of the camera. However, the menu structure is rather difficult to get used to. The camera has a USB interface to facilitate quick transfer of images to a computer. The package also bundles the Camedia software, which is used for image transfer.

Though manual settings are missing, the camera offers good functionality and provides for some high-quality photographs.

**Price:** Rs 18,000

Olympus Camedia C-2 B+	
Features	▶▶▶▶▶▶▶▶▶▶
Ergonomy	▶▶▶▶▶▶▶▶▶▶
Performance	▶▶▶▶▶▶▶▶▶▶
Warranty & support	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶
<b>OVERALL</b>	▶▶▶▶▶▶▶▶▶▶

- + Simple point-and-shoot functionality
- No optical zoom, takes time to get used to the menu system

lost to the Fuji in reproducing the specular effect. The camera which did not manage to score anything here was the Benq DC300. It filled most of the image with light, therefore eliminating any specular effects in the scene.

Among the 2+ megapixel cameras, the Fuji FinePix A201 came out tops in spite of tough competition from the Olympus Camedia 2100 Ultra Zoom. Although all cameras managed to do well in these two tests, some models like the Nikon CoolPix 775 and Sony DSC-P31 performed below par in the test for gradation in shading.

**The Resolution test:** The second test for details was with the resolution chart (see 'Test Process').

In the sub-2.0 megapixel range of cameras, the one that stood out was the Casio GV-10. It managed to pick up four out of the five patterns of lines clearly. The Logitech 510, the Olympus Camedia C-1 and the Benq DC300 performed sub-par—all three picked out just two of the five patterns. The rest of the cameras in this category picked up three out of the five areas on the resolution chart.

In the 2+ megapixel category, all cameras picked up four out of the five patterns with the exception of the Casio QV-2800UX, which managed just three.

### Warranty

Digital cameras are very expensive devices. To add to this, they are not going to be kept in the safety of one's home—they are meant to lead a life outdoors. Therefore, the chances of something going wrong are higher and

warranty and after sales support become very important. Unfortunately, we found that the after sales support offered by a majority of these companies is disappointing, in terms of the number of service centres and the number of cities in which they have authorised service centres. Also, all the digital cameras came with a standard one-year warranty.

The overall and undisputed winner in this category was Sony with a staggering

infrastructure of 97 service centres in 28 cities. Benq and D-Link also have a good service network each comprising of 22 centres spread across 19 cities. Most of the other companies had less than five service centres across the country in about the same number of cities. Companies such as Nikon and Fuji have just one service centre in Mumbai. With such expensive devices, it becomes critically important to have proper support for them.

## Nikon CoolPix 800

This camera abounds with features and a plethora of options for controlling virtually any imaging parameter you might want to. Based upon a 2.11 megapixel CCD, this camera has a 2x optical Nikon zoom lens that boasts of amazing clarity. This was very evident in its brilliant performance. It supports a native resolution of 1600x1200 and was the only camera that could store images in TIFF format as well. It has a comparatively large 1.8-inch LCD screen and features numerous imaging modes such as matrix, spot and centre-weighted with multiple white balance and flash modes. The camera settings can also be manually overridden and it was the only camera in this test that also had a manual focus. The camera also features a mono LCD display that displays the current mode of operation of the camera. However, there is no USB support—you have to transfer images through the serial port.



The Nikon CoolPix 800 gives you plenty of options for fully automatic as well as manual operation—all these control options make this camera a great choice for the serious photographer.

**Price:** Rs 19,560

Nikon CoolPix 800 A-	
Features	▶▶▶▶▶▶▶▶▶▶
Ergonomy	▶▶▶▶▶▶▶▶▶▶
Performance	▶▶▶▶▶▶▶▶▶▶
Warranty & support	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶
<b>OVERALL</b>	▶▶▶▶▶▶▶▶▶▶

- + Very powerful manual control for virtually every imaging parameter, brilliant image quality
- Serial interface, too many buttons for controlling the various features





ATEGORY	SUB 2.0 MEGAPIXEL CCD							
MODEL	Benq DC300	Casio GV-10	D-Link DSC-350	Fuji FinePix A101	Kodak EasyShare DX3215	Logitech ClickSmart 510	Olympus Camedia C-1	Casio QV-2800
FEATURES								
Max Image resolution	640 x 480	1600 x 1200	640 x 480	1280 x 1024	1280 x 960	1280 x 960	1280 x 960	1600 x 1200
CCD Sensor (Megapixels)	350 K	1.3	350 K	1.3	1.3	1.3	1.31	2.11
Optical length (mm)	NA	35	35	36	30-60	40-91	38-114	40-320
Optical Zoom/Digital Zoom	NA/NA	NA/2x	NA/NA	NA/2x	2x/2x	NA/NA	3x/NA	8x/4x
Viewfinder (Optical/LCD)	✓ ✗	✓ ✓	✓ ✗	✓ ✓	✓ ✓	✓ ✗	✓ ✓	✓ ✓
White balance settings	NA	Auto, 4 Presets	Auto	Auto, 7 Presets	Auto	NA	Full-auto TTL, 3 Presets (Clear sky, Incandescent lamp and Fluorescent lamp)	4 Presets, manual
Shutter speed range (secs)	NA	1 to 1/1500	NA	1/2 to 1/1000	1/4 to 1/1000	NA	1/2 to 1/1000	1 to 1/2000
Metering modes	NA	Center weighted by imaging element	NA	64-zone TTL, Program AE	Auto	NA	Digital ESP using image pickup device	Multi-pattern, Center weighted, Spot
Flash modes	Auto, Off	Auto, On, Off	Auto, Fill, Off	Auto, Red-Eye Reduction, On, Off, Slow Synchro	Auto, Fill, Red-Eye Reduction, Off	Auto, Fill, Off	Auto, Red-Eye Reduction, Fill, Night, Off	Auto, On, Red-Eye Reduction, Off
Memory types, Size (MB)	Internal, 8	Compact Flash, 8	Internal, 8	Smart Media, 8	Internal, 8	Smart Media, 8	Smart Media, 8	Compact Flash, 8
Image format	JPEG	JPEG	BMP	JPEG	JPEG	JPEG	JPEG	JPEG
PC Interface	USB	USB	USB	USB	USB	USB	USB	USB
Video Out Support	✗	✗	✗	✗	✓	✗	✓	✓
Burst mode rate (frames/sec)	NA	✓ (No details)	NA	NA	NA	1	4	NA
Movie capability (Format)	✗	AVI	AVI	✗	MOV	AVI	AVI	AVI
Webcam capability	✓	✓	✓	✓	✗	✓	✗	✗
Battery Type, Form Factor	Alkaline, AAA	Alkaline, AA	Alkaline, AA	Alkaline, AA	Alkaline, AA	Alkaline, AA	Alkaline, AA	Alkaline, AA
Battery charger, Remote Control	✗ ✗	✗ ✗	✗ ✗	✗ ✗	✗ ✗	✗ ✗	✗ ✗	✗ ✓
OS compatibility	Windows	Windows, Mac	Windows	Windows	Windows	Windows, Mac	Windows	Windows, Mac
PERFORMANCE								
Colour Deviation in Photoshop 6.0 *								
Red / Green / Blue	75.91/80.96/83.43	47.73/47.24/48.79	69.89/77.55/80.46	56.42/57.53/59.50	48.93/53.85/56.85	55.38/58.75/67.82	51.75/49.12/38.48	48.07/51.31/53.39
Luminosity	78.19	45.71	73.22	55.24	50.26	52.69	46.45	49.16
Specular Effect **	0	1	0	2	1	0	1	2
Irradiation in shading ***	0	1	0	2	2	0	0	2
Details Visibility (Scale of 5)	0	1	0	3	5	0	1	3
Date on calendar (Y/N)	✗	✗	✗	✗	✓	✗	✓	✓
Droplets on flower (Y/N)	✗	✗	✗	✓	✓	✗	✗	✓
Text on book (Y/N)	✗	✗	✗	✗	✓	✗	✗	✗
Curtain's lace pattern (Y/N)	✗	✗	✗	✓	✓	✗	✗	✓
Details on fruit (Y/N)	✗	✓	✗	✓	✓	✗	✗	✗
Resolution test (Scale of 5)	2	4	3	3	3	2	2	3
ERGONOMICS								
Dimensions (l x w x d) cms	5.7 x 8.89 x 2.03	7.4 x 10.05 x 4.9	7.2 x 3.5 x 10.8	9.9 x 6.35 x 4.06	12.19 x 6.8 x 4.57	11.43 x 8.89 x 3.81	11.17 x 6.09 x 3.55	8.12 x 12.19 x 6.6
Weight (grams)	250	250	200	145	220	160	185	295
Design (Scale of 5)								
Comfortable to hold	3	4	3	3	4	4	3	3
Menu navigation ease	5	3	5	4	4	5	3	2
Comfortably sized buttons	1	2	1	2	2	2	1	2
Special menu navigation buttons	✗	✗	✗	✓	✓	✗	✓	✗
Protection								
Lens cover	✗	✓	✗	✓	✓	✗	✓	✓
Wrist band	✓	✓	✓	✓	✓	✗	✓	✓
Splash resistant	✗	✓	✗	✗	✗	✓	✗	✓
WARRANTY & SUPPORT								
Number of authorised service centres	21	1	22	1	5	12	2	1
Number of cities where service centres are present	21	1	19	1	5	12	1	1
Period of warranty (Years)	1	1	1	1	1	1	1	1
OVERALL SCORE								
Features (30%)	4.89	14.41	9.21	15.36	13.97	11.93	16.39	22.55
Ergonomics (10%)	5.45	8.05	5.45	7.05	7.45	8.1	6.4	7.5
Performance (30%)	5.91	18.75	8.69	19.48	21.31	9.64	13.22	20.67
Warranty & Support (10%)	8	4.5	8	4.5	4.5	8	4.5	4.5
Value for Money (20%)	11.43	8.77	18.27	14.7	15	10.27	13.22	7.35
Overall	35.68	54.48	49.62	61.09	62.23	47.94	53.73	62.57
Overall Product Rating	C+	B	B-	B	B	B-	B	B
Endor name	Benq	Casio India Company Ltd	D-Link India Ltd	Jindal Photo Films Ltd	Neoteric Infomatique	Rashi Peripherals	Komal International	Casio India Company Ltd
Phone	022-5705230	011-6534537	022-6902210	022-8514441	022-4172600	022-8260258	022-2614015	011-6534537
E-mail	pankajpamani@benq.com	ashishj@casiointia-company.com	ssehgal@dlink-india.com	K_Mohan/JPL@jindals.com	sales@neoteric-info.com	ho@rptechindia.com	indiaolympus@vsnl.com	ashishj@casiointia-company.com
Price (Rs)	6,750	26,995	7,000	16,929	16,800	15,000	16,000	42,000

Reference standard deviation values: 43.0/48.0/47.0/43.0 (Red/Green/Blue/Luminosity). The greater the deviation from these values, the poorer the performance

\* 0: Very blurry, 1: Average, 2: Sharp

\*\* 0: Not visible, 1: Slightly visible, 2: Clearly visible



2.0+MEGAPIXEL CCD								
Fuji FinePix 2600 Zoom	Fuji FinePix 2800 Zoom	Fuji FinePix A201	Kodak EasyShare DX3600	Nikon CoolPix 775	Nikon CoolPix 800	Olympus Camedia C-2100 Ultra Zoom	Olympus Camedia C-2	Sony CyberShot DSC-P31
1600 x 1200 2.11 38-114 3x/2.5x ✓✓ Auto, 4 Presets (Sunny, Shady, Fluorescent, Incandescent) 1/2 to 1/1000 64-zone TTL, Spot, Auto Auto, Red-Eye Reduction, Forced, Suppressed, Slow Synchro Smart Media, 16 JPEG USB ✗ ✗ AVI ✓ Ni-MH, AA ✓✗ Windows, Mac	1600 x 1200 2.11 38-228 6x/2.5x ✓✓ Auto, 4 Presets (Sunny, Shady, Fluorescent, Incandescent) 1/2 to 1/1500 64-zone TTL, Auto, Spot Auto, Red-Eye Reduction, On, Off, Slow Synchro Smart Media, 16 JPEG USB ✗ 5 AVI ✓ Ni-MH, AA ✓✗ Windows	1600 x 1200 2.11 36 NA/2.5x ✓✓ Auto, 4 Presets (Sunny, Shady, Fluorescent, Incandescent) 1/2 to 1/1000 64-zone TTL Auto, Red-Eye Reduction, On, Off, Slow Synchro Smart Media, 16 JPEG USB ✗ ✗ AVI ✓ Ni-MH, AA ✓✗ Windows	1800 x 1200 2.3 35-75 2x/3x ✓✓ Auto 1/8 to 1/1200 Auto Auto, Fill, Red-Eye Reduction, Off Internal, 8 JPEG USB ✓ ✗ MOV ✗ Ni-MH, AA ✓✗ Windows, Mac	1600 x 1200 2.14 38-115 3x/2.5x ✓✓ Auto, 5 Presets, hold 1 to 1/1000 256-zone Matrix Auto, Red-Eye Reduction, Fill, Slow Synchro Compact Flash, 16 JPEG USB ✓ 0.8 MOV ✗ Li-Ion, AA ✓✗ Windows, Mac	1600 x 1200 2.11 38-76 2x/2.5x ✓✓ Auto, 5 Presets, manual 8 to 1/750 Matrix, Spot, Center weighted Auto, Red-Eye Reduction, Off Compact Flash, 8 JPEG, TIFF Serial ✓ 1.45 MOV ✗ Alkaline, AA ✗✗ Windows, Mac	1600 x 1200 2.11 38-380 10x/27x ✗✓ Auto, 4 Presets (Daylight, Tungsten, Fluorescent, Over-cast) 16 to 1/800 Digital ESP, Center weighted, Spot Auto, Red-Eye Reduction, Off, Fill, Slow Synchro, Red-Eye Reduction w/ Slow Synchro Smart Media, 8 JPEG USB ✓ 1.7 AVI ✗ Alkaline, AA ✗✗ Windows, Mac	1600 x 1200 2.14 36 NA/5x ✓✓ Auto, 4 Presets (Sunny, Cloudy, Incandescent, Fluorescent) 1/2 to 1/800 Digital ESP, Spot Auto, Red-Eye Reduction On, Off, Slow Synchro Smart Media, 8 JPEG USB ✗ 1.3 AVI ✗ Alkaline, AA ✗✗ Windows	1600 x 1200 2.11 33 NA/3x ✓✓ Auto, 4 Presets (Daylight, Cloudy, Fluorescent, Incandescent) 2 to 1/1000 Multi-pattern, Spot Auto, Auto w/ Red Eye Reduction, On, On w/ Red-Eye Reduction, Off Memory Stick, 8 JPEG USB ✓ ✗ MPEG ✗ Ni-MH, AA ✓✗ Windows, Mac
53.54/54.4/62.15 52.37 2 2 5 ✓ ✓ ✓ ✓ ✓ 4	45.66/46.63/49.15 44.22 2 2 5 ✓ ✓ ✓ ✓ ✓ 4	51.53/52.99/58.26 50.02 2 2 5 ✓ ✓ ✓ ✓ ✓ 4	53.26/57.16/59.97 53.9 1 1 3 ✓ ✓ ✗ ✓ ✗ 4	40.03/44.73/47.35 41.29 1 2 4 ✗ ✓ ✓ ✓ ✓ 4	37.97/43.69/49.11 40.36 2 2 5 ✓ ✓ ✓ ✓ ✓ 4	43.95/47.2/48.31 43.31 2 2 5 ✓ ✓ ✓ ✓ ✓ 4	48.81/50.79/52.06 47.95 2 2 5 ✓ ✓ ✓ ✓ ✓ 4	52.82/54.38/54.64 52.26 1 0 2 ✗ ✓ ✗ ✓ ✗ 4
9.9 x 6.6 x 5.33 200 3 3 1 ✓ ✓ ✓ ✗	9.3 x 7.62 x 7.11 269 4 4 1 ✓ ✓ ✓ ✗	9.9 x 6.35 x 4.06 145 3 4 2 ✓ ✓ ✓ ✗	11.93 x 7.36 x 5.08 230 4 4 2 ✓ ✓ ✗ ✗	8.63 x 6.6 x 4.31 185 4 4 2 ✓ ✓ ✓ ✗	11.93 x 6.85 x 6.09 280 4 3 2 ✗ ✓ ✓ ✗	11.17 x 7.87 x 14.22 632 4 3 2 ✓ ✓ ✓ ✗	6.09 x 10.9 x 3.81 165 3 3 2 ✓ ✓ ✓ ✗	10.66 x 5.84 x 4.06 231 4 4 1 ✓ ✓ ✓ ✗
1 1 1	1 1 1	1 1 1	5 5 1	1 1 1	1 1 1	2 1 1	2 1 1	97 28 1
19.45 6.15 24.16 4.5 10.79 65.05 B+	21.24 7.2 25.69 4.5 9.9 68.53 B+	18.35 7.8 24.6 4.5 15.57 70.82 B+	15.84 7.95 19.68 5.5 10.15 59.12 B	20.48 7.95 23.43 4.5 13.21 69.57 B+	18.75 7.3 25.37 4.5 16.11 72.03 A+	21.28 7.8 25.85 4.5 7.32 66.75 B+	17.06 7.4 25.17 4.5 16.76 70.89 B+	18.09 7.2 17.83 8 12.83 63.95 B+
Jindal Photo Films Ltd 022-8514441 K_Mohan/JPL@jindals.com 28,215	Jindal Photo Films Ltd 022-8514441 K_Mohan/JPL@jindals.com 33,858	Jindal Photo Films Ltd 022-8514441 K_Mohan/JPL@jindals.com 19,705	Neoteric Infomatique 022-4172600 sales@neoteric-info.com 25,000	Antrix Tech Zone 022-8061531 antrix@vsnl.net 23,750	Antrix Tech Zone 022-8061531 antrix@vsnl.net 19,560	Komal International 022-2614015 indiaolympus@vsnl.com 46,000	Komal International 022-2614015 indiaolympus@vsnl.com 18,000	Best International 022-2611050 bestint@vsnl.com 19,990



## The Big Guys

For this comparison, we invited cameras up to 3.5 megapixels from a total of nine vendors and were surprised to find the current state of the digital camera market: the most popular digital cameras available today lie in the 2 to 2.5 megapixel range. There is also a sizeable number of camera models in the sub-2.0 megapixel range, but these are squarely for the novice user. Therefore when we received two cameras that sported CCDs in excess of 3-megapixels, we could not stack them up against the rest of the cameras as they were in a totally different league in terms of price, features, performance and functionality. These were the Nikon CoolPix 885 (3.37 megapixels) and the Olympus Camedia C-3020 (3.3 megapixels).

With the increased CCD density, the maximum resolution is immediately notched up to allow them to handle photo printing applications with greater ease. Even though both cameras have numerous manual control features, they can still be used as point-and-shoot devices. They still support only fixed lenses but have other nifty extras like video clip recording and preset scene modes. These cameras allow you to control all the parameters of photography and can even store images in TIFF format.

### Nikon CoolPix 885

With a 3.37 megapixel CCD, the Nikon CoolPix 885 is built upon a surprisingly small form factor and features some of the most comprehensive settings available for imaging. With metering mode options such as matrix, centre weighted, spot and spot AF, and the five-mode white balance with manual preset, this camera will let you take

charge of the scene completely in manual mode. There is also a 3x optical zoom coupled with a 4x digital zoom. Because of its high density CCD, the camera can store images at a native resolution of 2048x1536



**Nikon CoolPix 885**

pixels at 72 dpi in JPEG and TIFF formats. This makes the camera highly suitable for working with print applications where you need to work with higher print resolutions and not lose out on any details.

Another very interesting feature is the Auto scene mode where you can choose from 12 different types of scene settings such as Landscape, Sunset, Fireworks, Portrait, Party/Indoor, etc where the camera will adjust the parameters on its own. You can also attach additional Nikon converter lenses such as a telephoto or a fisheye lens to this camera—a definite advantage for a professional. The USB interface lets you quickly transfer images to your computer and this is implemented via a one-touch button on the camera. This camera would find a wide fan-following among amateurs and professionals alike. The only real hindrance here is its significantly higher price.

**Price:** Rs 31,250

**Contact:** Antrix Tech Zone

**Phone:** 022-8061531

**Fax:** 022-8061531

**E-mail:** antrix@vsnl.net

### Olympus Camedia C-3020

The Olympus Camedia C-3020 is a 3.3 megapixel camera that features a lot of control options for imaging along with the capability of being used as a

straightforward point-and-shoot camera. This camera features a 3x optical zoom with a 2x digital zoom and is capable of storing images at a maximum resolution of 2048x1536 in JPEG as well as TIFF formats. It also features the mandatory parameters such as flash modes (Auto, Red-Eye, Fill, Slow Shutter and Off), Multi-pattern and spot metering and white balance settings with manual calibration. The camera features a very interesting setting, called 'My mode', where you can specify a host of



**Olympus Camedia C-3020**

settings and later simply recall those settings by invoking this mode—ideal if you're shooting many photos in a particular area where lighting and

subject characteristics stay the same. You can also apply effects such as sepia, negative and black and white to the image from the camera itself. The Camedia Master software bundled with the camera has an interesting mode that allows you to 'stitch' up to 10 frames together for a panorama view. The camera uses Smart Media and comes bundled with a 16 MB card while four AA batteries handle its power supply. This camera includes plenty of options that make it suitable for amateur photographers as well as the discerning professional.

**Price:** Rs 35,000

**Contact:** Komal International

**Phone:** 022-2614015

**Fax:** 022-2610219

**E-mail:** indiaolympus@vsnl.com

## Conclusion

Not too long ago, there was really not much that could prompt most people to invest in a digital camera—the prices were exorbitant and the image quality was not good enough. Things are different today. Though still priced on the higher side, there has been a quantum leap in the performance of digital cameras in terms of performance and image quality. This was clearly evident in this comparison.

In the sub-2.0 megapixel category, the camera that really stood out was the

**Kodak EasyShare DX3215.** It showed good performance in the imaging tests where it picked up the fine details and accurate colour. It won our Best Performance Award. The DX3215 could store images at a resolution of 1280x960, which is suitable for viewing large images on a monitor, but you will not be able to print a big picture. This was also the only camera in its category that supported video-out. The easy menu systems, the docking station and point-and-shoot functionality make this camera a good choice for those who do not want to be

bothered with the nitty-gritty of taking photos but want a camera that gets the job done.

The camera that won our Best Value Award was the **D-Link DSC-350** due to its ultra low price. In terms of sheer performance, this camera falls way below the others in its category since it is based on a significantly lower density 350K pixel CCD. There are also no controls for white balance and metering modes and there are just three flash modes. However, if you are simply looking for a very basic imaging device that you can use to take

## Decision Maker

	Getting into digital photography		Semi-professional applications	
You need	Moderate CCD densities, digital zoom, added functionality like Web cam and video recording		High resolution support, high-density CCD, optical zoom, user-selectable features	
Look for	Resolution support of at least 1280x1024, up to 1.3 megapixels, Web cam support and ability to record AVI or MOV clips, 8 MB memory		Resolution support of at least 1600x1200, a 2.1 megapixel CCD, at least 2x optical zoom, the ability to choose metering, flash and white balance modes, 16 MB memory	
	Price-conscious	Performance	Price-conscious	Performance
The models	Fuji FinePix A101, Kodak EasyShare DX3215	Casio GV-10, Kodak EasyShare DX3215, Fuji FinePix A101	Olympus Camedia C-2, Nikon CoolPix 800, Fuji FinePix A201	Olympus Camedia C-2100 Ultra Zoom, Nikon CoolPix 775, Kodak EasyShare DX3600
Price range	Rs 16,000 to Rs 17,000	Rs 16,000 to Rs 27,000	Rs 18,000 to Rs 20,000	Rs 23,000 to Rs 46,000

photos and also double up as a Web cam, this one does the job. This camera integrates 8 MB of memory, is capable of recording AVI clips and with a very small form factor, is a snap to carry around.

The camera that bagged the Best Performance Award was the formidable **Olympus Camedia C-2100 Ultra Zoom**. With its amazing 10x optical zoom and 27x digital zoom, there was no other camera that even came close to this one. This camera exhibited its pure imaging muscle power with brilliant reproduction of the test scene in terms of resolution, details and colour. Based on a 2.11 megapixel CCD, this camera boasts of a host of options that can let



D-Link DSC-350

the user change settings ranging from metering modes to flash and white balance. At its native resolution support of 1600x1200, it is suitable for applications where you would want to print post-

card sized photos at 300 dpi. Especially impressive is the low shutter speed of 16 seconds.

The camera that won the award for Best Value was the **Olympus Camedia C-2**. Sporting a 1600x1200 resolution and a 2.14 megapixel CCD, this camera also had configuration options ranging from five white balance modes to multiple flash and metering modes. This camera did very well in our image tests. Best of all, it was priced very well, bordering on the realm of the sub-2.0 megapixel cameras.



Olympus Camedia C-2100 Ultra Zoom

Gauging by the progress of digital cameras, there is certainly a lot happening. With higher density CCDs, more advanced and longer-lasting battery subsystems, greater functionality, smaller form factors and lower prices, they are going to gain increased acceptance amongst not just professionals, but amateurs as well. While there's a long way to go before digital cameras completely replace conventional cameras, if you're considering buying a digital camera, now is as good a time as ever. Take your pick—there's something for everyone.

DIGIT TEST CENTRE



### Buying? Look out for...

When shopping for a digital camera, many of us go by hype and specifications alone, but there are many other parameters and questions that need to be answered.

**Resolution:** Resolution is everything. It determines whether the camera is suitable for applications such as Web imaging or print applications (see box, 'How much Resolution is Enough?'). Look for a camera that can record images at a resolution of at least 1280x1024 at 72 dpi. The native 72 dpi at which cameras store the images is sufficient for publishing images on the Internet, but at this resolution, you can print only 5.3x4 inch photos at 300 dpi. If you want to print larger photographs at 300 dpi or more, you need a higher resolution.

**Optics:** Look for cameras that have an optical zoom; it is much higher in quality compared to digital zoom, since the lat-

ter is just a method of enlarging the image the camera sees through software manipulation and the camera's DSP (Digital Signal Processor). Digitally zoomed images often appear pixellated when printed at larger sizes.

**Battery:** Digital cameras are known for draining batteries very quickly! Go for cameras that bundle Ni-MH or Li-Ion batteries. These will last you much longer than those that use the conventional AA or AAA alkaline batteries.

**Memory:** The amount of memory that the camera bundles will decide how many photos you can store at a time. Most cameras come with 8 MB or 16 MB of Flash memory that can hold about eight or 16 images respectively at 1600x1200 in the high quality modes. If you have ready access to a laptop or a computer, you can make do with 8 MB, otherwise buy a camera with as much memory as you can afford.



# Who will rule the Web?



ILLUSTRATION: Mahesh Benkar

Web authoring has evolved from designing simple pages to integrating complex technologies. We test two products that boast of being a developer's best companion

Over the past two years, Macromedia has dominated the Web site authoring market with Dreamweaver being the default application of choice for most Web site designers. Even though there are scores of Web authoring tools for enthusiasts and professionals alike, none of them really measure up against Macromedia's baby. With a plethora of features, support for the latest Web standards, a large user base and solid integration of support tools, Dreamweaver has been the undisputed king of the Web, and with its latest version, Dreamweaver MX, it intends to stay on top.

Adobe GoLive has consistently improved with each version and has matured from a program with strong promise to a potential front-runner. Now, with the introduction of GoLive 6.0, Adobe hopes to finally make a significant dent in Macromedia's dominance.

We put Macromedia Dreamweaver MX and Adobe GoLive 6.0 under the microscope to verify their claims to the top spot. We evaluated these software based on the features offered, their user interface, ease of use, technologies supported, HTML editing capabilities and integration with other tools and technologies. All tests were carried out on a system with a Pentium III 1.2 GHz Tualatin processor, 256 MB

RAM and a 20 GB hard disk, running Windows 98 SE.

## User interface

The interface of any development or design tool needs to be as intuitive as possible while being functional at the same time. The interface should grow on you and finding tools should come naturally. Initially most software seem pretty useable, but over a period of time those unnecessary clicks start taking a toll on your productivity and become irritatingly glaring. The interface should allow for a great deal of customisability that lets you create and place the tools you need most in and around your work area. This

allows for clean and uncluttered working environments that let you unleash the full power of your creativity.

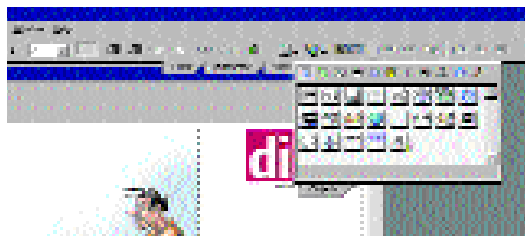
The interface of Dreamweaver MX is simply wonderful. The addition of fully dockable panels and tabbed documents adds a new dimension of customisability. Many parts of the Dreamweaver MX interface can be adjusted and reorganised, and you can even rename items. The collapsible panels can be grouped the way you want and the toolbar too is highly customisable.

Adobe GoLive finds itself dwarfed against the number of options that Dreamweaver MX offers and only allows a certain degree of customisability. To be fair to GoLive, you do have the option of docking individual palettes as single menu items. What is surprisingly missing from GoLive is the typical Adobe interface system. The commonality of the interface amongst Adobe products is very useful and makes working easy when you shift from one program to the other but the GoLive interface is radically different, though it is similar to the earlier GoLive interfaces. The only common feature that we found was the custom workspace profiler that allows you to save different interface layouts for specific users.



Dreamweaver MX has arguably the best interface we've seen in a Web authoring tool

Also, even though GoLive 6.0 does have more palettes than Dreamweaver MX, which offer more contextual settings, you are often left searching for that specific tool you need. We even tried using a few standard shortcut keys with both these software but certain expected shortcuts were missing from Adobe GoLive.



GoLive 6.0 allows you to dock individual palettes as single menu items

The Macromedia team has got it just right; the interface is flexible and can be customised to suit even the fussiest user—you can even go back to the look and feel of Dreamweaver 4.0's interface! This only shows that Macromedia is completely tuned in to the interface requirements of Web designers, but Adobe GoLive has a lot of catching up to do. The purity and simplicity of an interface is almost independent from the core functionality of a product and this is where GoLive could've really upstaged Macromedia, but it fails to do so.

## Ease of use

A quick-start to site development with the help of site-building wizards, templates, sample code and code libraries is always welcome. Tools enabling faster execution and shorter project cycles were our primary criteria here.

The first thing that will catch your eye is the all-new File Explorer in Macromedia Dreamweaver MX. It enables quick browsing for assets and files on the desktop and network volumes, without the need to launch your Operating System's file explorer.



The introduction of Code Hints in Dreamweaver MX considerably speeds up writing code

er. Most professionals would appreciate this feature as they can manage their files without having to switch windows. Surprisingly, Adobe has included this feature in Photoshop but not in GoLive 6.0.

To make things simpler, Dreamweaver MX allows you to select HTML elements straight from the status bar (this feature existed in all previous versions of Dreamweaver). However while using GoLive you will have to wade through the menus to locate this feature.

Another all-new addition in Dreamweaver MX is the Snippets Panel, which stores pieces of code for later reuse. Dreamweaver also contains quite a few predefined snippets that you can use. This can instantaneously solve complicated design problems and you can save layouts or functions for future projects. You can create and insert snippets of HTML, JavaScript, CFML, ASP, JSP, and more.

Dreamweaver MX also comes with robust code editing support that makes every coder's life a little easy. Code Hints let you code as you type. When you are in code view, the software automatically provides relevant code for you to select the appropriate tag attributes, methods properties, functions, parameters and Cascading Style Sheet (CSS) styles. This tremendously speeds up and eases coding. Moreover, you can also add your own tags to the library. GoLive, on the other hand, has only a minimal library of sample JavaScript functions.

Smart Objects allows designers to quickly and easily integrate Photoshop, Illustrator, and Flash assets with drag and drop simplicity within GoLive itself. Both Dreamweaver MX and GoLive 6.0 feature helpful site setup wizards and sport a template architecture, but Dreamweaver allows you to define editable, optional and repeating regions for these templates.

With its superior interface, nifty additions like the Snippets Panel and Code Hints, loads of sample code and templates, Dreamweaver MX provides you with all the tools you need to become more productive.

## Server-side support

Advanced Web development makes use of server-side scripting languages to build dynamic Web applications. Such functionality is directly built into

Dreamweaver MX and it supports a bunch of server-side code libraries like ColdFusion, ASP, ASP.NET, JSP and PHP. GoLive supports ASP, JSP and PHP, but its PHP support was far more robust than that in Dreamweaver MX.

Dreamweaver MX has native support for editing XHTML documents as well as XML files with arbitrary DTDs (document type definitions). In GoLive 6.0 there's support for a variety of form submission behaviours for ASP, JSP, and PHP databases, including dynamic creation of popup menus, lists, and radio buttons, and the facility to update, delete and add records. Dreamweaver MX features an integrated database panel, and you can drag database objects directly onto a page, whereas in GoLive, you will have to create an object and then bind it to the database element.

Both software had good debugging capabilities wherein they let you check for invalid bindings and examine server-side code for errors. The site reporting capabilities of GoLive are better than Dreamweaver's and it can generate a whole bunch of additional details such as listing out large files that might slow down a page, images with missing attributes, usage of fonts and colours, listing of external links, etc.



GoLive 6.0 offers detailed site reporting capabilities

As an advanced Web development tool there is little that Dreamweaver MX lacks. GoLive, on the other hand, has support for all the major technologies but the implementation is still lacking in some areas.

## Integration with other tools and technologies

Web sites today are made up of various elements from different applications and integration with other tools is becoming increasingly important as it's cumbersome to switch between programs in order to generate and access specialised media assets.

With Dreamweaver MX you can



Features at a Glance		
	Adobe GoLive 6.0	Macromedia Dreamweaver MX
User interface	Different from other Adobe products; you might take some time to adjust to it	High customisability with new panel management features and faster access to important features
Ease of use	Smart Objects makes integration and working with media assets quicker	Nifty additions like the Snippets Panel and Code Hints make working much easier
Help/documentation	Decent set of help files is provided but Adobe should have added context-sensitive help	An elaborate and well-indexed set of help files provides relevant information at the click of a mouse
Server-side support	ASP, JSP, PHP and SMIL	ColdFusion, ASP, ASP.NET, JSP and PHP
Support functions & compatibility	Well-integrated support functions	Streamlined, unobtrusive and robust support functions
Integration with other tools	Supports most Adobe design products, Macromedia Flash, Apple QuickTime	Supports Macromedia products
Basic HTML handling	Creation of Web pages is easy, but error-prone*	Creates Web pages quickly, with clean code and without errors
Memory consumption	72 MB	31 MB
Start-up time	38 seconds	17.5 seconds
Price	\$399 (Approx Rs 20,000)	\$399 (Approx Rs 20,000)
Contacts	Adobe Systems Pvt Ltd, Phone: 0128-4532026/0128-4532010, E-mail: sandeepm@adobe.com	Wipro Infotech Enterprise Software Group, Phone: 080-8440011/0187, E-mail: surajs@wipro.co.in
Overall rating	<b>B</b>	<b>A</b>

\* A Web page consisting of text, images, tables and rollover effects was created using both software. Once the page was created, we saved the document on the desktop and opened it using Internet Explorer 6.0. The page created in Dreamweaver opened up directly, however, the page created in GoLive did not show any images. There was a problem as GoLive used relative links from where it expected the file to be saved— GoLive's working folder, instead of the desktop.

directly launch and edit Macromedia Flash files and also edit ActionScript. With support for Macromedia Fireworks you can now edit and optimise image assets directly. GoLive works seamlessly with Adobe applications like Photoshop, LiveMotion, and Illustrator along with other applications like Apple QuickTime and Macromedia Flash (GoLive even has a huge set of sample ActionScript). Files saved in Illustrator and Photoshop can be directly edited in GoLive. For example, a sliced PSD source file can be freely resized within GoLive 6.0 without having to leave the application.

Unlike Dreamweaver MX, Adobe GoLive also has an SMIL editor (Synchronized Multimedia Integration Language, which is used to create animations that run directly within your HTML page without the need of a plug-in) with an authoring preview module that allows visual layout and control of an SMIL timeline and embedded assets.

Today you would expect products from the same company to have a certain level of integration and cross functionality. Dreamweaver does support all Macromedia products, but GoLive 6.0 comes up trump here purely because it includes support for third party tools such as Macromedia Flash and Apple QuickTime.

Support functions and compatibility

An HTML editor must be supplemented with powerful CSS handling capability, integrated spell checking, syntax checking and also an extensive tag library. These make authoring tasks a lot easier as the developer can concentrate on building Web sites rather than checking for errors. The spell checking capability of both software is equally good. Dreamweaver MX and Adobe GoLive both feature a powerful 'find and replace' function wherein you can locate text, source code and specific tags in a particular file, folder or an entire site. The formatting capabilities of Dreamweaver MX and GoLive are also at par. We did not encounter any compatibility issues with either Dreamweaver or GoLive while creating pages for older Web browsers. All in all there's very little to choose between Dreamweaver and GoLive when it comes to support tools and compatibility issues.

Help and documentation

Dreamweaver MX has a huge set of help files, which explain each and every feature in utmost detail. More importantly, it's very well indexed so you can easily find information on a particular task. There's also the new 'Answers' panel, which gives you one-click access to tutorials and online help. Clicking on the 'update' button will automatically download the latest help and

troubleshooting content! Adobe GoLive has a decent set of help files, however, it is not context sensitive or as detailed as the help in Dreamweaver.

And the winner is...

Adobe has infused some noticeable improvements in GoLive 6.0 and engineered a much better product than its previous versions. Its HTML editing tools and solid integration with other design applications makes GoLive pretty accessible and powerful enough to build even the most complex sites. However, in comparison with Dreamweaver MX it is still some way behind. Dreamweaver offers Web authors an excellent and highly customisable interface that makes coding and designing more easy, support for the latest scripting languages and extensive help that provides you with the latest information all the time. With the price of both products being identical there's little doubt as to why Macromedia Dreamweaver MX retains its title as the most powerful Web design tool in the market.



Dreamweaver MX: Robust features and smart integration

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

## LG DAD-8020B DVD-RAM drive

## Burn your hard drive



This DVD-RAM drive can record up to 4.7 GB of data per side on a DVD-RAM disc and is capable of reading DVD-RAM, DVD-ROM, DVD-R, CD-RW and CD-ROM discs. The DVD-RAM format is a DVD consortium approved format; this means it has been tested for compatibility with existing formats and therefore can be used with all existing DVD-ROM drives.

The current specification (version 2.1) is for 4.7 GB or 9.4 GB (double sided) capacity media (12 cm) which offers over 100,000 recording cycles and, in theory, a life span of 30 years or more.

The drive comes with a 2 MB buffer, which is more or less standard with most drives nowadays. The build quality is excellent. A single DVD-RAM disc encased inside a protective shell was provided with the drive.

The DAD-8020B comes with a caddy type loading mechanism and the DVD-

RAM disc needs to be inside the caddy while you copy data on or from it. Bundled along with the drive is InstantWrite 2.5, which is a DVD-RAM UDF file system writing software.

The drive was detected instantaneously by Windows XP and it required no drivers. We tested the drive with the provided disc and the burn process took about 30 minutes to write a total of 4.68 GB onto the disc.

**Price:** Rs 35,000  
**Contact:** LG Electronics India Ltd  
**Phone:** 0120-4560900/940  
**E-mail:** mani@lgezbuy.com  
**Fax:** 0120-45679

## SPECIFICATIONS

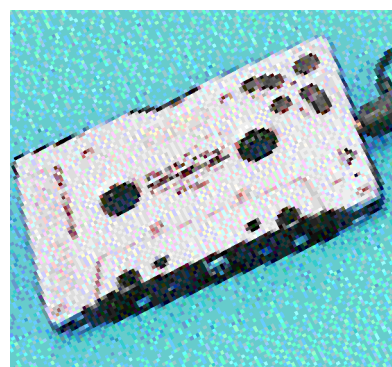
Package includes InstantWrite 2.5 (authoring tool); Power VCR 3.0 (MPEG-2 software); one DVD-RAM disc in cartridge

LG DAD-8020B		A
Build quality	★★★★★	
Ease of use	★★★★★	
Value for money	★★★★★	
Features	★★★★★	
<b>OVERALL</b>	★★★★★	

## M-any DAH200 MP3 player

### A versatile player

Here's a personal music player that you can carry around in your pocket and also attach to your car deck or to a normal cassette player. The new M-any DAH200 has the same form factor as an



audiocassette and has all the controls for play, forward, stop and rewind.

It comes with a recharge-

able Ni-MH (Nickel Metal Hydride) battery and a charger, and gives up to six hours of playtime. The player has 64 MB memory and also includes a powerful microphone that allows you to record sounds

for up to 2 hours. If you find 64 MB too less, it has an MMC slot which supports most of the commonly available Flash cards.

If you have trouble using the player in the cassette deck, the Head Control option located at the centre of the player can be used to move the head right or left to obtain proper alignment with your player.

The DAH200 has a completely metal body, and is one of the tougher MP3



**Kabir Malkani**  
Manager Design,  
Multimedia

**The M-any DAH200 is perfect for any car owner who has an audio player that lacks an audio out**



players that we've seen. File types supported are MP3 and WMA. Connecting the player to a PC for downloading music is very simple—plug it in using the USB connector that's provided and then use the bundled M-any Loader 3.4 software to drag and drop songs into the device. Please note that the device needs to be connected before the PC is switched on, otherwise a 'No device found' message is flashed.

**Price:** Rs 6,999  
**Contact:** Moon Computer Manufacturing Industry  
**Phone:** 022-2653390  
**Fax:** 022-2651369  
**E-mail:** sales@moonindia.com  
**Web site:** www.moonindia.com

One thing that is conspicuous by its absence is the LCD display indicator, making it impossible to see the track's ID3 information. This player is best suited for those of you who want to port their MP3 tracks to their cassette players and for those who need to record minutes of their meetings on the fly.

#### SPECIFICATIONS

64 MB, weighs 70 grams, one MMC slot, USB interface, Ni-MH rechargeable battery

M-any DAH200		B+
Performance	▶ ▶ ▶ ▶ ▶	
Build quality	▶ ▶ ▶ ▶ ▶	
Value for money	▶ ▶ ▶ ▶ ▶	
Features	▶ ▶ ▶ ▶ ▶	
<b>OVERALL</b>	▶ ▶ ▶ ▶ ▶	

## Creative Sound Blaster Extigy

World of audio

It might be difficult to find another device packed with the features and sophistication of Extigy. It plugs into



the USB port of the PC and takes over the sound functions; you don't need to install an internal soundcard. If you already have one, the Extigy will simply override it. The Extigy has all major controls upfront for easy access. It can also work without the PC

and can take input from a DVD player, MD player, portable MP3 player and even gaming consoles such as the PlayStation2 and Xbox. It can also create 'pseudo' surround modes from two-channel stereo music or games for use with 5.1, four and even two-speaker setups.

The software bundled with the Extigy has applications to organise music playlists for playback and recording, as well as for audio processing such as cleaning up clicks and pops and adding reverb. However, the Extigy does not have an in-built amplifier and must be used with amplified speakers like Creative's own Inspire 5300 and 5700, or with an external power amplifier.

#### SPECIFICATIONS

5.1 channel support, Dolby Digital compliant

Creative Sound Blaster Extigy		A-
Performance	▶ ▶ ▶ ▶ ▶	
Ease of use	▶ ▶ ▶ ▶ ▶	
Value for money	▶ ▶ ▶ ▶ ▶	
Features	▶ ▶ ▶ ▶ ▶	
<b>OVERALL</b>	▶ ▶ ▶ ▶ ▶	

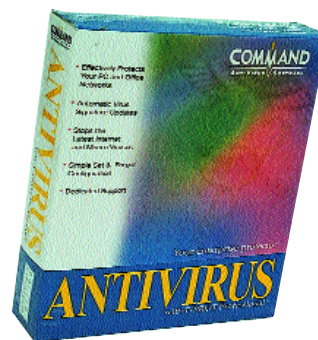
**Price:** Rs 13,650  
**Contact:** Compuage Infocom  
**Phone:** 022-8305500  
**E-mail:** info@compuageindia.com  
**Web site:** www.compuageindia.com

## Command Antivirus

Your PC's guard

Here's a no frills anti-virus software, which is light on your system and is yet an extremely fast and effective virus scanner. It has a strong F-PROT-based engine capable of detecting viruses and curing, renaming, quarantining or deleting files in real time or through on-demand scanning. If you are a network administrator you will definitely appreciate its ability to send custom messages via e-mail, containing a short warning or the full scan report. This can be helpful if you manage virus protection on a range of machines.

On the whole, this is an anti-virus software with good



detection rates and is backed by an excellent technical support team, ensuring that your system remains virus free.

#### SPECIFICATIONS

Windows 95/98/Me/2000/XP, 5 MB install size

Command Antivirus		B
Performance	▶ ▶ ▶ ▶ ▶	
Ease of use	▶ ▶ ▶ ▶ ▶	
Value for money	▶ ▶ ▶ ▶ ▶	
Features	▶ ▶ ▶ ▶ ▶	
<b>OVERALL</b>	▶ ▶ ▶ ▶ ▶	

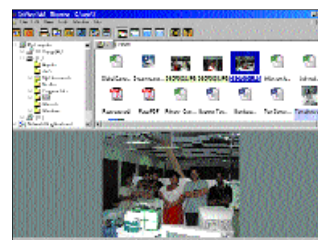
**Price:** Rs 1,500  
**Contact:** Command Software Systems  
**Phone:** 022-5006650  
**Fax:** 022-5006651  
**E-mail:** info@commandindia.com

## Xnview

App with a view

Xnview is an image viewer and a multimedia player that supports more than 340 file formats, including PNG, JPEG, Targa, TIFF, GIF, BMP, animated GIF, multipage TIFF, MPEG, AVI, WAV, AIFF and QuickTime files. All files are displayed as thumbnails in its Explorer-like viewer; to get a full view, simply point the cursor on the image. It also creates slideshows and all files can be converted into any selected file format through a batch conversion process. This feature is quite handy if you need to convert images in different formats to a single format for prepress printing or processing. You can also use this application to create contact sheets—this makes it easier to glance

through a set of thumbnails as they are on a single sheet. Xnview supports OSes ranging from the legacy DOS and Windows 3.x to Windows XP, Linux, AIX and Sun Solaris.



One interesting feature is that you can change the language used, on the fly, which changes the menu commands. But be careful, a mistake here could make the application completely unusable. To undo this, we had to

uninstall and reinstall the application. When you are browsing through the folder for images, the application first scans the entire folder. If you have a lot of images on your PC, this process can take up quite some time.

Xnview takes up 10 MB of space on your PC, but with

**Price:** Freeware  
**Web site:** [www.xnview.com](http://www.xnview.com)

the kind of file support it offers, it is worth it.

#### SPECIFICATIONS

2.4 MB download file, takes up 10 MB disk space, Windows 9X/2000/XP

Xnview		B+
Performance	▶▶▶▶▶▶▶▶▶▶	
Ease of use	▶▶▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶▶▶	
Features	▶▶▶▶▶▶▶▶▶▶	
<b>OVERALL</b>	▶▶▶▶▶▶▶▶▶▶	

## Logitech optical mouse

Easy on the hands

This USB mouse is lightweight, good looking and easy to install. The package also provides a USB to PS/2 adapter, which can be handy if your PC does not have a USB interface. Apart from this, the package includes the MouseWare CD supporting almost all the operating systems available today (Windows 95/98 SE/2000/XP and various versions of Linux) along with a user manual that explains how to use the mouse without straining your hand. Using the software provided on the CD, you can change mouse pointers,



speed, refresh rate, etc for the device. The wire that connects the mouse is long enough and the device itself feels comfortable to use. Since it's an optical mouse, you can use it on any surface. The roller button however feels a bit tacky.

#### SPECIFICATIONS

USB interface 1.1

Logitech optical mouse		B
Performance	▶▶▶▶▶▶▶▶▶▶	
Build quality	▶▶▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶▶▶	
Features	▶▶▶▶▶▶▶▶▶▶	
<b>OVERALL</b>	▶▶▶▶▶▶▶▶▶▶	

**Price:** Rs 1,200  
**Contact:** Rashi Peripherals  
**Phone:** 022-8260256  
**Fax:** 022-8221012  
**E-mail:** [ho@rptechindia.com](mailto:ho@rptechindia.com)  
**Web site:** [www.rptechindia.com](http://www.rptechindia.com)

## Olivetti OFX580

M for multifunctional

The Olivetti OFX580 is targeted at SoHo users who would like to have a one-stop solution for their basic day-to-day office chores. The device is a printer, scanner, fax machine, copier and a telephone, all rolled into one. It occupies very little space on your desktop and sports good looks too. The buttons are well placed and



colour-coded. The telephone supports caller identification and hands-free dialling. The package includes the Linkfax software, using which you can scan and mail files directly from the application. There's an LCD panel on the front of the device, which is handy if you want to check the status of the device—whether it's printing, faxing or copying.

Going by our tests, the quality of the black and white prints is quite good and so is the performance of the scanner and copier, but the colour printouts are of average qual-

**Price:** Rs 19,100  
**Contact:** Spice Net Limited  
**Phone:** 022-6122419/6132165  
**Fax:** 022-6122419  
**E-mail:** [ro\\_mum@spicenetindia.com](mailto:ro_mum@spicenetindia.com)

## Nishubuki Desknote A900

Desktop power with notebook mobility

Unlike other notebooks, Nishubuki Desknote A900 packs enough power to be considered as a desktop replacement. Sporting a 1 GHz Pentium III mobile processor and 192 MB RAM, it ensures sufficient power for most office applications.

But when running several applications simultaneously, the performance was sluggish, as seen in the two main tests that we ran, namely, Content Creation and Business Winstone. Here it generated scores of 13.5 and 14.1 respectively, which was less than what we expected (the average score for PCs with similar specifications is around 20 points in both tests).

Communications is taken care of by a V.90 56 Kbps modem and a 10/100 Mbps LAN adapter. For users seeking to attach external devices, the Desknote has four USB ports. The TV-out function

ity. Hence, if you need to print heavy graphics, this device is not a good option. Barring Windows 95 and 98, it does not support any other operating systems, which narrows down its usability.

#### SPECIFICATIONS

Printing: 300 dpi in black and white, 600 dpi in colour, 2.6 ppm in black and white and 1 ppm in colour  
Scanning: black and white scanning at 200x200 dpi with 64-bit grey scale mode  
Faxing: 7 seconds to scan at 14,400 bps  
Copying: 2 copies per minute; maximum 140 per cent zoom

Olivetti OFX580		B
Performance	▶▶▶▶▶▶▶▶▶▶	
Build quality	▶▶▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶▶▶	
Features	▶▶▶▶▶▶▶▶▶▶	
<b>OVERALL</b>	▶▶▶▶▶▶▶▶▶▶	



lets you make business presentations or watch movies on a larger screen. The display system comprises a 14.1-inch XGA TFT screen supporting a maximum resolution of 1024x768 with a built-in SiS 64 MB (shared memory) 3D graphics card.

The external Ni-MH battery is a novel concept and helps reduce the weight of the Desknote. However, the external battery drained out in 33 minutes in the Battery-Mark 4.01 test.

All in all, the Desknote is



a good buy for users needing good computing power while on the move.

**Price:** Rs 49,900

**Contact:** Nishubuki Computer Systems

**Phone:** 022-5825965

**Fax:** 022-5379719

**E-mail:** nishubuki@vsnl.com

#### SPECIFICATIONS

1 GHz Pentium III mobile processor, 192 MB RAM, 10 GB IBM hard disk drive, SiS 64 MB (shared) graphics card, 24x CD-ROM, four USB, one parallel, one COM and one infrared port

**Benchmarks:** 14.1 in Business Winstone 2001, 33 minutes in

BatteryMark 4.01, 13.5 in Content Creation 2001

**SiSoft benchmarks:** 111/113 MBps Memory ALU/FPU; 5 MBps in hard disk sequential read, 2.5 MBps in random read, 5 MBps in sequential write, 3.8 MBps in random write, average access time of 12 ms

Performance in *Quake III Arena*: sluggish and jerky but playable at 640x480

#### Nishubuki Desknote

Performance	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
<b>OVERALL</b>	▶▶▶▶▶

B

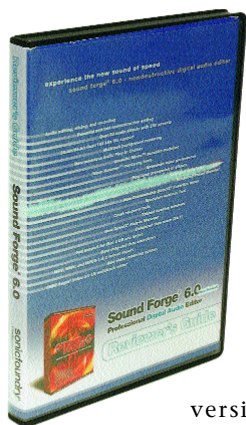
## Sound Forge 6.0

### Forging ahead

With this new release of Sound Forge, you can edit audio files onto the sample file with high speed and accuracy, without damaging the source file. The multitask background rendering feature also makes things faster as you can now work on one file while another is being rendered in the background.

Sound Forge 6.0 supports files larger than 4 GB and also includes the ability to record 32-bit files (192 KHz file support), ensuring pristine audio quality. Sound Forge 6.0 lets you open and edit MOV, WMA, WMV, MPEG1 and MPEG2 files, which means you can also edit video. Version 6.0 lets you burn CDs, so you don't need a separate software for this. Free Vegas Video 3.0 LE, a software bundled along with Sound Forge, allows you to mix audio and video using multiple tracks. It performs fast edits and applies effects and transitions. You can even hear and see the results in real-time.

The present interface is similar to the previous



version.

Professionals in the field of sound editing will find the new version worth upgrading to—it has a long list of new features and also lets you apply filter effects and edit sound a lot faster than you could ever before.

#### SPECIFICATIONS

200 MHz CPU, Windows-compatible soundcard, CD-ROM drive, supported CD-Recordable drive (only for burning CDs), 24-bit colour display recommended, 32 MB RAM, 25 MB hard disk space for program installation, Windows 98 SE/Me/2000/XP, Microsoft DirectX 8 or later

#### Sound Forge 6.0

Performance	▶▶▶▶▶
Ease of use	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
<b>OVERALL</b>	▶▶▶▶▶

A-

**Price:** Rs 16,600

**Contact:** Pro-Music Inc

**Phone:** 044-8261445

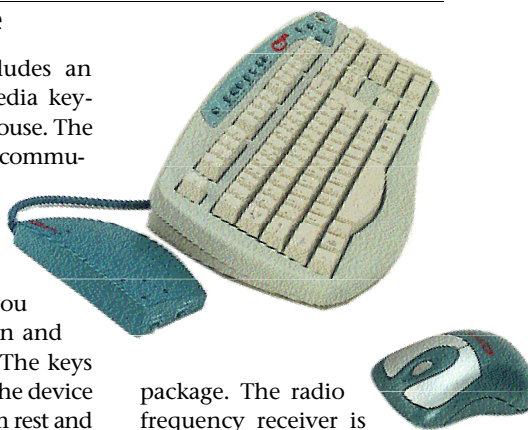
**Fax:** 044-8213607

**E-mail:** promusic@vsnl.com

## Typhoon wireless desktop

### A neat package

This package includes an Internet multimedia keyboard and a wheel mouse. The mouse and keyboard communicate with the PC using radio frequency through the provided receiver. The keyboard gives you good tactile sensation and is very comfortable. The keys are well laid out but the device doesn't include a palm rest and this could disappoint some users. There are 12 hotkeys on the keyboard aimed at speeding up your tasks. The keyboard is powered by two AA batteries, which are provided with the package. The Wheel 3D mouse also works on digital radio technology and features a noiseless scroll wheel. Its design is symmetrical, so both left and right-handed users should feel comfortable using it. The mouse is powered by two AAA batteries, which are also provided with the



package. The radio frequency receiver is easy to install—all you have to do is select the appropriate channel for the mouse and the keyboard and it's ready to be used. You can use the keyboard and mouse up to a distance of 10 feet—in our tests, the connection was lost when the distance was more.

#### PACKAGE CONTENTS

Mouse, keyboard, RF receiver, manual and the wireless desktop software

#### Typhoon wireless desktop

Performance	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶
Features	▶▶▶▶▶
<b>OVERALL</b>	▶▶▶▶▶

B

## Umax Astra Slim 600

### A sleek scanner

Here's another scanner from the Umax stables. It comes in a blue-grey colour combination and has a USB interface, and a height of just over an inch. It can be powered directly from the USB interface without an external adapter. It can be completely managed through the bundled software by means of just a single button on the panel.

In our tests, it managed to preview a page in 26.94 seconds. But it took very long (119 seconds) to scan a full-page colour photograph at 300 dpi. In the image quality eval-



uation test, the results were quite stunning as the scanner scored 21 points out of a maximum of 29. The colour reproduction was pretty good too—the scanner picked up almost all the shades quite well.

However it was poor at picking up details. In the resolution test where five blocks of

lines of varying thickness are scanned, it only managed to scan the blocks as just one single box, failing to reproduce the fine lines therein.

This scanner comes with a host of bundled applications including Scan Manager, Photo Express SE 3.0 and Readiris 5.0 OCR software,

**Price:** Rs 4,950

**Contact:** Neoteric Informatique

**Phone:** 022-4172600

**Fax:** 022-4185294

**E-mail:** sales@neoteric-info.com

**Web site:** www.neoteric-info.com

making it one of the better package deals. With a price tag under Rs 5,000 and its ability to scan at 1200 dpi, it is a good buy for the home and the SoHo segment.

#### SPECIFICATIONS

48-bit scanner, USB interface, no external power required

Umax Astra Slim 600 <span style="background-color: red; color: white; border-radius: 50%; padding: 2px;">B+</span>	
Performance	▶ ▶ ▶ ▶ ▶
Build quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
<b>OVERALL</b>	▶ ▶ ▶ ▶ ▶

## Saitek Cyborg 3D Gold joystick

### Sheer joy

Cyborg has looks that'll make any gamer drool. The joystick has 12 buttons, all of which can be customised for use with different games. The rubberised rest pad ensures that your hands won't suffer from repeated stress injury (RSI) after those long-drawn dog fights. This pad can even be adjusted for height. The joystick can be moved on its own axis (the Z-axis) and this feature can be configured to control the rudder in flight simulation games. The eight-way hat switch lets you look around in a flight simulation, giving you the advantage of 'situational awareness'.

This joystick, however, is not meant for first person shootouts and racing games, although one can configure it to play them. The package includes Saitek Gaming Extension, a utility that lets



you program the buttons for different gaming needs—it lets you program multiple keystrokes and assign them to a single button for easier execution of combination moves.

You can use Saitek Gaming Extension to create profiles for different games. This profile can be automatically loaded when you start the game, doing away with the bother of setting controller options every time a new game is started.

This joystick is best used for flight simulation (both aircraft and helicopter) games. The price is relatively affordable considering the number of features, the build quality and the sheer looks it offers.

#### SPECIFICATIONS

USB interface, eight fully programmable buttons, eight-way hat switch

Saitek Cyborg 3D Gold <span style="background-color: red; color: white; border-radius: 50%; padding: 2px;">A-</span>	
Build quality	▶ ▶ ▶ ▶ ▶
Ease of use	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
<b>OVERALL</b>	▶ ▶ ▶ ▶ ▶

**Price:** Rs 2,990

**Contact:** Origin Marketing

**Phone:** 022-8801335

**Fax:** 022-8835886

**E-mail:** origin121@vsnl.com

**Web site:** www.origin121.com

## Iomega USB 2.0 portable hard disk

### Small is smart

This 20 GB external portable hard drive weighs 230 grams and has an easy-to-carry form factor. Although the drive is USB 2.0 compliant, it works fine with the older USB 1.1 interface found



on most PCs as well. When tested for data transfer speed, the drive logged a transfer rate of 4 MBps (sequential write) from an IDE drive attached to the system.

The installation is slightly different from the other USB devices available—the driver needs to be installed before the device is plugged in and only then does the installation proceed. The power plug supplied with the device has flat pins and not the usual rounded ones, so you will have to buy a converter for the power cord. The software bundled

with the drive includes Iomega Backup software, Quick Sync software to sync files and backup the data on the portable hard drive, and Music Match Jukebox. With effortless installation, smooth usage and commendable data transfer rates for an external storage device, transferring large files between locations is a snap with this drive.

#### SPECIFICATIONS

20 GB USB 2.0 external drive, base unit weighs 150 grams, docking/power unit weighs 80 grams, includes a USB 2.0 card

Iomega USB 2.0 <span style="background-color: red; color: white; border-radius: 50%; padding: 2px;">A-</span>	
Performance	▶ ▶ ▶ ▶ ▶
Build quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
<b>OVERALL</b>	▶ ▶ ▶ ▶ ▶

**Price:** Rs 12,500

**Contact:** Ingram Micro India Ltd

**Phone:** 022-5550604

**Fax:** 022-5550605

**E-mail:** manish@imindia.com



**Afzal Mazgaonkar**

Video Editor,  
Media Studio

Iomega USB 2.0 has enough space for huge files and USB 2.0 connectivity speeds up the transfer time



# For a few **polygons** more

Agent 001 sets out to satisfy his thirst for graphics cards

Unless you're a Zen master, who has found inner peace and is not perturbed by the insufficiencies of life, chances are you're looking for a new graphics card. Most games released today need a high-end card that lets you enjoy the immersive game environment to its fullest. My own excursion for the card was fuelled by a single-minded motive: I wanted to play *Medal of Honor* at a frame rate that didn't resemble a PowerPoint presentation.

My search for a better graphics card began with a *pan-chewing* dealer in Lamington Road, Mumbai. I was inquiring about the regular GeForces and Radeons, when he tried to sell me his 'best selling item'—an ASUS V3800, 32 MB RIVA TNT2 M64 for a bargain price of Rs 2,750! Now a Riva TNT2 M64 card can only play Real Time Strategy (RTS) games and OpenGL/Direct 3D games that are over two years old. Games like *Quake III*, *Counter-Strike*, *Soldier of Fortune* will play without a hitch on these cards, but for games like *Soldier of Fortune II*, *Medal of Honor* and *Return to Castle Wolfenstein*, you'll need at least an entry level GeForce card to see all those cool effects. Otherwise, you would have to scale down the graphics quality to such an extent that playing the game would just not be the fun it was meant to be.

Touched by my enthusiasm, one kind dealer let me ogle at an


ASUS AGP-V8460 Ultra 128 MB DDR, GeForce4 Ti4600 with TV-out, Video-in and DVI. I felt the textures of the box, and marvelled at the devastating power it held within, but my spirits sank when I heard the price—Rs 34,500! I put it down politely, and looked around for something more affordable. Much to my disappointment, I learnt that most dealers in Lamington Road didn't stock high-end cards such as the GeForce3—these were available only by order.

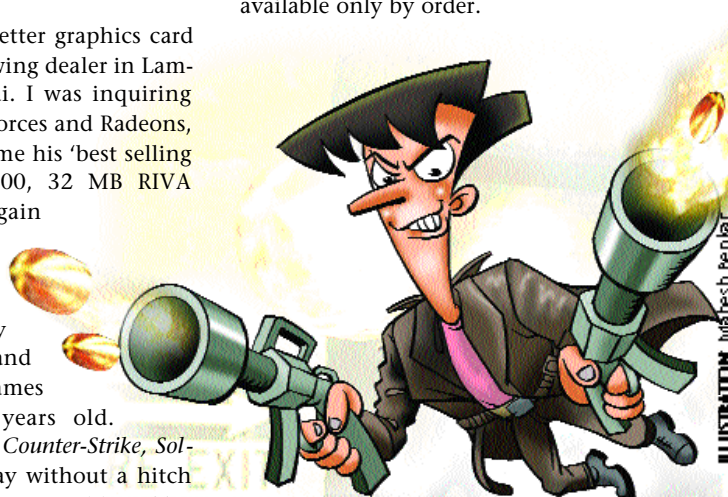
now, since the cards were in demand and would soon be out of stock. But my curiosity got the better of me and as I looked around, I found other cards that looked rather inviting. The ATi Radeon 8500 for Rs 15,500 is a good alternative to the nVidia cards and its performance is comparable to the GeForce3. The lower-end ATi Radeon VE 32 MB was available at a street price of Rs 3,500, while the ATi RAGE 128 was priced at Rs 2,500. As I

scoured longer, I found some more GeForce2 substitutes—the MSI make was available for Rs 4,365, while an MX200 card cost just Rs 2,800.

Graphics cards don't come in just the plain vanilla flavour anymore; there are many different versions available for each graphics chipset, each at varying price points. The GeForce4 chip itself has no less than six flavours (three each in the Ti and MX range). Also, manufacturers add funny sounding names like Ultra, Pure, Deluxe, Pro, VIVO, etc to their cards to highlight additional features like higher memory speeds, TV tuner capability, FM radio, Video-out, VR glasses, etc. Sounds confusing? It is!

Most games today need 32 MB of video RAM, unless you want to play at a resolution of 1024x768 (at 32-bit colour) or higher. The GeForce2 MX is ideal because it's cheap (cheaper than the GeForce DDR cards) and suited to most games available today. It proves to be almost as fast as the GeForce DDR (Double Data Rate) and faster than a GeForce SDR (Single Data Rate memory). This card will also pull you through the year until *DOOM III*'s release makes every card in the market obsolete!

The key to buying the right card is to inquire about the different manufacturers at various dealers. Prices vary between manufacturers because each uses different specifications like core and RAM speeds. My wallet being slightly handicapped, I called it a day by settling for the GeForce2 MX card from HIS, after bargaining off a couple of hundred rupees. 



A trek further down to Andheri in the western suburbs yielded a goldmine. Here, the Pine 64 MB SDRAM GeForce2 MX400 came at the heart-warming price of Rs 3,500 and Maxtone's GeForce2 MX400 cost just Rs 3,000! The cards came unaccompanied by any frills like bundled software and forfeited the cooling fans. The dealer advised me to make my choice



■ Your choice of graphics card will depend heavily upon the kind of games you play. If you are into the latest First Person Shooters (FPS) and 3D gaming, a powerful card like the GeForce2 GTS is necessary. For strategy, adventure and 2D games, a simple RIVA TNT2 would suffice.

■ Choose the card that best suits your processor. If your processor is slower than 700 MHz, then a GeForce2 MX is recommended. But if your system is faster than 900 MHz, you could opt for a GeForce2 Pro with 32 MB of video memory.

■ Check if your motherboard has an AGP slot and supports AGP 4x before buying a GeForce-level card.

■ Buy within your budget, since there are enough flavours for every graphics chipset to suit you and you will probably be tempted to upgrade as soon as a new game comes out.

■ The performance of a graphics card varies from manufacturer to manufacturer, so check performance benchmarks before making your buying decision.

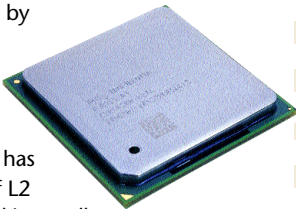
# config.sys

## POWER RIG

COMPONENT	MODEL	PRICE (RS)	CONTACT
Processor	Intel Pentium 4 2.4 GHz	23,340	Nebula
Motherboard	Intel D850EMV2	8,220	Nebula
RAM	512 MB RDRAM	8,000	Micro-D Components
HDD	Seagate Barracuda ATA4 40 GB (7,200 rpm)	5,750	ACI Infocom Ltd
Video Card	ASUS V8420 GeForce4 Ti 4200	19,950	Zeta Technologies
Monitor	Viewsonic G73F (17-inch)	18,750	Roop Electronics
CD-Writer	Plextor 40x	9,950	Zeta Technologies
DVD-ROM	Pioneer 16x	4,250	Zeta Technologies
Soundcard	Creative Sound Blaster Audigy DE	7,600	Compugae Infocom
Speakers	Creative Inspire 5.1 5300	9,750	Compugae Infocom
LAN Card	D-Link 10/100 Mbps	800	Mnemonic Systems
FDD	Generic	700	Mnemonic Systems
Keyboard	Logitech Cordless Freedom	6,000	Rashi Peripherals
Mouse	Logitech Mouseman Dual Optical	4,000	Rashi Peripherals
Steering Wheel	Logitech MOMO Force	7,999	Aditya Infotech
Joystick	Logitech WingMan Strike Force 3D	6,999	Aditya Infotech
Operating System	Windows XP Professional	9,000	Fiona Infosystems Ltd
		<b>1,51,058</b>	

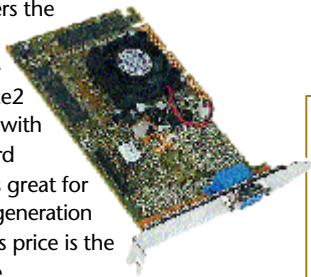
### Intel Pentium 4 2.4 GHz

This latest offering from Intel is built on the 0.13-micron technology and leverages performance by featuring support for 533 MHz bus speeds. It has 512 KB of L2 cache and its small die size reduces power consumption. When coupled with RDRAM, you get the most powerful combination in the market.



### HIS GeForce2 MX400

From all the components that make up the value rig, the HIS GeForce2 MX-400 really stands out. This product offers the best bang for the buck by coupling the GeForce2 MX-400 chipset with 64 MB of onboard RAM. The card is great for playing current generation 3D games and its price is the icing on the cake.



## LEAN MACHINE

COMPONENT	MODEL	PRICE (RS)	CONTACT
Processor	AMD Duron 1GHz	4,000	Great World Tech
Motherboard	Jetway V266B	5,000	Rashi Peripherals
RAM	256 MB SDRAM	2,000	Micro-D Components
HDD	Seagate 40 GB (5,400 rpm)	3,500	ACI Infocom
Video Card	HIS GeForce2 MX400	3,000	Maxtone Electronics
Monitor	Proview PA 566 (15-inch)	4,950	Venptron Digital System
CD-ROM	ASUS 52x	2,400	Rashi Peripherals
Speakers and	Artis S100	1,800	Kunhar Peripherals
Soundcard	Jetway Artis 4.1	650	Bitsy Infotech
FDD	Generic	700	Mnemonic Systems
Keyboard	Samsung SDL1500	400	Mnemonic Systems
Mouse	Logitech scroll mouse	650	Rashi Peripherals
Operating System	Windows Me	6,000	Fiona Infosystems Ltd
		<b>35,050</b>	

ACI Infocom Ltd (022-8266031) ■ Aditya Infotech (022-6338555) ■ Bitsy Infotech (022-8638084) ■ Compugae Infocom (022-8305501) ■ Fiona Infosystems Ltd (022-6959426) ■ Great World Tech (022-3892828) ■ Kunhar Peripherals (022-2345758) ■ Maxtone Electronics (022-3075393) ■ Micro-D Components (080-6785158) ■ Mnemonic Systems (022-8010871) ■ Nebula (022-6730567) ■ Origin Marketing (022-8801335) ■ Rashi Peripherals (022-8202288) ■ Roop Electronics (022-6631921) ■ Savex Computers (022-2881616) ■ Venptron Digital Systems (022-4375262) ■ Zeta Technologies (022-4102288)





IMAGING: Ram

**The Parhelia and the P10 will redefine the technologies used for 3D graphics. Enter the age of super realism where the differences between the surreal and the real world will blur away**

The past few years have seen some dramatic changes in the 3D graphics industry: the fall of a monopoly (3dfx), the rise of another (nVidia), the evolution of the graphics processor, and the rise of a contender for the top spot in the form of ATI. It has been an interesting ride for sure. But all along, the consumer has had little choice in what he could buy, and how much he had to pay for it. It was the economics of competition, or in this case the lack of competition, that had forced such a situation upon us.

But things seem to be changing. Competition as they say, is coming out of the woodwork. Companies long thought dead and forgotten have risen to lay claim to a slice of the market pie, and things will only get better. What is it about the current scenario that has companies feeling confident enough to take on the likes of nVidia and ATI?

Standardisation is the magic word. Thanks to the introduction of Application Programming Interfaces (APIs) such as DirectX 8 and the inevitable arrival of DirectX 9 and OpenGL 2.0, the playing field has been greatly levelled. By standardising what should go inside a 3D chip, smaller companies no longer have to worry whether the features they've introduced will be used by third-party developers. They can now concentrate their efforts on API compatibility, even as they

innovate in technologies that might give them an edge such as in terms of the product cost (a cheap yet powerful graphics chip like the Kyro II), or the market positioning of the product (a part designed for the notebook segment, for example).

We thus have solutions being offered by old favourites like Matrox and 3DLabs, and a few surprise entrants like SiS and VIA. The more interesting of these are the upcoming chips from Matrox and 3DLabs, if only because they are aimed at the high-end market, where the current giants (read nVidia and ATI) have a seemingly unbreakable hold.

### Powerfully Matrox

Think 2D quality, and a Matrox card comes to mind. For years Matrox has been the benchmark against which the 2D quality of any card has been measured. Add to that their DualHead technology, which allows a user to use two monitors simultaneously, and it's easy to see why Matrox has been a perennial favourite. For those who are sceptical of Matrox's ability to deliver a competitive 3D card, they have one word: Parhelia. Built using cutting-edge 0.15-

micron manufacturing process and powered by a whopping 80 million transistors and a 512-bit architecture, the Parhelia-512 promises a new level of visual quality and blazing next-generation performance. And it is aimed straight at 3D gamers.

### The right stuff

The Parhelia has its memory running at a staggering 325 MHz DDR (effectively 650 MHz). Add to this the 256-bit-wide memory interface, and you get an effective bandwidth of 20.8 GBps. Not impressed? Compare this with the 8.8 GBps bandwidth of the ATI Radeon 8500 and the 10.4 GBps boasted by the nVidia GeForce4 Ti 4600, and you can easily see that the Parhelia has the power to make light work of just about any 3D scene. However, the

chip is not DirectX 9 compliant. While it does support DirectX 9 vertex shaders, it is limited to v1.3 pixel shaders, and is thus not a true DirectX 9 part.

### Of pixel and vertex shaders

The Parhelia integrates four Microsoft DirectX 9 compatible vertex shader units into a single vertex processing array and is able to sustain very high performance lev-





els even when executing complex vertex shader programs on high-resolution 3D models. Upcoming games such as *DOOM III* use more than one texture on the models within the game. These multiple textures give the models a more natural look, allowing an in-game car to have a metallic shine, or for a monster to sport a more believable snarl. This multiple-texturing will force cards such as the GeForce4 to take more than one pass to texture a particular model. The more the number of passes needed, the slower the game will run. Parhelia-512 is the first GPU to sport four vertex shader units, enabling the chip to process up to four textures in a single pass. This architecture can also be helpful in current games, which do not use four multiple textures on their models. For example, any game using the *Quake III Arena* engine uses not more than two textures for their models. In situations like these, the Parhelia can use its two idle shader units to perform anisotropic and trilinear filtering at virtually no performance hit.

The chip is not slack in the pixel shader department either. With four programmable texture and five programmable pixel shader stages on each of its four pixel pipelines, Parhelia's 36-stage Shader Array boasts the largest and most powerful pixel rendering pipeline to date. The array will allow the chip to handle up to 10 pixel shader operations across two pairs of pixel pipelines in a single pass if necessary, and

although this has its drawbacks (in terms of loss of pixel fillrate), the efficiency gained will allow games to sport effects which are highly impractical as of now.

## Visual volleys

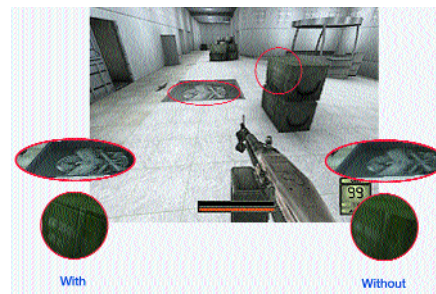
Parhelia-512 also offers a host of other 3D scene and desktop enhancing features:

■ **10-bit GigaColor Technology:** GPUs have to deal with a lot of number-crunching—vertex shader operations, pixel shader operations, filtering, and antialiasing. The current 32-bit colour system gives each colour channel, viz. Red, Green, Blue and Alpha (used for transparency) an 8-bit value. This is not sufficient to accurately portray a pixel—since it goes through so many mathematical operations, there is bound to be some data loss. The results are artefacts like banding and discolouration. The Parhelia takes the first small step towards alleviating this problem. By re-distributing the 32-bits currently available, as 10-10-10-2 (RGBA), Matrox has allowed for a four-fold increase in accuracy per individual colour channel. As a result, the Parhelia is capable of simultaneously displaying over one billion colours. Full 10-bit colour precision is available for 2D, 3D, DVD and video.

■ **64 Super Sample Texture Filtering:** Most video cards today have a standard pipeline structure—their four pixel pipelines each consist of two texture mapping units (TMU) to form a 4x2 structure. The Parhelia makes a stark departure from

this norm and boasts of a 4x4 pixel pipe/TMU structure instead. This gives the chip an advantage while filtering textures—a process that gives a game a more clear and artefact-free look. While present cards are brought to their knees with trilinear or anisotropic filtering turned on, thanks to the power of its 4x4 pipeline, the Parhelia can yield 16 bilinear texels or eight trilinear texels or one anisotropic filtered texel per clock, providing a fast, efficient and beautiful solution.

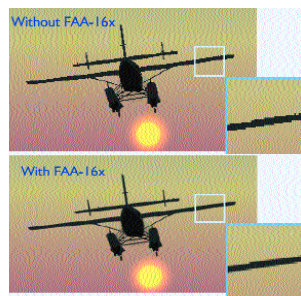
The Parhelia has advanced texture fil-



*The Parhelia's advanced texture filtering dramatically increases the level of details on textures. Notice the quality difference with this effect present and absent*

tering units which allow for the dynamic allocation of up to 64 texture samples per clock, which is double the number available on competing GPUs, resulting in improved visual quality.

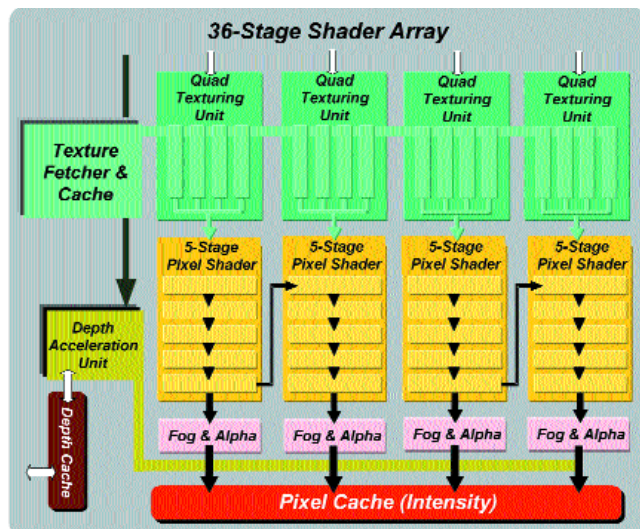
■ **16x Fragment Antialiasing (FAA-16x):** Antialiasing refers to the process of removing the jagged edges of on-screen 3D objects and models. Current video cards employ a variant of the so-called full-screen antialiasing process (FSAA), where entire polygons are antialiased en masse. This method is highly inefficient and consumes a lot of memory bandwidth. The Parhelia follows a more conservative process: instead of antialiasing entire polygons, it identifies just the edge polygons and removes the jaggedness off their borders.



*Maximum antialiasing quality with minimal performance overhead, all thanks to an intelligent approach*

Matrox claims that edge pixels constitute only about 5 per cent of on-screen real estate per frame. Since it has to work on such a reduced number of pixels, the Parhelia can apply a very high 16x super-sampling solution, without a significant performance hit. However, this process is not compatible with all games and it cannot remove artefacts from textures (like pixel-popping) that traditional FSAA solutions can.

■ **Hardware Displacement Mapping (HDM):** The goal behind HDM is to generate more realistic 3D terrain and characters. The process is quite similar to bump-mapping: keeping in mind the type



*The Parhelia has four pixel pipelines, each with four quad-texture units. The vertex processing array has four vertex shading units coupled with an instruction cache. Hence, four textures can be used per clock. Each texture unit is then interfaced to a five-stage DirectX 8.1 pixel shader. The entire texture processing engine supplies data to the rest of the core via a 512-bit internal controller*



insight ■

insight ■

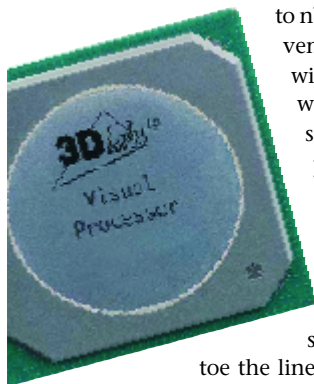


*Parhelia's surround gaming bridges the gap between virtual-reality and reality*

centre gives you the normal view, while the two adjacent ones, show you what to expect on your left and right hand sides. All three combine to give you a complete picture along with a peripheral view. The technology will serve you even better in a flight-simulation game, where positional awareness can mean the difference between life and death. This is Surround Gaming, and the technology can well extend to your office work, where you can browse the Internet, work in Photoshop and write a Word document, all on separate monitors running on the same PC.

## 3Dlabs' P10

Creative has long presented consumers with 3D solutions based on chips ranging from 3dfx's Voodoo Banshee to nVidia's GeForce. Its ventures have met with limited success, while its relationships with third-party video chip providers have always been shaky at best. Nevertheless, Creative seemed content to toe the line. Until it acquired



3Dlabs earlier this year, that is.

3Dlabs was working on a new 3D chip, and the powers-that-be at Creative were so impressed by the technology behind the chip and the promise it held in terms of market penetration, that they decided to buy 3Dlabs outright. This decision gives Creative a degree of control over when and how the chip is developed. The relationship will work along these lines: 3Dlabs will continue

as designers and developers, while Creative will market video cards based on these very chips, all the while lending a helping hand in tasks ranging from driver development to marketing.

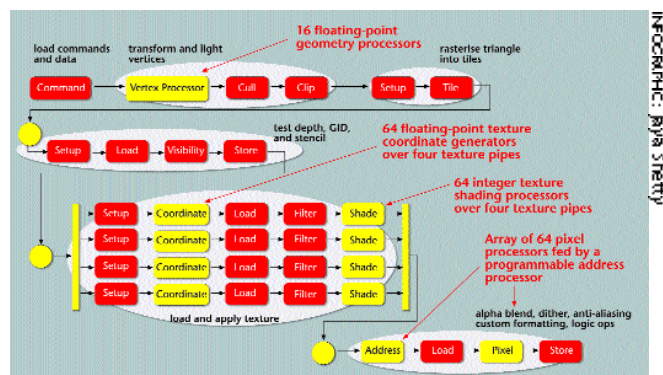
## When a CPU meets a GPU

Developments in the CPU industry and the graphics chips industry have followed some amazing parallels. In the early days of Voodoo cards, every 3D feature, every neat trick was hardwired inside the chips. This fixed-functionality brought amazing speeds but severely hampered innovation and creativity. Then nVidia with its GeForce 256 chip and later on ATi with the Radeon 7500, introduced bare-bone programmability in their respective offerings. It was like moving from a calculator that could only perform certain tasks, to the early Intel chips that allowed for assembly programming. The GeForce 3 and 4, and the Radeon 8500 have taken the next logical step, extending the programmability from the vertex level to the pixel level—but the gaming industry is demanding more: a completely programmable graphics processor, to be precise.

This is where 3DLabs has stepped in. Although the P10, the latest chip to come from the 3DLabs drawing board, is not a completely programmable solution, it is as close to the real deal as current manufacturing technologies can allow for.

## Innovations throughout

So just how programmable is this new chip? There are over 200 32-bit floating-point and integer processors built into the P10. These are all general purpose processors, with



The P10 has 16 floating point geometry processors that work in parallel. These feed data through the transform and lighting data path. The texture processor contains 128 32-bit SIMD processors (64+64), enabling the P10 to process eight simultaneous textures. Yet another set of processors is available for additional pixel operations. All of this makes the P10 capable of multithreading

addressing, looping and subroutine capability. All programmable, together they have earned the chip a new acronym: VPU, short for Visual Processor Unit.

The P10 has 16, separate 32-bit floating-point geometry processors, which handle the vertex processing. This array of 16 vertex processors is the P10's equivalent of vertex shaders and they offer full DirectX 8 and 9 support. Also noteworthy is that the final stage of the rendering pipeline is also completely programmable. What this means is that developers can apply custom filtering methods if the standard bilinear/trilinear filtering doesn't suit their needs. Also programmable is the type and the extent of antialiasing that can be applied to the final output. Because of this final rendering stage, the P10 can be programmed to support greater colour depths, offering even 64-bit colour. The VPU from 3DLabs also has 10-bit DACs to take advantage of the custom 10-10-10-2 (RGBA) mode.

Then there's the multi-threaded Command Processor that enables the P10



*The accuracy provided by a 64-bit colour depth has helped movie companies such as Pixar bring their digital worlds to life. Programmable chips like the P10 will allow game developers to have a similar level of visual quality at minimal performance hit*

New 3D Chipsets on the Horizon				
Manufacturer	nVidia	ATi	Matrox	Creative/3Dlabs
Chip name	NV30	R300	Parhelia-512	P10
Cards shipping	Q4 2002	Q3 2002	Q3/Q4 2002	Q3/Q4 2002
Manufacturing process	0.13 micron	0.15 micron	0.15 micron	0.15 micron
DirectX support	DirectX 9	DirectX 9	DirectX 8.1, and preliminary DirectX 9	DirectX 8.1, and preliminary DirectX 9
Output support	Multihead, DVI/TV-Out	Multihead [HydraVision] DVI/TV-Out	Multihead [TripleHead & Surround Gaming], DVI/TV-Out	Unknown
Memory support	256-bit DDR 256 MB	128-bit DDR [possibly 256-bit DDR]	256-bit DDR 256 MB	256-bit DDR 256 MB
Rendering pipelines	8	8	4	4
Pixel shaders	2 x DirectX 9	4 x DirectX 9	4 x DirectX 8 (PS 1.3)	4 x DirectX 8 (PS 1.3)
Vertex shaders	4 x DirectX 9	2 x DirectX 9	4 x DirectX 9	4 x DirectX 9
AGP support	AGP8X	AGP8X	AGP8X	AGP4X
Antialiasing	8x AA	ATi Smoothvision Supersampling	Edge AA (16x)	Programmable Edge AA, 8x Multisampling
Rendering precision	64-bit (floating point)	64-bit (floating point)	40-bit (fixed)	64-bit programmable (fixed)

to effectively act as multiple virtual VPUs, a technique very similar to Intel's hyperthreading for Pentium 4 CPUs. It allows for fast task-switching between multiple 3D applications and plays an active role in any multithreaded 3D application where the VPU has to work upon multiple threads. This will be used extensively in Microsoft's next generation operating system, Longhorn, but doesn't make a great deal of sense from today's standpoint.

### Wait, there's more

The P10 interfaces with its DDR memory using a 256-bit memory controller interface, as opposed to the current generation 128-bit architecture. This gives the P10 a memory bandwidth of 20 GBps. Moreover, 3Dlabs offers a Virtual Memory Architecture that is quite similar in technique to how current CPUs manage mem-

ory. It allows the chip to seamlessly access textures regardless of whether they are physically present in the video card memory (locally) or in the system RAM. As you can see, the P10 really goes a long way in blurring the line between a CPU and a graphics chip.

### API support

The P10 supports DirectX 8 and its support of DirectX 9 extends to the new vertex shader implementation (Vertex Shader 2.0), but stops short of Pixel Shader 2.0 support. Since 3Dlabs has taken an initiative in defining the OpenGL 2.0 standard, it is to be expected that the chip will support the standard to the fullest extent possible. Furthermore, the flexibility granted to the P10 by its programmable architecture, should ensure that any future additions to either DirectX 9.0 or OpenGL 2.0 could be easily implemented into the chip.


### What lies ahead

The game industry is very unkind to newcomers. Unless the product has a significant market share, no developer is going to spend time and money developing their next big thing on new hardware. This is why something seemingly trivial as 32-bit colour in 3D games took as long as it did to arrive. This is also why it is only now that we see

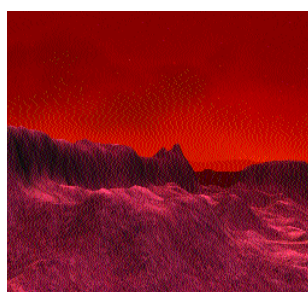
titles demanding T&L hardware and 32 MB of onboard RAM. What all of this implies is that a newcomer will have to toe the API line—any innovative feature introduced in their chip will be stillborn unless it is supported by at least one, if not both DirectX 9 and OpenGL 2.0 APIs. And this will possibly be the biggest challenge to counter.

### No sleeping giants, these

Meanwhile the leaders, nVidia and ATi, are busy trying to best each other. nVidia has fallen behind its six-month product cycle, some say no thanks to the Xbox; and ATi has taken every advantage of this fact. ATi's latest offering, codenamed the R300 is slated to be released in a few months, while nVidia's next chip, the NV30, isn't expected to go into production until late this year. So if everything goes right for ATi, they have nothing but a possibly faster GeForce 4 part from nVidia, to come between them and the pole position—at least for a period of four to five months, by which time the NV30 should be out.

It will have to be amidst this war that the new contenders would have to unfurl their own banners, and hope that the market pays attention. It is going to be a long and bloody war, fought on fronts ranging from technology, to driver quality and game compatibility, to the all-important price factor. It might get messy, but the ultimate winner will be the consumer. 

HATIM KANTAWALLA and AHMED SHAIKH



The pictures above show how Parhelia handles Hardware Displacement Mapping (HDM) by creating a mesh and superimposing a displacement map on it. Although the P10 doesn't count HDM as a unique feature, the 3Dlabs chip can produce similar results using its programmable architecture





# POWER PROTECT YOUR PC

Spare a thought for your electronic equipment and learn to protect it from the vagaries of Indian power conditions

Power failures are something we have all experienced at some time or the other. Whether you live in a metro city where there is relatively 'cleaner' power or in a smaller city with regular power outages, power problems can throw a spanner in the works of our electricity dependent lifestyles. This applies in an even greater degree to large cities—here electricity is the life force behind the equipment that we have grown so dependant upon. Office and home desktop computers, company networks and communication systems such as phones and fax systems—if any of these undergo a downtime during working hours, it spells a substantial loss of money and worse still, data. Besides, with the advent of the monsoons, the reliability of power delivered to our homes and offices reaches higher levels of unpredictability.

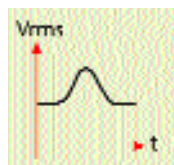
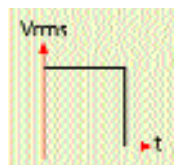
## Without power...

Just as in any other combat situation, you need to know what you are up

against before choosing your line of defence. There is a general misconception that a power failure comprises of just one situation—a blackout. This is but one of several problems when it comes to power failure. The following are the different types of power conditions that can occur:

■ **Blackout:** This is when there is a total power failure. It is akin to a light being switched off—the power from your electrical outputs falls from its normal level to zero.

■ **Brownout:** This is a condition where the output voltage drops to a lower level than its normal value (230 volts in India) for an extended period of time. This can affect the operation of electronic equipment and even cause damage to it.



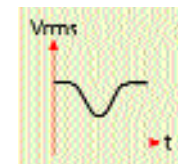
## ■ Power surge:

Here, the power level rises above the normal value for a period and then drops to the normal value. This condition can be detrimental to electronic equipment and while most computer hardware can handle slightly higher input voltages over certain periods of time, powerful surges can spell instant death for electronics if they are not protected.



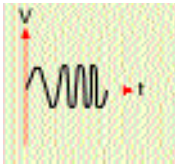
## ■ Voltage spike:

This is a condition where there is a brief impulse of a very high voltage after which it returns to the normal level. This condition can be lethal to sensitive electronic equipment including computers. Such conditions occur during lightning storms when a bolt of lightning hits a power line.



■ **Frequency variation:** Here, the frequency of the AC voltage differs from its

normal value of 60 Hz (the default frequency for conventional AC power in India). This can cause electronic equipment to malfunction and this is especially relevant to computers, as they are so dependent on frequency.



Each of these faults in power can be caused either due to faulty wiring (lack of proper earthing for your power lines), faults in the power lines themselves, errors in the power transmission grid and environmental conditions such as lightning and storms.

**...But not powerless**

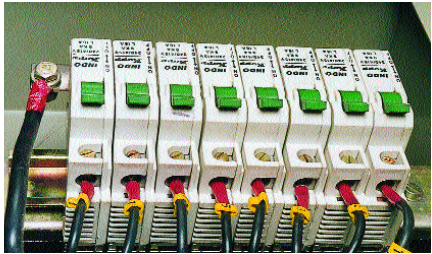
The implications and the extent to which each of these conditions can affect computer hardware are different. Accordingly, there are different solutions available to counter them. The solution you opt for is also decided by your budget and the level of protection you need for your computer hardware.

When combating power problems, there are several weapons with which you can arm your sensitive

electronics components.

■ **Circuit breaker:** This device is a switch capable of responding to dangerous overload levels in an electrical circuit. When installed, the switch detects if the current level of a line is too high and instantaneously (in tens of milliseconds) ‘trips’ and switches off. This effectively disconnects the circuit it is connected to and prevents the equipment on it from receiving dangerously high input power levels. However, since it effectively switches off the power, it’s a very ‘quick and dirty’ way to implement power protection.

Circuit breakers are particularly useful if you want to protect your computer from damage due to failure or malfunction of other equipment that is on the

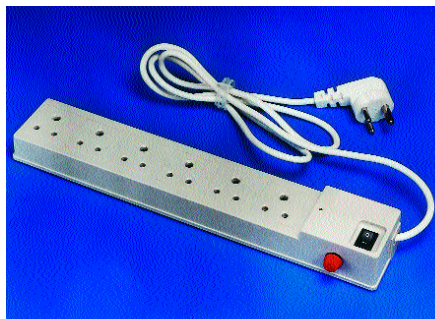


same circuit as your computer. The circuit breaker does not provide any backup power nor does it regulate the voltage reaching your equipment. For good power protection, this system should be implemented in conjunction with one or more of the other methods stated below.

■ **Spike buster:** This device is almost a standard piece of equipment with most new computer purchases. A spike buster (also called a spike suppressor) looks similar to a power strip that provides added power outlets, except that it contains circuitry that can detect impulse increases in the input voltage (spikes). When it detects a higher voltage, it shuts off and its fuse opens. This prevents a dangerously high voltage from reaching the equipment connected to the spike buster. Such devices can protect your computer in case of errors on the power lines or even lightning strikes, which can cause sharp voltage increases on power lines. However, in case of a power failure, a spike buster will not be able to power your equipment, hence it is still not the best way to implement power protection.







■ **Stabiliser:** A stabiliser is a slightly better device for power protection—it is capable of detecting both power surges and brownouts and can rectify them to deliver a regulated AC voltage to your computer. It continuously senses the input voltage (and in some cases even the output voltage). It uses a closed feedback circuitry to clamp the output voltage to a constant value by either ‘bucking’ (lowering) or ‘boosting’ (increasing) the input voltage, depending on its level.

The principal element of a stabiliser is a transformer whose output voltage is controlled depending upon the input voltage. It will control the output voltage between the low and high voltage thresholds at which the device operates, but if these limits are surpassed, it simply switches off. A stabiliser cannot regulate the frequency of the output voltage or provide any form of backup power, but it does provide adequate control of voltage for most applications in



## Choosing the Right UPS Rating

Nowadays, almost every piece of electronic equipment you buy specifies the amount of current it draws in amperes (A). Multiply this by the voltage we use (230 volts) and you get the VA rating. If the power rating is specified in watts, simply multiply this by a factor of 1.4 and you’ll get the VA rating. This is the amount of power the device draws. Now, if you simply add up the individual VA ratings of all the devices you plan to connect to your UPS and add a 10 per cent safety factor, you will be able to decide the rating of the UPS you need.

As an example, the average current drawn by a desktop computer today would be: 1.2 A for a 17-inch monitor and 1.1 A for a 1.4 GHz processor-based computer. After multiplying each of these by 230 volts, we will have a power rating totalling:  $276 + 253 = 529$  VA. This is a maximum-limit scenario considering that you will have a fully loaded computer system. Therefore, to be on the safe side, buy at least a 600 VA system to run your computer. To alleviate the load on your UPS, do not connect devices such as printers, scanners, speakers, etc.

case of occasional low-level fluctuations in power.

■ **UPS:** This is the most effective way to implement power protection. A UPS is a device capable of maintaining pure AC power and can even provide backup power in case of very poor input power or a power failure. Here, DC power provided by the UPS’ batteries is converted into AC power by an electronic circuit called an inverter. This gives clean power to the equipment connected to it.

There are three types of UPS systems in use—offline, on-line and line-interactive. In an offline UPS, the equipment is driven directly by the mains power as long as it remains within threshold limits of the minimum and maximum values. During this time, the batteries of the UPS are continually charged. In case of an extreme power condition or a power failure, the UPS switches over very quickly (usually under 5 milliseconds) to the batteries.

In an online UPS, the equipment is continually driven through the batteries even during normal conditions, during which time the batteries also charge. Therefore, this type of UPS understandably provides the purest form of power



protection available—no matter what the input power conditions, the output power is provided through the battery.

A line-interactive UPS system is a hybrid between the two preceding types—it incorporates a transformer that controls the output voltage within a specified range and allows the batteries to kick in only if this range is exceeded. This method overcomes the need for the UPS to switch over to the battery every time even a slight voltage fluctuation occurs, thereby extending its lifespan.

Strip Ad

Which UPS is for me?		
	Single computer protection	Mission-critical applications
You need	Protection for a single computer comprising a monitor, system unit, keyboard and mouse, for example, a 1 or 2 GHz processor-based machine with a 20 GB hard disk, a CD/DVD-ROM drive, 256 to 512 MB of RAM and a 17-inch monitor	Protection for a server that needs to be continually running with mission-critical applications, for example, a 1 GHz-processor, with up to 1 GB of RAM, up to four SCSI hard disks, a CD-ROM drive, backup device and a 17-inch monitor
Look for	An offline or line-interactive UPS with a VA rating of 450 to 650 VA and with a backup time of 10 minutes	An online UPS with a VA rating of at least 1 KVA and with a backup time of 10 minutes. It should also support remote monitoring through a serial port with alarms and indicators in case of power anomalies

By the power of a UPS!

A UPS is specified by its VA rating. This is a measure of the amount of power the UPS can provide and it usually lasts for about 10 to 12 minutes. Therefore, if a 500 VA UPS is loaded with equipment that draws 500 VA of power, it will last for about 10 minutes. If the load is halved to 250 VA, the backup time will increase to about 16 to 18 minutes. This is assuming, of course, that the battery is fully charged and functional. Hence, when buying a UPS system, you should first ascertain what equipment is going to be connected to it and more importantly, what kind of power conditions you want to protect your equipment from.

UPS systems should be used to power only the most critical parts of your computer (see box, 'Choosing the Right UPS Rating'). By connecting only the critical components, you will not overload your UPS and will therefore have longer backup times in the event of a power failure. Try not to connect peripherals such as printers or scanners to your system as these draw considerable power. Also, use the time the UPS is on battery not so much to work as to save your work and shut down the system normally.

■ **Input voltage range:** This is the range beyond which the UPS is going to deliver power through its batteries. The greater the range the UPS can handle, the more versatile its power protection. Look for a voltage range between 150 and 270 volts.

■ **VA rating:** This is a rating of the power that can be provided by the UPS. You should choose the rating on the

basis of the power requirements of the equipment you are going to connect to the UPS. As a rule of thumb, a 1 GHz processor-based machine with a 20 GB hard disk, a CD-ROM drive and a 17-inch colour monitor would require a 500 VA UPS.

■ **Backup time:** This is the specified time for which the UPS can provide power from its battery for a given load. Look for a backup time of at least 10 minutes at maximum load.

■ **Switching/transfer time:** Used interchangeably, switching or transfer time is the time taken by the UPS to switch from normal delivery power mode to battery mode when it detects power anomalies. Look for transfer times under 5 milliseconds.

■ **Alarms and connectivity:** Most UPS systems have LEDs on the front panel that indicate the state of the UPS' batteries and the condition of the input and output power. This visual indication of its operation is important especially during power failures—look for a UPS that features these indicators.

■ **Charging time:** This is the time taken to charge the UPS batteries from a completely drained state to a fully charged condition. This should be between 4 and 6 hours.

I have the power

They say that an ounce of prevention is better than a pound of cure. Invest in a suitable power protection system to safeguard your equipment and data, or else be a powerless spectator when your system gets zapped!

MARCO D'SOUZA

1 col AD



## Keep it Updated

When the Windows 95 TCP/IP stack was updated, not many people knew about it. Those who didn't update their operating systems faced a lot of problems with dial-up connections. Earlier, when anti-virus software did not have automatic update features, the software would become useless in just a fortnight. Users were ignorant about these updates and eventually faced several virus attacks. Now newsletters let you know of various critical updates. Oracle charges heavily for every update to their database software—one can even buy an annual Updates Subscription Service contract from them.



*UpdateExpert manages updates and patches across machines on a network*


## Look before you update

Not all updates are helpful and some fixes bring with it a dozen other bugs. As a standard practice to read the release notes thoroughly and find out what exactly the patch mends. Many security vulnerabilities arise only under certain conditions, which may not be applicable to your computer.

You can easily evolve a quick and easy method for taking critical backups. A snapshot of the registry can restore Windows to a healthy state when something goes wrong. Windows 98 automatically takes backups of the registry and Windows Me creates Restore Points,

by which you can roll back the complete system to any previous restore point. Sometimes system-critical files get overwritten with newer files, like when updating hardware drivers. In such a case, just a registry backup may not help. It's a good idea to clone your entire Windows installation regularly using a cloning software such as Norton

Ghost ([www.symantec.com](http://www.symantec.com)). Should the update cause problems, you can roll back to the last clone instead of reinstalling Windows.

Don't jump at updates unless they address an extremely critical, high-risk security issue. Always wait for a couple of days and let some experts try them out first. They can point out the importance of the patch, as well as potential problems with the patch itself. The experts may also be able to guide you to work around the problem without using the patch or fixing the problems that the patch brings with it. 

VEER KOTHARI

## Playing Catch up

From time to time, Microsoft releases Service Packs for Windows, Office and Internet Explorer. Each Service Pack is a bundle of all updates and patches for the software. If you haven't updated yet, just look up the latest Service Pack and install it instead of hunting for individual updates. Service Packs are also safer since they contain deployed, tested and extensively used patches. The original patch may have had another bug that would be fixed before including it in a Service Pack.

patches are applied and also results in smaller file downloads.

For Internet Explorer updates, visit <http://www.microsoft.com/windows/ie/default.asp> and look up 'Critical Updates' under 'Downloads'. A list of updates for your browser and related software with descriptions of each patch is provided. As with Windows and Office, you will find Service Packs that contain all patches before its release date. Be sure to check for patches regularly, since security holes can leave your PC open to hackers and worms as you use your browser online.

## Tools of the trade

There are several other tools, some free, others at a price, that let you manage bugs, fixes, updates and patches for Windows. They scan and monitor your system and inform you of possibly outdated files. Here are some of them:

### CNET CatchUp

<http://catchup.cnet.com/>

CNET CatchUp makes it very easy to download software updates and security fixes. Once installed, it will automatically take you to the service page where you can scan your PC for software, security vulnerabilities or even hardware and third-party components that require updating.

### PatchWork

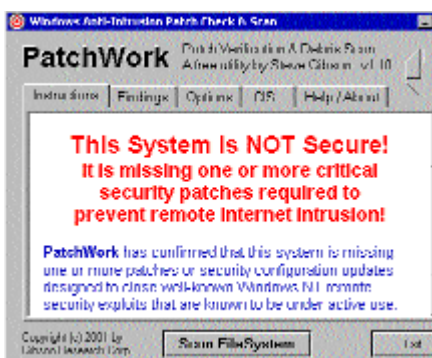
<http://www.cisecurity.org/patchwork.html>

PatchWork is a free utility that checks



CNET CatchUp scans your PC for out-of-date software

Windows NT and 2000 systems for documented vulnerabilities. As you launch the program, it tells you if your system is secure, the vulnerabilities found and even leads you to the sites where you can read more about the security threat. It also takes you to the Microsoft Windows Update site for getting the relevant updates. You can even set it to 'Quick Check' from 'Options' so that it runs automatically at startup.



PatchWork is a tiny tool that scans your servers for security holes

### UpdateEXPERT

[http://www.stbernard.com/products/updateexpert/products\\_updateexpert.asp](http://www.stbernard.com/products/updateexpert/products_updateexpert.asp)

UpdateEXPERT is a patch assessment tool for enterprises. It can scan networked systems for missing patches and fix the weaknesses it finds. It works with almost all versions of Windows, but comes at a price. The first time you run UpdateEXPERT, a wizard helps you set up the software for all the machines you want to manage. The software analyses and reports the status of every machine and advises on missing updates. Click on the bug to read its documentation, then right-click and select 'Install' to download and install the patch.

## Links Bank

**Active Network** is a complete resource guide for Windows and other Microsoft products. This site provides lists of bugs under various sections.

[www.activewin.com](http://www.activewin.com)

**Beyond-Security's SecuriTeam.com** is where you get your daily updates of security flaws and security-related tools. You can even get security alerts on your mobile phone or other handheld devices.

[www.securiteam.com](http://www.securiteam.com)

**BigFix** monitors your PC for bugs, security holes and viruses, and fixes them before they cause damage.

[www.bigfix.com](http://www.bigfix.com)

**BugNet** provides regular bug alerts for all kinds of software. You can even report any bugs you find, browse through the analysis of bugs and sign up for the free newsletter.

[www.bugnet.com](http://www.bugnet.com)

**Patchlink** boasts of being the world's largest repository of patches. They also have an enterprise-wide patch management software, but you have to pay for it.

[www.patchlink.com](http://www.patchlink.com)

**PCWorld Bugs and Fixes** has a comprehensive archive of bugs and patches for several software, which is regularly updated with new reports.

<http://www.pcworld.com/howto/locations/0,loc,12,00.asp>

**WinPlanet** gives regular news on all the flavours of Windows. It also links you to **WinDrivers.com**, where you can find the latest Windows drivers for all your hardware.

[www.winplanet.com](http://www.winplanet.com)

**WinPortal.com** is dedicated to Windows 2000. Apart from news and security threats, the software sections are very useful, with downloads to manage your applications, drivers, patches, etc.

[www.winportal.com](http://www.winportal.com)

**Woody's Office Portal** hosts e-zines on Office and Windows which can be subscribed to or read online.

[www.wopr.com](http://www.wopr.com)

**ZDNetIndia.com** not only has the regular news updates, but also two very good services: Virus Workshop and Security Central. This is where you can keep yourself updated on virus and security threats.

[www.zdnetindia.com](http://www.zdnetindia.com)



## Do you suffer from software rage? Bug-free software is just an update away

Every PC user has suffered through a software crash—it's universal and knows no caste, colour or creed. Though the crash may be due to hardware failure or electrical surges, most often than not, the software itself is to be blamed.

Developers walk the tightrope when it comes to software release deadlines. Cutthroat competition and pressing demands from customers drive software makers to tighten already unrealistic project schedules. Most developers put their development cycles on their Web sites and sometimes even take feedback from consumers during development. This compels them to shorten the test phase, and often the software is packed off with a few major and minor bugs.

Bugs can be broadly classified as security holes and software errors—the former is deadlier and often paves the way for the latter. Remember all those times Word crashed for no apparent reason? Or when Windows gave you the blue screen of death? These are software errors, which generally mean loss of data or just plain irritation. Security breaches are more dangerous and the software must be patched immediately, or else the system becomes vulnerable to hostile bodies.

### A stitch in time

Competition and customer complaints get software companies to release updates and fix bugs as and when necessary. There are various services on the Net that send out regular newsletters letting you know of bugs that have been discovered, along with the fixes and updates that have been released. Many software include an automatic update feature that regularly checks the developer's Web site, and downloads and installs the new version. This trend began with anti-virus software, trickled down to Internet-related software such as browsers and chat clients, and has now spread to office applications and operating systems. Many of these can be configured to automatically download and



PHOTOGRAPH: Jiten Gandhi IMAGING: Solomon Lewis

install updates, but it is advisable to have them ask for confirmation before installing the update.

Updates are not only patches for bugs. New releases of the software with added features, performance enhancements, better user-interfaces and higher customisability are also distributed through updates, usually free for existing registered users. Microsoft distributed two Service Releases (SR) for Office 97 that had patches for the bugs in the Office suite, especially Outlook, and enhanced the HTML support for Word. The support became dramatically better and Word crashed less often when working with HTML files.

### Updating Windows

The best place to get updates for Windows is right from the horse's mouth—Microsoft itself! If you are using Windows 98 or a later version and are connected to the Internet, click 'Windows Update'



Scan Windows 2000 PCs with MBSA

from the Startup menu or go to <http://windowsupdate.microsoft.com>. When you click on 'Product Updates', an applet will detect your operating system and give you a list of updates that it does not find on your computer. These are categorised as 'Critical Updates', 'Picks of the Month', 'Recommended Updates', 'Additional Windows Features' and 'Device Drivers'. Read through the descriptions of each update, select the ones you want and click 'Download'. The updates will be downloaded and installed on your PC.

If you are using Windows 2000 or XP, the Microsoft Baseline Security Analyser (MBSA) is a good tool to analyse your operating system and locate relevant patches for it. You can scan one or more computers with this tool and it provides you with options to check for weaknesses in Windows, passwords, Internet Information Services (IIS), SQL and hotfixes. The security report can be sorted by name or severity of the vulnerability. For each notification you can look up what exactly was scanned and how you can correct it.

Another handy tool for Windows NT and 2000 is QChain from Microsoft. It is a command-line tool that can install multiple hotfixes in one go, without requiring you to reboot after every patch. This is most useful with a fresh installation, or if you haven't updated your operating system for a long time.

### Updating Office and Internet Explorer

Just like Windows, Microsoft has a detection tool for Office 2000 and XP that locates updates for your suite at <http://office.microsoft.com>. Click 'Product Updates' and choose the automatic detection engine or just jump to the 'Download Center' and select the patches you want from the list.

Keep an eye out for Service Packs (or Service Releases), since this is the best way to update Office. At the Download Center, you can filter the list for specific applications rather than the entire suite. This gives you more control over what →



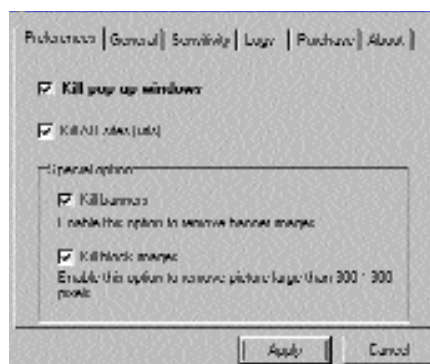
# 30 Minutes Expert

## Bust those ads

You are coasting along the cyber-bahn and suddenly get hit by a speed breaker in the shape of a popup advertisement. A picturesque image of Bali invites you for that dream vacation or a lissome beauty draped over a couch offers you information on a wireless camera. These popups are irritating to say the least while you are surfing around casually and especially so if you are working online. The solution? Install an ad buster and escape those nagging popups. AD Killer from [www.softcows.com](http://www.softcows.com) is one of the simplest and best ad busters. Installing and configuring the software is child's play.

### Preparing the 'hit' list

After you've installed AD Killer, launch the application from the **Start > Programs** menu. The software opens up in a small window. Here you can select the types of ads that you want to block. For instance, you

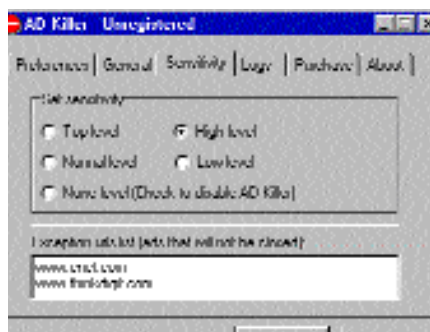


Select the kind of ads you want to block

can kill banners and block images that are larger than 300x300 pixels. Select the options as per your requirements and click on the 'Apply' button to close the window and activate AD Killer.

### Setting the rules

If you are still unable to stop some



Select the level of sensitivity, or select 'None' to disable Ad Killer when working with download managers

ads from popping up, it could be because the sensitivity level is set to 'Low'. For instance, if you've selected a low level of sensitivity, the software will only block ads that match a few standard rules, such as images served from familiar ad servers or images that follow the standard banner ad sizes, or text that contains words such as buy or save. On the other hand, selecting 'Top level' will block all the popup windows, but this will slow down your surfing speed as AD Killer will prefetch the data, analyse it and then serve up the Web page sans all popups.

You can change the sensitivity level through the 'Sensitivity' tab in the application window. Alternatively, right-click on the AD Killer icon on the system tray to change the level of sensitivity.

You can also disable the application by choosing 'None' under the 'Sensitivity' tab. This option would be required when working with download managers, which have popup windows for individual software downloads. To prevent these windows from being closed accidentally, you can temporarily disable AD Killer.

### Exceptions to the rule

### Other Options

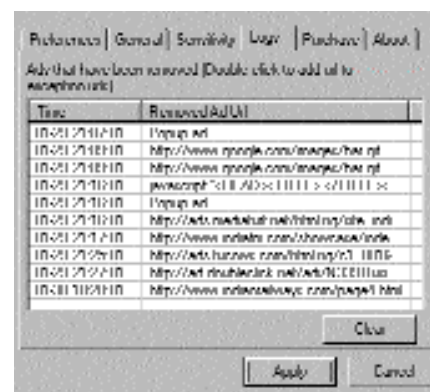
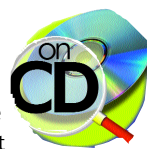
**AdSubtract:** This ad removal utility also blocks cookies and removes those that are already installed. It can also clean up your temporary Internet files and the browser's history log. Browsing speed might be hampered as AdSubtract prefetches sites to remove ads.

[www.adsubtract.com](http://www.adsubtract.com)

**Ad Free:** This software filters the content you browse and blocks sites that provide banners. It can also block any server you don't want to access.

**Pop-Up Stopper Pro:** This software lets you block certain ads while allowing certain others and plays sounds while ads are being blocked. It supports Windows XP and has a special feature that lets you locate your last downloaded file.

[www.panicware.com](http://www.panicware.com)



Check the ads trapped by AD Killer

You might want some popup windows to load when you visit certain sites. You can key in these sites in the 'Exception URLs list' under the 'Sensitivity' tab and AD Killer will ignore the popups when you visit those sites.

### Keeping tabs

If you want to check what ads were blocked and which sites they originated from, click on the 'Logs' tab in the AD Killer window. You'll find a chronological list of all the ads that were blocked. If you find a site that has popup windows that





## Using NTFS with Linux, MP3 players that won't play CDs, a misbehaving Word, we've got a cure for everything

### Truant Word 2000

**Q.** Whenever I try to open Word 2000, the Windows Installer starts up in Windows XP Pro as well as in the previous version operating system. Why does it behave so?

**Anurag**

*Via e-mail*

**A** Check whether the Microsoft Office 2000 installation was done under a different user profile. If so, then this is normal as different profiles require some additional files to be installed. Let the Installer come up and add whatever files it needs. Once it has installed the necessary files, it should not pop up again when you open Word 2000. Note that the installer may come up again if you access a function in Word that has been set for install on first use.

### Graphics card problem

**Q.** When I try to install *Quake III* on my PC, it says that my video card does not support OpenGL. I am using a SiS 6326 AGP card. What is OpenGL and how can I check whether my card supports it? Can I play the game after a

software upgrade?

**Azam Khan**

*Via e-mail*

**A** SiS 6326 does not support OpenGL and you would not be able to run *Quake III* with this card. OpenGL is an environment for developing portable, interactive 2D and 3D graphics applications. For more details visit [www.opengl.org](http://www.opengl.org).

You can use Scitech GLDirect 2.0 ([www.scitechsoft.com](http://www.scitechsoft.com)), a tool that emulates OpenGL, but the

gameplay will be pathetic even at the lowest graphics settings. To be able to play the game

you should upgrade to a TNT2 M64 32 MB graphics card or better.



GLDirect 2.0 emulates OpenGL

### Updating the BIOS

**Q.** I have a PC with the following configuration: Intel ZX 98 AT version 00912 motherboard, Celeron 300A processor, nVidia Riva TNT2 M6432 MB graphics card, a 20 GB hard disk, and 64 + 128 MB SDRAM.

When I used SiSoft

### No six-channel output

**Q.** I bought an ASUS A7N266-E motherboard with Dolby Digital, GeForce2 MX and six-channel support. My operating system is Windows XP, and I have installed the ACR-6H card and the drivers that came with the board, but the problem is that I don't get six-channel output. I have a 5.1 speaker system but I get sound only from the front speakers.



The dealer tells me that the six-channel output is only enabled when you play DVDs using PowerDVD XP software. Is this true?

**Sameer**

*Via e-mail*

**A** Your dealer is completely wrong!

However, there is nothing wrong with your motherboard. The problem you are facing now is just because of an outdated driver. Download the latest Windows XP drivers from the manufacturer's Web site and you will be able to hear sound from all the speakers.

Sandra, it recommended upgrading the BIOS. How do I do that? From where do I get the BIOS that supports my motherboard?

**Kamlesh Maru**  
Via e-mail

**A** Flashing the BIOS is not recommended unless absolutely necessary, since an error while flashing may make the motherboard unusable. If your PC is working fine, there's no need to 'fix' it. To learn how to flash your BIOS, refer to 'Flash Forward' in the June issue of Digit.

### Slow data copy speeds

**Q.** I have recently purchased a 24x CD-Writer. I have a 52x CD-ROM drive and there is a huge difference in the copy speeds of my CD-Writer and CD-ROM drive. When I copy a 650 MB VCD from my CD-Writer, it takes 8-10 minutes. However, when I copy the VCD from my CD-ROM drive, it takes a whopping 25 to 30 minutes. What causes this difference in speeds? After all, my CD-ROM drive is not much older.

**Amit Mehta**  
Via e-mail

**A** The difference in copying speeds could be because your CD-Writer is functioning at a higher transfer mode

(UDMA 2 or 4, depending on the CD-Writer), while your CD-ROM drive is functioning in PIO mode.

Ensure that the Ultra DMA modes for each drive are set to Auto in the Integrated Peripherals section of the BIOS. You can access the BIOS by pressing [Delete] when you get the Power-on Self Test screen during boot-up. Now restart the PC and enable DMA. For this, press [Windows] + [Pause Break] to launch System Properties. In the 'Device Manager' tab, click on the + sign next to CD-ROM and select the CD-ROM device installed on your PC. Then click on **Properties > Settings** and click on 'DMA'. This will result in a considerable increase in CD-ROM access and copying speeds.

### Linux and NTFS

**Q.** I have a Compaq PC with a 1.5 GHz Pentium 4 processor, 256 MB RAM, and a 40 GB hard disk. My hard disk has two partitions: 34.5 GB, with NTFS file system and 2.72 GB with FAT32 file system.

These partitions came with the system with Windows XP Home Edition preinstalled by Compaq. Can I also install Linux on the above mentioned file systems or will I have to create a separate partition? Also, can Linux access the documents on Windows XP?

**Ladoo**  
Via e-mail

**A** You will have to create a separate partition for Linux. The kernel shipped with most Linux flavours is not compiled with NTFS file system support.

So first you will have to compile the latest kernel with NTFS (Read Only) support because NTFS write is dangerous and is still in the experimental stage. Next, mount the NTFS partition in Linux.

You will now be able to access the files in the NTFS partition. If you want Read Only access to the Linux partition from your Windows partition, you will need a utility called *explore2fs*, which can be downloaded from [uranus.it.swin.edu.au/~jn/linux/Explore2fs.htm](http://uranus.it.swin.edu.au/~jn/linux/Explore2fs.htm).

### Error starting HTML documents

**Q.** I use Windows Me on my Pentium III machine, which has 128 MB RAM. Whenever I try to start MS FrontPage or any HTML document in Windows, I get the following error message: 'The MSVCRT.DLL file is linked to missing export MSVCRT.dll:??\_U@YAPAXI@Z'. What should I do to get rid of this message and start my HTML files and FrontPage? I also have to use a function called TweakUI from the Control Panel for extra settings and I usually play games.

**Amit K.**  
Via e-mail

**A** This behaviour may occur after you install a program that overwrites either the *Msvcrt.dll* or the *Msvcrtdll* Windows system files with an incorrect or previous version, or if one of these two files is damaged or missing.

To rectify the problem, you can navigate to **Start > Program Files > Accessories > System Tools > System Information** and click on 'System File Checker' under the 'Tools' menu. Alternately, you can also type *SFC* in **Start > Run** to get to System File Checker directly. Once there, select the 'Extract one file from install disk' field to extract a file from your Windows Me CD. Specify the name of the file (*Msvcrt.dll*) and click 'Start'.

If you have an original equipment manufacturer (OEM) installation of Windows Me, the Windows installation files may be

stored in *C:\Windows\Options\Install*. In the 'Save File' box, type *C:\*, and then click 'OK'. You will receive the following message: 'Extract File. The destination folder *C:\* does not exist. Do you want to create it?' Click 'Yes', and then click 'OK'. Repeat the above steps for *Msvcrt.dll*.

Insert your Windows Me Startup disk, restart the computer, and then select **Minimal Boot** on the Microsoft Windows Millennium Startup Menu that appears.

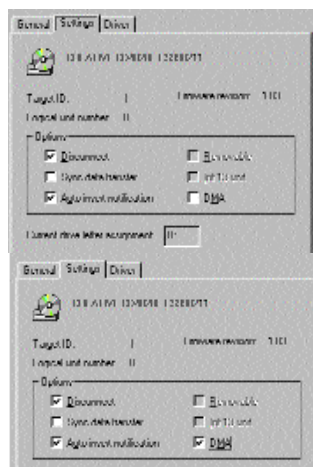
At the command prompt, type **Ren C:\Windows\System\Msvcrt.dll Msvcrt.old**, and press [Enter]. Type **Ren C:\Windows\System\Msvcrtdll Msvcrtdll.old**, and press [Enter]. Type **Copy C:\Msvcrt.dll C:\Windows\System**, and then press [Enter]. Type **Copy C:\Msvcrtdll C:\Windows\System**, and then press [Enter].

Remove the Windows Me Startup disk, and restart the computer.

### Problem accessing Linux

**Q.** I have two PCs: one is a Pentium III 933 MHz machine, using a Gigabyte motherboard, and the other is a Pentium 4 1.6 GHz machine, using an Intel D845WN motherboard. Both machines have a 40 GB hard disk, and 128 MB SDRAM.

The P-III machine has four partitions; one each for Windows 98, Windows 2000, Windows XP and Red Hat Linux 7.0. In this machine the Linux Loader (LILO) is seen on booting the machine, i.e. during bootup, you are prompted to choose between Linux and Windows and if you choose Windows, then to choose between Windows 98, Windows 2000 and Windows XP. The Pentium 4 machine has six partitions plus a Linux partition. It has two operating systems: Windows 98 and Windows XP. But on installing Linux, LILO



Enabling DMA for faster data access

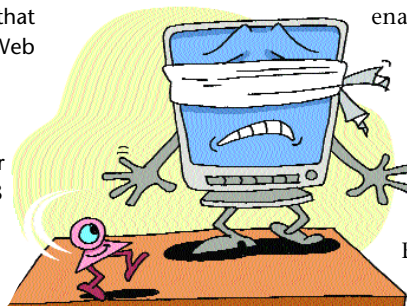


## Web cam not detected

**Q.** I have a Celeron PC running Windows 98. Recently I bought a new Web cam. My problem is that when I connect the Web cam to a USB port, Windows does not detect it. I installed it on another computer with the Windows 98 setup, and it worked just fine. What could be the problem?

**Prashanth**  
Via e-mail

**A.** It is possible that the onboard USB is not enabled in your motherboard. To enable onboard USB, you need to access BIOS setup (Press [Delete] when you get to the Power-on Self Test screen during bootup) and select the 'Integrated Peripherals' option. Here you will find the options to enable/disable onboard USB. Enable it and restart your machine with the device plugged in. Your PC should now be able to detect your Web cam.



ILLUSTRATIONS: Mahesh Benkar

does not appear. On booting the machine, it directly shows the Windows 98/Windows XP boot screen and to access Linux I have to insert the boot diskette for Linux. Why is this happening?

**Sanjeev Chharia**  
Via e-mail

**A.** There are two possibilities as to why this is happening:  
■ Linux gives users an option for selecting the location where the LILO needs to be loaded—you can opt for the MBR (Master Boot Record) or the first sector of the hard disk. In case it is loaded in the first sector of the hard disk, you will not get an option for selecting Linux as an operating system. To select Linux through a menu option, LILO must be loaded on the MBR.

■ While installing various operating systems on a single machine, all Microsoft operating systems need to be installed before you install Linux, as Microsoft boot loaders do not have any option of either writing to a specified location or appending the MBR. To get a selection of all the operating systems through LILO, you must always install Linux last. Hence, you might need to reinstall Linux.

## Ctfmon.exe launches at startup

**Q.** Recently, I found a file

named ctfmon.exe in the startup tab in System Configuration Utility. I don't remember enabling this file to be launched at Startup. Now, when I press [Ctrl] + [Alt] + [Delete], this file gets listed. When I click on it and click 'End Task', a popup window appears saying that the application is not responding. Ctfmon.exe is found in my windows\system directory. Even after I disabled it in the Startup tab, it starts automatically when I restart my computer. What is it and why is it acting like this?

**K. Mohan Doss**  
Via e-mail

**A.** Ctfmon.exe is a file that activates the Alternative User Input and the Microsoft Office Language Bar in Office

XP. It monitors the active windows and provides text input service support for speech recognition, handwriting recognition, keyboard, translation, and other alternative user input technologies. Removing or deleting this file might cause your Office XP programs to behave erratically. So instead of deleting it, the proper procedure is to run the Office XP Installer and access the **Maintenance Mode > Add/Remove features**. Here, choose the 'Installation' option for all Office applications and tools and select 'Office Shared Features' through which you can remove Alternative User Input (select 'Not Available'). This should fix it.

## VB Runtime Error

**Q.** I have a Celeron 366 MHz machine with 128 MB RAM and I have Windows 98 installed. When I run certain programs I get an error that says, 'MSVBVM50.DLL missing. Illegal operation'. What does this mean?

**K. Vashani**  
Via e-mail

**A.** Msvbvm50.dll is the Visual Basic Virtual Machine and is the required run-time

library for Visual Basic 5.0 applications. This error message pops up when either the file is corrupted or when it has been overwritten by an older version. The version of Msvbvm50.dll that is included in Windows 98 is 05.00.4319. You can download this file from <http://download.microsoft.com/download/vb50pro/utility/1/win98/EN-US/Msvbvm50.exe>

## Error starting Yahoo! Messenger

**Q.** I have a PC with a Pentium 100 MHz processor, 16 MB RAM and 2 GB hard disk. Recently, I downloaded and installed Yahoo! Messenger, but when I started it, I got an error message saying 'Error Starting Program, The YPAGER.EXE file is linked to missing export COMCTL32.DLL:\_Track Mouse Event'. What does this mean?

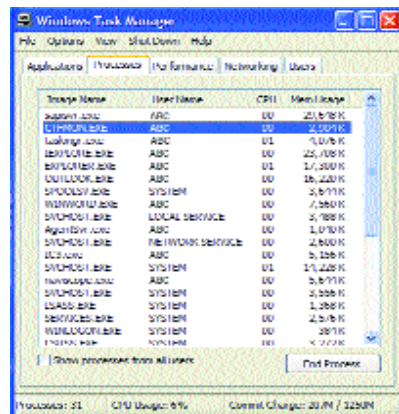
**V. Sule**  
Via e-mail

**A.** This problem is caused by an old system file on your computer, which needs to be updated. The only way to do this is to install Internet Explorer 5 on your computer. If you use Netscape as your browser, even then you'll have to install Internet Explorer to get rid of this problem—you don't have to use Internet Explorer, just installing it is sufficient.

## CDs don't play in MP3 player

**Q.** I face a problem while playing songs on my MP3 player. I convert CDA format into MP3 format using Gamut Player or Audiograbber software. I write them onto a CD using a 16x CD-Writer. This is where the problem starts—the CD plays on my PC, but refuses to play on my player. How do I fix this?

**Sachin**  
Via e-mail



Ctfmon loads when speech recognition is selected

## FAQs

### Buffer underrun

**Q** I have an 8x CD-Writer, but I get a 'Buffer underrun error' while writing and the writer stops. However, when I replace it with another writer of the same speed, on the same machine, using the same software (WinOnCD), it writes just fine. What could be the problem?

**Akhil Mehta**

Via e-mail

**A** To fix this problem, first, create more swap memory on your hard drive. To do this, right-click on 'My Computer' and click on 'Properties' or press [Windows] + [Pause Break] to get to 'System Properties'. Here, navigate to **Performance > Virtual Memory** and select 'Let me specify my own virtual memory settings'. Enter

two-and-a-half times the amount of RAM you already have in the 'Minimum' and 'Maximum' fields (for example, if you have 64 MB RAM enter 160 in both fields).

Don't use other applications when burning a CD. Make sure the firmware of your CD-Writer is updated. Also check whether the cache of your CD-Writer is corrupt.

### Games not playing

**Q** My PC has a P4 1.5 GHz processor, 128 MB RAM, nVidia TNT2 graphics card and 40 GB hard disk space. Whenever I try to run *Tekken III* or *WWF Smack Down II*, it gives an error message that says, 'CVGS requires a Pentium class processor with MMX.' Why does this happen?

**Abhishek Dey**

Via e-mail

**A** Your problem can be solved by updating the drivers for your motherboard and graphics card. Download the latest drivers from the respective vendor's Web sites and then try running the games. If the problem still persists, it may be because of the games themselves. Some old games do not run on the latest hardware since they've been written for an older architecture. This is rare, but it's known to happen.

### TV output through graphics card

**Q** I recently bought a GeForce2 MX with 64 MB RAM and TV-Out option. One of the main reasons I bought the card was to play games on my TV, however I haven't been successful so far. I cannot play games at whatever

configuration I choose. Why is it so?

**Harish Rao**

Via e-mail

**A** First, download the latest drivers for your video card from the vendor's Web site and install them. Second, check if the S-Video cable is connected firmly at both the ends (the TV as well as the graphics card). Then, select **Display Properties > Additional Properties** and select 'TV' as the device. When you have verified that all connections are proper, check if you have chosen the correct video input on your TV (either cable, S-Video or composite video). Finally, ensure that your TV set has an option for multiple video inputs, since some have only one composite connector.

**A** It could be that your MP3 player does not support or recognise CDs burnt at 16x or higher speed. Try burning the CDs at a lower speed (4x or 8x).

### GeForce4 Problem

**Q** I have a Pentium 4 1.4 GHz processor using an ASUS P4T motherboard with 256 MB PC800 RDRAM and the Sound Blaster Live! Platinum soundcard—all encased in a cabinet with a 350 Watt SMPS and a double fan ventilation system. The OS is Windows XP Pro with all the latest updates. I use a 17-inch monitor with the updated monitor driver for XP. I have just installed the GeForce4 Ti4600 graphics card. When the 3DMark2001SE demo is played with default settings, the display runs till the end but when benchmarking the card in high-end settings, the monitor suspends video and

the PC hangs, then reboots after 2-3 minutes. This also happens when I play *Flight Simulator 2002* with high-end settings, within 15 minutes of play.

I have even installed the v28.80 drivers by ASUS, but to no avail. Please help.

**Mario**

Via e-mail

**A** There could be several reasons why your GeForce4 card is acting-up. Below are some of the critical settings and parameters that need to be configured to ensure maximum compatibility and stability.

■ Check that you have assigned an 'IRQ to VGA' in your BIOS. Make sure that your GeForce card is not sharing any IRQs with another card (with the exception of the 'IRQ Holder for PCI Steering' device, which will always use the same IRQ as the GeForce). If

the GeForce is sharing an IRQ with a PCI card, try moving the PCI card to another slot (avoid the slot directly adjacent to the AGP slot, as this usually shares an IRQ with the AGP slot). If the GeForce is sharing an IRQ with an ISA card, reconfigure the card to use another IRQ.

■ Try disabling any anti-virus software that you may be running.

■ Try turning the 'Hardware Acceleration' slider in the System Control **Panel's Performance > Graphics** section down one notch.

■ Install the latest version of ASUS drivers from [ftp://ftp.asuscom.de/pub/ASUS-COM/TR...in2KXP\\_2941.exe](ftp://ftp.asuscom.de/pub/ASUS-COM/TR...in2KXP_2941.exe).


■ Change the AGP Aperture in your BIOS to above 16, as setting it below 16 will dis-

able AGP. You can access the BIOS by pressing [Delete] when you get the Power-on Self Test screen during bootup.

■ If you are using a SoundBlaster Live! soundcard, make sure you have reserved IRQ 5 for SoundBlaster 16 emulation in your system's BIOS. Set IRQ 5 to 'Reserved for Legacy (or ISA) Device' in the 'PCI/PNP IRQ Resource Exclusion' section (your BIOS may use different wordings).

■ Provide adequate cooling for your GeForce, AGP chipset and processor.

■ Try disabling Advanced Power Management in the System Control Panel.

■ Try turning up the I/O voltage of the motherboard in the BIOS by a small amount if your BIOS supports it. 



Send your problems to [sos@jasubhai.com](mailto:sos@jasubhai.com) or write to Digit, D-222/2, Om Sagar, MIDC, Nerul-400 706



# tips & tricks

## The Magic in Design

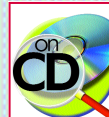
Tips to add efficiency and speed to your day-to-day designing tasks



ILLUSTRATIONS: Mahesh Benkar

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All the software mentioned in Tips and Tricks



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## IMAGE MANAGEMENT AND CATALOGUING

Working with scores of images day in and day out can be a daunting task, but these handy software should help you cope just fine



### Set up a slideshow

If you would rather not have your finger on your keyboard as you browse through a bunch of images, you can use the Slide Show option in Graphic Workshop Pro.

To start the slideshow, select the desired number of images in the browser window and click on the 'View' button (the sunglasses icon). In the drop down list, click on the second item. This pops up the 'Slide Show Options' box, where you can set preferences such as the

duration and background colour. Enable Zoom and the software automatically resizes images that are too large to fit onto your screen.

### Preview with thumbnails

Thumbnails allow you to preview an image before actually opening it.

ThumbPlus 5.01 supports five customisable thumbnail views. You can right-click on the Thumbnail View caption bar and select from among different views such as Small View,

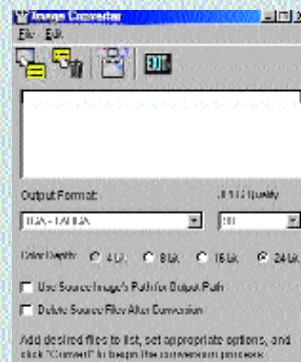
Large View, Custom View, List and Report. You can also go to *Options > Preferences* and change the settings for thumbnails such as how to sort thumbnails, what to display for each file, and the file types to display under Thumbnail View.

### Converting image formats

Converting a JPEG to a GIF would be a tiresome process if you had to do a Save As for each and every file, especially if you're in the habit of working up a storm when downloading images!

In CDH Image Explorer Pro you can easily convert your images to other formats by clicking on the 'Batch Format Converter' button on the toolbar. In the window that pops up, click on the 'Add Files to List' button and select the files that you wish to convert. In 'Output Format', select the format that you want the image converted to and then click 'Convert Images'. Once you're done, click 'Exit' to get back to the main window.

Converting image formats doesn't get any easier than in Graphic Workshop Pro. Simply right-click the image thumbnail and click on 'Convert' in the drop down list. A box pops up with a list of all the formats that you can convert to. Click on any one (say, JPEG),



Converting image formats in CDH Image Explorer Pro

choose the location that you would like to save the file at in the next box and, voila, you're done!

ThumbsPlus 5.01 lets you convert image formats just as easily. You can either right-click on the thumbnail and click on *Quick Processes > Convert To* and then select the desired format, or click on the 'Image' menu and then on 'Quick Convert' and pick from the list of formats available.

### Renaming files

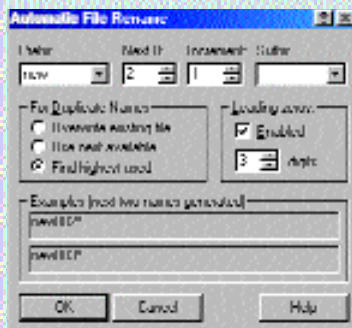
Sometimes you might want to save two or more images by the same name but with a different suffix and number to keep them from being overwritten. But keying in 'backbyte001', 'back-byte001a'..., for over five to 10 image files is, to say the least, undesirable!

In ThumbsPlus, select the files you wish to rename and click 'Auto



Browse through your image collection as thumbnails in ThumbsPlus





Renaming files in ThumbsPlus 5.01

Rename' in the File menu. In the 'Automatic File Rename' box type in the new filename in the 'Prefix' box, a number in the 'Next#' box, and a suffix in the similarly named box. Select the number of digits you would like in the name (e.g. back-byte001a). You can see an example of the filename as you make the selections in each box. Click 'OK' and you're done.

Au2Thumbs Pro also makes file renaming, individually or in batches, a breeze. Click on the 'Advanced File Renamer' button on the toolbar, and in the window that pops up choose the files that you wish to rename, either by double-clicking the filename or by selecting the file and clicking on the 'Add Files'

button. Now, click on the 'Rename Options' button and in the 'Renaming Selections' box choose from among options such as 'Replace Extension', 'Shorten File Name', 'Replace File Suffix', 'Replace File Prefix', etc. Click the 'Rename' button and your task is complete.

### ✚ Making a Favourites folder for your images

If you work with images on a regular basis then it's only common sense that you would want to save the images in separate folders. However, jumping from one folder to another when you want to move and transfer images is a downside that you can remedy by creating a Favourites folder.

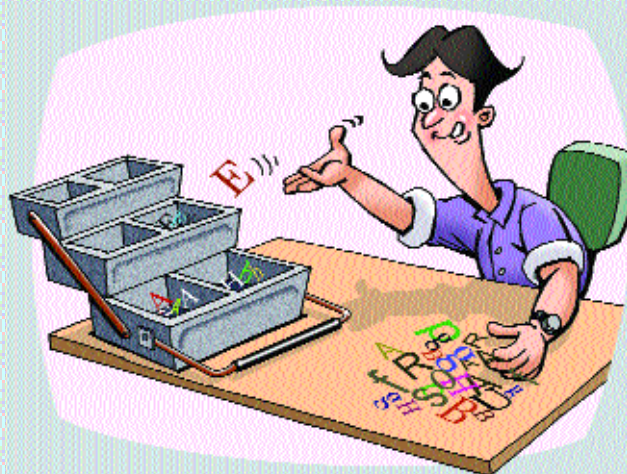
In ThumbsPlus, go to 'Add to Favourites' in the Tree menu and in the Path field enter the name and path of the folder that you would like to set as Favourite. Type in a description and click 'Add'. Once this is done you can jump to your Favourites folder by clicking on 'Go To' in the Tree menu and selecting the folder name you had entered before.

## Shortcuts in ThumbsPlus 5.01

Start Slide Show	[F8]
Add to Favourites	[Ctrl] + [R]
Edit Favourites	[Ctrl] + [Shift] + [R]
Show File Name	[Ctrl] + [Shift] + [2]
Display Small View	[Ctrl] + [1]
Display Large View	[Ctrl] + [2]
Display Custom View	[Ctrl] + [3]

## FONT MANAGEMENT TOOLS

Font management tools help you keep track of, browse, and install fonts on your PC



### ✚ Cataloguing fonts

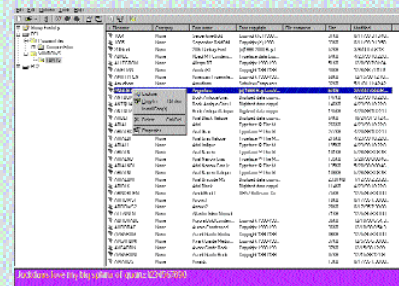
It can be quite tiresome to keep track of all fonts on different CDs. Advanced Font Catalog maintains the list for you.

Adding a new drive that you want to catalogue is pretty easy with Advanced Font Catalog. Go to 'Edit' and click on 'Add Volume' or just press the [Insert] key. This will bring up the 'Add New Volume to Catalog' dialog box. Select the drive you want to catalogue. Click 'OK' and the drive will be scanned to catalogue the fonts on it.

### ✚ Installing fonts

Let's take a look at how you can install fonts, individually or in a batch, from the font catalogue you just created.

Browse the catalogue, select the fonts you want to install, right-click and select 'Install Font(s)' in the menu.



Right-click to install the font in Advanced Font Catalog

### ✚ Swapping text and background colour

Having the right colour combination is imperative when searching for that perfect font.

Advanced Font Viewer allows you to swap the text and background colours. From 'Options' click on the 'Text' box to select a colour



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for the text and the 'Background' box to change the background colour. Now click on the 'Swap' button and click 'OK'. This will swap the colours.

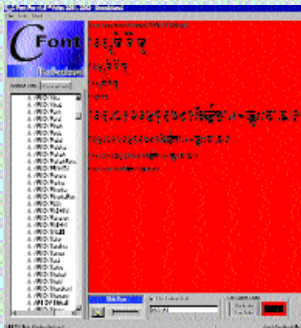
Similarly, in **Advanced Font Catalog**, click on the 'Preview Text' box at the bottom. From the drop down list you can change the text and background colour by clicking on 'Text Colour' or 'Background Colour' and selecting a new colour.

To change the text and background colour in **CFont Pro**, click on the 'Foreground Colour' button or the 'Background' button under 'Set Custom Colours' in the toolbar at the bottom. Once you've selected the colours, click on a font and the text is displayed in the new colour combination.

### 2 ■ Setting up a slideshow

Why scroll through the huge list of fonts on your hard disk when you can sit back and view them in a slideshow?

**CFont Pro** has an Auto View Mode, which lets you view all installed fonts on your system in a slideshow. To start the slideshow, click on the 'Toggle Auto View Mode On/Off' button. The



Fonts slideshow in CFont Pro

installed fonts are displayed with sample text. To stop, just hit the [space bar]. You can increase or decrease the speed of the slide show using the slider near the 'Auto View Mode' button.

### ■ Installing fonts for present Windows session

Installing a lot of fonts on your hard disk takes up space and makes your drive run a lot slower. And installing a font on your hard disk if you just want to use it once is not worth it.

If you need to use a font temporarily off a CD-ROM, click on the 'Preview Fonts' tab in **CFont Pro**. Browse for the font you need, go to **Tools > Install** and select 'Current Windows Session'. This will install the font just for the present Windows session.

## Shortcuts in Advanced Font Catalog

Add new disk to catalogue	[Insert]
Get information about a catalogue	[Ctrl] + [I]
Finding a particular file or folder on a disk	[Ctrl] + [F]
To view favourite files	[Ctrl] + [Enter]
Creates a new font catalogue	[Ctrl] + [N]
Opens an existing font catalogue	[Ctrl] + [O]

## IMAGE COMPRESSION UTILITIES

Small-sized images take up less disk space and enable faster loading of Web pages. But finding the right balance between size and quality is difficult



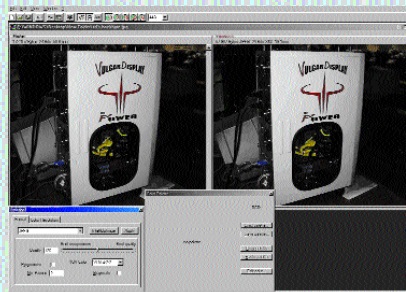
### ■ Compressing an image

**JPEG Imager** starts the compression process by default the minute you open a file. You can disable the automatic compression feature by clicking on the 'Auto' button on the toolbar. To manually compress images, open an image and click on the green 'Compress the image' button.

When you open an image

in **Web Graphics Optimiser Professional**, the software shows you the original image as well as the compressed output. As per your preference, you can open up to five variations of the image by clicking on the 'Display Variation' buttons on the toolbar, and manually compress each one further. Click on one of the variation images and further

compress the file using the Quality slider in the box below. You can drag the slider to choose between 'Best Compression', which gives you maximum compression but at a loss of image quality, and 'Best Quality', which gives you good quality but



Compressing files using the image quality slider in **Web Graphics Optimiser Pro**



poor file size compression. Check the Greyscale box if you want the image in black and white and click on 'Apply' to make the changes.

For single file compressions in **Advanced GIF Optimiser**, click on the 'Manual' button on the toolbar. This pops open the 'Manual GIF Optimiser' window. Here, click on the 'Open GIF' button to open a GIF image. Click the 'Test' button to check the difference in file size before and after compression. Click the 'Optimise' button and click 'Yes' in the 'Confirm' dialog box.

To compress images in **JPEG Wizard**, open an image file and on the slider bar below the image, adjust the slider between 'Better Quality' and 'Better Compression'.

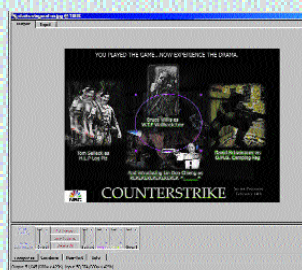
#### **Selective compression**

Selective compression allows you to select specific parts of an image and compress them to a different extent than the rest of the image. This feature can be used to further decrease a file size by lowering the quality of insignificant portions of an image.

In **JPEG Imager**, you can selectively compress portions of an image by first clicking

the 'Selective Compression Mode' button on the right hand side tool bar. This activates the 'Extra' slider panel at the bottom. Select an area on the image and drag the 'Extra' slider as desired. The area selected is shown in blue. The more saturated it is, the more it will be compressed and the lower its quality will be.

Conversely, in **JPEG Wizard** you can select certain areas of the image for compression optimisation. This means that you can select a particular area of the image



*Adding a region for compression in JPEG Wizard*

that will retain high quality while the rest of the image loses quality. Open an image and click on the 'Add Region' button. Select the region shape (rectangular, ellipse, or freeform) and click 'OK'. You can move or resize the region that appears on the image. Move the 'Background' slider to reduce the quality of the parts not included in the box.

#### **Batch compression**

Compressing images for the Web is best done in batches, especially if you're working with a large number of images.

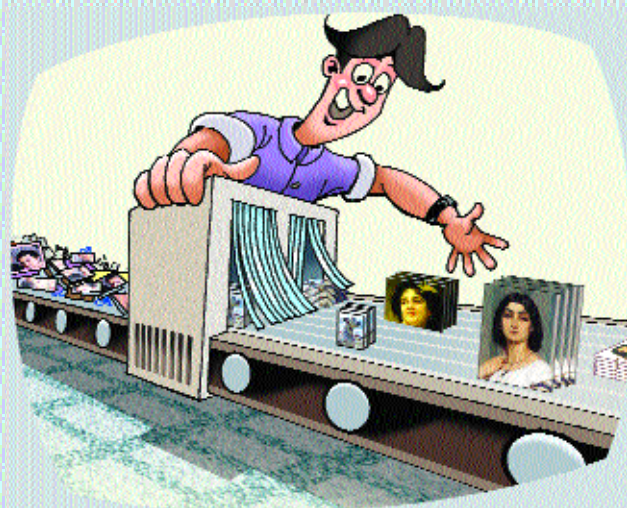
To batch compress images in **Advanced GIF Optimiser**,

click on the 'Batch' button on the toolbar to launch the batch converter window. Here, browse to the required folder and click on 'Add All' to add all the files in the folder. To choose the directory where the images will be saved, click on the 'Output Directory' icon. By clicking on the 'Options' button you can set preferences for compression (RLE or LZW), type of diffusion and colour palette. Next, click on the 'Start' button and the files will be compressed.

In **WebGraphics Optimiser Professional**, click on 'Batch Intelligent Optimisation' under the File menu and select the files that you need batch processed by clicking 'Add Images' and browse for the required files. You can choose whether to always save images in GIF or JPEG formats. Next, click 'Start Batch Optimisation' and the 'Batch Optimisation' dialog box will indicate the status of the files being compressed.

## **BATCH PROCESSING**

**Batch processing can considerably speed up mundane tasks such as image resizing and file conversions**



#### **Resizing images**

In **ImageSizer**, select the files you wish to resize and click 'Preferences' in the File menu. In 'ImageSizer Preferences', you can set the width and height of the images. To create thumbnails, select the 'Create Thumbnail' box and

provide the thumbnail width and height. You can set the image quality by dragging the Image Quality slider (0 indicates low quality and small file size while 100 indicates high quality and large file size). To add a text overlay, click on the 'Text Overlay' tab

## **Shortcuts in Advanced GIF Optimiser**

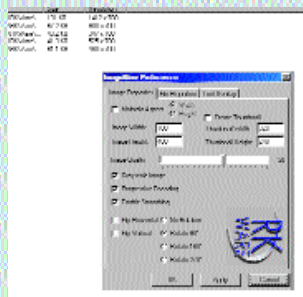
Batch Conversion	[F3]
Manual GIF Optimiser	[F2]
Image Viewer	[F4]
GIF Explorer	[F6]
Test	[F9]



Job Search, Resume Builder, Salary Centre, Job Alerts

TechJobs

[www.zdnetindia.com/techjobs](http://www.zdnetindia.com/techjobs)



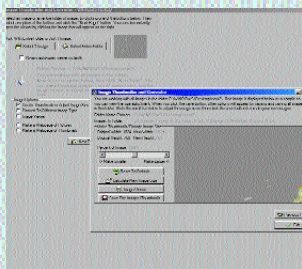
Setting preferences for resizing images in ImageSizer

and type in the desired text in the 'Overlay Text' field. You can also select the position of the text on the image and the font and background colour. Next, select the output folder by clicking on the 'File Properties' tab and click 'OK'. Now click on the 'Process all images' button on the toolbar and your images will be automatically resized and saved.

**Mihov Image Resizer** lets you resize JPEG, GIF, and BMP images. Select the folder that has the images in the left pane. Depending on what files you wish to resize (JPEG, GIF or BMP), click on the appropriate tab in the right pane. For JPGs the software lets you decide on the quality of the image after resizing by dragging a slider. Another slider allows you to choose between Normal Quality and Better Quality, but if you choose Better Quality the resizing process is slower. You can also change the size by entering your preference in the Pixels field. Click on the 'Resize' button and the images are resized and saved in the same folder with a prefix

'mini-' added to the original file name.

When working in **Image Thumbnailer and Converter**, click on the 'Select Entire Folder' button to work with multiple files. When you click on any one file in the folder, the software selects the entire folder for resizing. Select 'Create Thumbnails or Adjust Image Size', and then click on the 'Next Page' button. On the next screen, you can make the image larger or smaller through the 'Percent of Image' slider bar. Next, click on the 'Calculate new image size' button and the



Adjusting image size in Image Thumbnailer and Converter

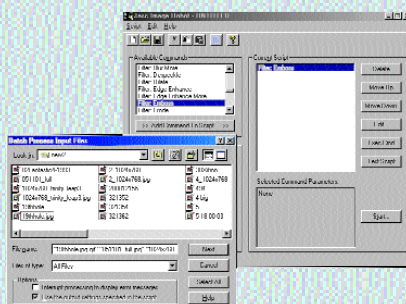
software calculates the current size of the images under each format. To complete the process, click on the 'Save the images/thumbnails' button. In the window that pops up, select whether you want to convert all the images in the folder or a particular format and click 'OK'. Choose the format that you would like to save the images in and click 'OK' again. For JPEG images you can set the level of compression. Click on 'OK' and the files will be resized and saved in your default folder.

In **PicSwitcher 1.0**, select the folder that contains your images in the 'Select Image Source' field. The software displays all the filenames in the 'Select Picture Files' pane on the left. You can select individual files or the entire lot by clicking on the 'Select All' button. Click on the 'Image Conversion' tab and select from the 'Window View' field whether you would like to view the image as a thumbnail or as the transformed image. You can change the horizontal and vertical size from the 'Resize' field. You can also change the format of the image from the 'Output Format' field. The 'Options' button lets you set the output quality and compression settings for JPG, PNG, GIF, and TIFF files. Click on the 'Convert' button, select the target folder in the 'Select Image Directory' window, and the files will be resized.

#### Batch application of filters

You can also apply filters to multiple images in one go.

In **Jasc Image Robot**, you can process images in batches using command scripts.



Adding multiple files in Jasc Image Robot

First, select a command from the 'Available Commands' field. For example, if you want to apply the Emboss filter to a batch of files, select 'Filter: Emboss'. Click on the 'Add Command to Script' button. The script will now be displayed in the 'Current Script' area. You can add and delete as many commands as you want from here. For some commands, a popup dialog box allows you to fine tune your preference settings before you add them to the 'Current Script' field. After adding the commands, click on the 'Start' button and select the files that you would like to process in the 'Batch Process Input Files' window. Click 'Next', select the output folder and click 'Finish'. The filters will be automatically applied to the files and saved in the target directory.

To apply filters in **Advanced Batch Converter**, click on the 'Batch Mode' button in the toolbar. Select the files you would like to apply the filters to. Select 'Use Advanced Options' and click 'Options'. In the 'Advanced Options' window, click on the 'Filters/Distort/Morphing' tab. Here, select the filters that you would like to apply. You can also set your preferences for Distort, Wave and Morphing filters in the appropriate fields, then click OK. Back in the



'Batch Mode' window, add the selected files by clicking on the 'Add All' button on the right. Select the format that you would like the output to be in, click Start. And voila! Your task is done!

## Manipulating images

Making changes in images, such as increasing or decreasing the brightness, saturation, contrast, colour, or even adding captions, is a breeze when done with batch conversion software.

To manipulate images in **Batch It!** click on the 'Settings' tab in the main window. In the 'Image

ground colour' by clicking on the 'Font' and 'Background' buttons. Select the way you want the text to be aligned from the Alignment field. Click on the 'Control Centre' tab and click the 'Process All' button to start the processing.

To manipulate images in **Advanced Batch Converter**, click on the 'Batch Mode' button. Select the files you wish to process and click 'Add All'. Select the 'Use Advanced Options' box and click 'Options'. Click on the 'Colour Effects' tab and make your selection for Negative or Greyscale.

Adjust the Brightness and Contrast properties as per your choice.

You can also change the colour format by selecting the 'Change Colour depth' box and choosing between the

different colour formats (256, 16, 2 colours). You can also change the RGB count and swap colours (RGB to BRG, etc) by selecting the 'Swap Colours' box. You can add customised text to the images by clicking on the 'Crop/Flip/Mirror/Rotate/Text' tab. Select the 'Add Text' box and type in the text in the field below. Once you've selected the text, background colour and alignment, click 'OK'. Click 'Start' and you're done.

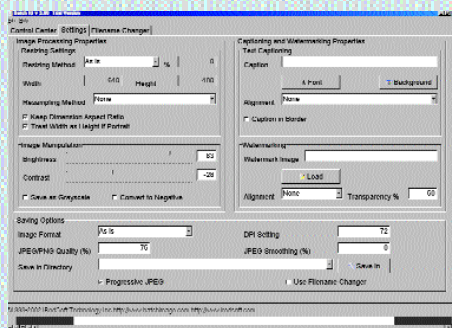


Image manipulation settings in Batch It!

Manipulation' field drag the 'Brightness and Contrast' sliders to increase or decrease the two properties. You can also select the 'Save as Greyscale' and 'Convert to Negative' check boxes if you want the images to be saved in black and white or as a negative. If you wish to add a text caption to the images, type in the desired text in the 'Text Captioning' field. You can also select the font, text colour and the back-

## MISCELLANEOUS

Here are some varied tips that you designers might find useful



## Screen capture

**HyperSnap-DX 4.5** is quite a handy tool when it comes to taking screenshots as it allows you to capture and edit a full monitor screen, capture an image of a working window, or a selected area on the screen. Here's a closer look at this software.

**Window capture mode:** To capture a screenshot of an open window on your monitor, keep the HyperSnap-DX main window as the active window. Click on 'Window or Control' in the Capture menu. A blinking frame appears around the window and you can move it around to envelope the entire window. Click the left mouse button or hit [Enter] and the captured image will be pasted onto the software's clipboard for you to edit.

**Multi-region capture:** You can use this feature to cap-

ture screenshots of cascading menus. Open a multi-level menu (such as the one you get when you right-click on an icon) and click on 'Multi-Region Capture' under the 'Capture' menu or press [Ctrl] + [Shift] + [M]. A blinking box appears and you can move it around and click on each menu to make multiple selections. Once you've selected all the menus, press [Enter] and the screenshot is ready.

## Colour tools

Any digital artist knows the heartache involved in getting that right shade of colour. But with these tools you can hit the bull's eye as they give you accurate colour code values.

To start with one of the easiest of colour tools, **3C** lets you pick any colour off your screen! Simply click on



Buyers Guide, Indian Vendors, Tutorials, Install Guide, Platforms, Maintenance Tips

ServerZone

[www.zdnetindia.com/server](http://www.zdnetindia.com/server)

the 'Screen colour' button, move the cursor to any part of your screen and click the underlying colour displayed in the software's preview box. You can also see the RGB and Hexadecimal values for that colour. You can manually change the RGB values of the selected colour by dragging the sliding panels for the RGB colours.

**Super Color Picker** is another easy-to-use tool. Simply click on the 'Start' button or hit [F5] and move the cursor over your screen to a colour. That part of the screen will be displayed in the preview panel. The software displays the RGB and HSL values



of the colour as well colour codes for use in HTML, DELPHI, C++ and VB. (The unregistered version does not support all these features).

Colour codes in Super Color Picker

of the colour as well colour codes for use in HTML, DELPHI, C++ and VB. (The unregistered version does not support all these features).

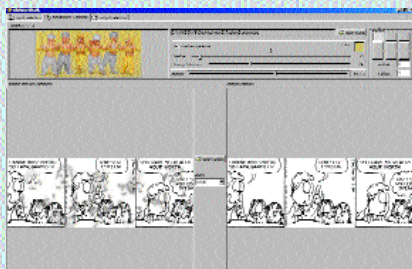
### Watermarking

Don't you wish you could mark your digital art the same way that Monet marked his? Well, now you can!

Adding a watermark to

copyright an image is quite easy using **Picture Shark 1.0**. Launch the software and begin by clicking on the 'Input Selection' tab. Here, browse to the folder that contains the files you need marked. Select these files and click on the 'Add Sel' button. You can also choose to add all the files in the folder by clicking on the 'Add All' button. Once added, the files will be displayed in the Selected Files pane.

Now, click on the 'Positioning+Settings' tab. Here, select an image to use as a stamp by clicking 'Open Stamp'. You can adjust the transparency with the help of the 'Feather' and 'Transparency Tolerance' slider



The 'Positioning+Settings' Window in Picture Shark 1.0

bars, and view the difference in the 'Preview' pane. Use the Position field in the top far right corner to choose the position on the image where you would like the stamp to be placed.

Click on the 'Output Selection' tab and select the target folder where the images will be saved. In the 'Output Settings' field on the right, select the Output Format that you would like

the files to be saved in and click 'Start'. You should have your copyrighted images in no time!

### Image enhancement

You're just back from the photo studio having picked up some photographs that you had taken of yourself in that dapper new suit. But you find yourself staring at someone with a red eyeball who looks more like Lucifer! Here's where image enhancement software come in to correct errors such as the red eye effect or to just fool around with images.

**Red Eye 1.2** comes in handy in those unfortunate scenarios where a perfectly good photograph is ruined by the red eye effect. It helps you get rid of red eyes in your pictures in the simplest way possible—open an image that has a red eye error, place the mouse pointer at one corner of the red eye, click and drag over the region to select it and release the mouse button. The red component is reduced automatically!

**PhotoFantasy 2.0 LE** is not a serious software—it's all fun! This isn't the right software if you intend to do some image enhancement but if you want to send your friend a picture of the two of you on the cover of a wrestling magazine, then this software can do it for you. The software has a



Adding images to a template in PhotoFantasy LE

number of readymade templates that you can select by clicking on the 'Get Fantasy' button. In the popup window, select a template from among the list available (e.g. Wrestlers, Surfer Girl, etc). The templates that you select have a particular section where you can embed an image of your own. To embed an image, either double-click on the region or click on the 'Get Photo' button. Browse for the image you want and click 'OK'. You can select up to three images depending on the template.

Once the image is placed in the template, you can manipulate it to make it look as realistic as possible. You can flip the image by clicking on the top most button on the right, or even increase or decrease the size of the image to fit the region. You can add your own text to the template by clicking on the text tool. You can also change the brightness, contrast and RGB values through the sliding panels at the bottom. Once you have the desired effect you can either save, print or e-mail your creation.



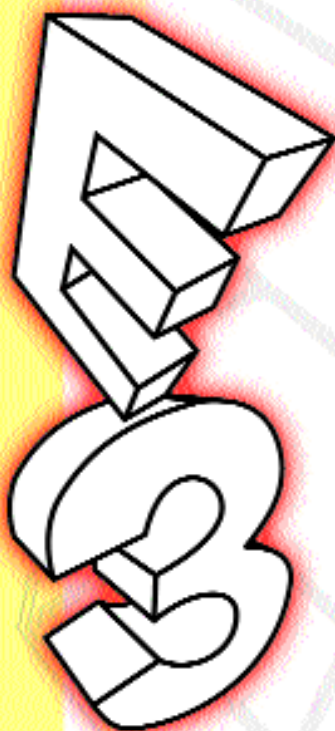
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**ISP Finder**

[www.zdnetindia.com/isp](http://www.zdnetindia.com/isp)





*The Sims Online* will let you do all the crazy stuff you've been doing with *The Sims*—online, with just about anybody in the world. A fully online version of the all-time best-selling computer game should open up some intriguing scenarios. It has all the standard features of the original game such as charisma building, cementing positive or negative relationships with other Sims, along with new features such as instant messaging.



Maxis is also poised to release a progression of the *SimCity* series this year, *SimCity 4*. The sequel's improved God mode will let you control the natural disasters such as fires, erupting volcanoes and whirlwinds that hit your city.



## A look at all the hype and talk behind the biggest games at E3

The Electronic Entertainment Expo (E3) is where you get to witness the latest groundbreaking technologies for computers and video game consoles. Held at Los Angeles, the eighth E3 drew in a crowd of 60,000 game industry professionals—

from the most influential, to the most diehard fan boys. Last year, the trinity of the Xbox, the GameCube, and the PlayStation 2 outnumbered the PC stalls. However this year, PC games shone bright with innovations in technology and design.

## America's Army: Operations

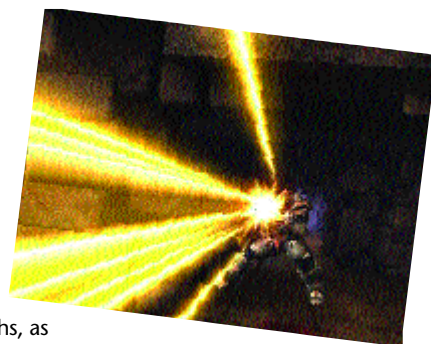
*America's Army: Operations* looks like yet another realism based, online, teamplay, and first-person shooter like *Ghost Recon* or *Counter-Strike*. Except for two things: the US Army is developing it and it's going to be completely free! Created with the latest *Unreal Warfare* technology, the game will try to recreate the Army experience. It allows up to three players and will contain about 20 levels set in various locations around the world in its initial release. The US Army is planning on releasing the game free of cost later this year, via the Internet and magazine cover-mount CDs.



## Unreal Games

Long, long time ago, way back in 1999, *Unreal Tournament* revolutionised the FPS genre with solid graphics, networking, and multiple game-play modes.

The year 2002 will be a crucial one for Epic games, with the anticipated release of *Unreal II*, the single player sequel to the original *Unreal* game. *Unreal II* is being developed by Legend Entertainment and is scheduled for release towards the second half of the year. *Unreal Tournament 2003*, the sequel to *Unreal Tournament*, is in the making by Digital Extremes and will be available in the next couple of months, as will *Unreal Championship*, an upcoming action game set in the Unreal universe for the Xbox game console.



# ATTACK OF THE SEQUELS

Successors to popular franchises were announced at the E3, so expect a glut of sequels in the coming year:

## Max Payne 2

Take-Two Interactive announced that the development of *Max Payne 2* has begun, and that Rockstar and Remedy will be designing the title.

## No One Lives Forever 2

One of the finest first-person shooters since *Half-Life*, *No One Lives Forever* succeeded at being original, inventive and fun. Expectations are high for the sequel, which looks terrific and sports all of the various enhancements of the LithTech 3.0 3D engine.

## Counter-Strike: Condition Zero

A stand-alone product, *Counter-Strike: Condition Zero* includes an upgraded version of the multiplayer title, as well as six story-driven episodes, three single player modes and various multiplayer enhancements.

## Deus Ex 2003

Ion Storm moves forward with its dark, conspiracy-laden view of the Earth's future with this sequel to *Deus Ex*. The story and tweaks to gameplay will give players a feeling of the familiar, but with improved graphics and AI.

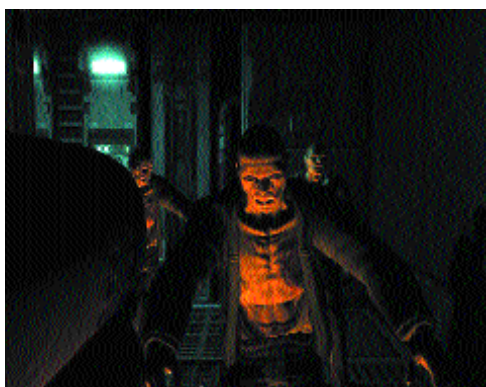


## Star Trek: Elite Force 2

*Star Trek: Elite Force* is currently under development by Ritual and uses an enhanced version of the *Quake III* engine. You'll once again fill the boots of Alex Munro, a member of Voyager's Special Ops team, and even hop aboard the Enterprise along the way!

# DOOM III

There's no question that id Software's highly anticipated shooter was the show-stopper and the most talked about game at E3. *DOOM III* is unbelievably detailed, and the engine's use of real-time lighting and shadows is miles ahead of any other



game created so far. The game will support Dolby 5.1 surround sound, and background music from Trent Reznor of Nine Inch Nails. Judging from the leaked videos doing the rounds on the Net, it's quite clear that *DOOM III* delivers its promises. The potential impact of id Software's new technology on future games makes *DOOM III* the top game of the show.

# Battlefield: 1942

*Battlefield: 1942* is an action game that places you in the middle of World War II, in levels set across four locations—the Pacific, Western Europe, Eastern Europe and North Africa. For most of the levels, the game features a Conquest mode in which you need to control flag points around the map for as long as possible. Apart from single player and multiplayer missions, you get to play the Capture the Flag, Death-match and Co-operative modes.



But the winning feature of the game is the nearly 40 controllable vehicles at your disposal. You will be able to run around with machine guns, bazookas and sniper rifles, but you can also hop into a jeep, a tank, a plane or even a submarine. Instead of taking a rigid simulation-style approach, *Battlefield's* vehicle physics are pretty easy and forgiving, letting you spend more time dog-fighting than wrestling with the controls. The team has been doing a lot of balancing, making sure that no one vehicle or weapon or tactic will be too difficult to play with.

# Matrix game

Amid the full fury of the E3, Warner Bros and EON Entertainment announced that they are in mid-production of a game based on *The Matrix*. It's being developed with the full support of EON, Warner Bros, LithTech and the Wachowski brothers. The new game will play out in a massively multiplayer online environment that recreates the world of *The Matrix*.

SRIRAM SHARMA







# SOLDIER OF FORTUNE

## DOUBLE II HELIX

The ultra violent tactical shooter from Raven is back!

A new and insidious threat has risen in the form of a bio-terrorist organisation and their two-pronged Gemini Virus. You take control as John Mullins, weapons specialist, anti-terrorist mercenary and military consultant, off on a transcontinental mission to stop the terrorists and destroy the virus before it's unleashed on humanity. Raven has done a fantastic job of utilising the *Quake III Arena* engine and GHOUL II technology for ultra realistic

damage modelling. With 36 damage zones and 16 dismemberment zones, you're assured of intense, action-packed, bowel-turning, graphic violence!

### Camouflage your intentions

The tactical advantage or disadvantage you gain from the lush vegetation adds a new dimension to the game. Mullins can use camouflage techniques to merge into the surroundings. You stay in a concealed position with your sniper scope to the eye, lining up that perfect head shot, then put the enemy down with a gentle squeeze on the trigger.

### Be wary

But be wary of the AI of the enemies—they'll surprise you with their tactics and survival instincts. Enemies will duck around corners and reload their weapons.

If you shoot a gun out of an enemy's hands, he won't just run away. He'll go looking for another weapon and come back to get you. If you rely heavily on sniping, the enemy soldiers will wise up to it and try to move in closer for the kill, while effectively using the terrain and advanced criss-cross movement techniques.

### Slow and stealthy

There are several stealth missions in the game; most of them will prove to be frustrating if you don't use stealth tactics. Sneak up behind the guards and hit them with the pistol using secondary fire. But don't merely knock them unconscious, because they'll wake up. Instead, finish them off with the rifle butt, pistol whip or knife. When you see the pool of blood, you know they're dead and won't

be setting off any alarms anymore. Also, try walking instead of running, or disable 'Always Run'. The enemy AI can hear you if you're noisy and you're quieter while walking or crawling.



*Use foliage to your advantage to creep up on enemies and give them a hot lead injection!*

### Want more gameplay?

Okay, so you've blasted your way through all 55 levels and want something more. There is an in-game mission generator that allows you to customise your own levels of play. You can choose the mission type, location, time of day, difficulty and time limit. And *SOFII* features great multiplayer action with various modes like Deathmatch, Team Deathmatch, Capture the Flag, Elimination and Infiltration. ■

SIRIRAM SHARMA

### Tweaks for Maximising Single Player Performance

*SOFII* is a system hog—you need at least a 16 MB video card to run it. Bring down the console and type `cg_drawFPS 1` to view the frame rates. You need at least a frame rate of 30 to 40 fps to play it decently. If you find your system lagging, try the following:

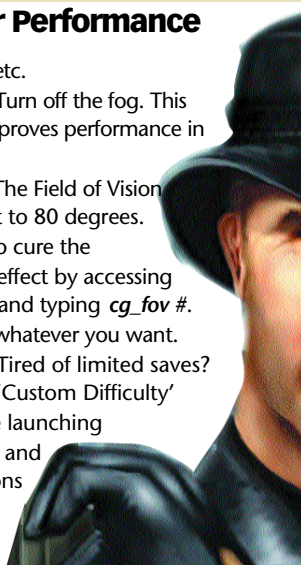
- Run Scandisk and Disk Defragmenter utilities to optimise your hard drive. Make sure you have a large page/swap file available for the game to use.
- Play the game at a resolution of 640x480. Cranking the game up higher than 800x600 will make for huge performance slowdowns and extremely long load times.
- Set sound sample quality to low if you have an onboard or built-in soundcard.
- Disable Decals, like bullet holes,

blast marks, etc.

Turn off the fog. This drastically improves performance in some areas.

The Field of Vision of *SOFII* is set to 80 degrees. Set it to 90 to cure the 'zoomed in' effect by accessing the console, and typing `cg_fov #`. Set the # to whatever you want.

Tired of limited saves? Go into the 'Custom Difficulty' menu before launching a new game and set the options to your liking.



### Cheats Galore

You can bring down the console in *SOFII* by pressing and holding the [SHIFT] key and then pressing the tilde [~] key. Type `sv_cheats 1` (it is case sensitive) and press [Enter]. The cheat codes are essentially the same as in *Quake III: Arena*. The main ones are:

- God Mode: `god`
- Noclip Mode: `noclip`
- Get all weapons: `give all`
- Enemies can't see you: `notarget`
- Speed up or slow down the game: `timescale x`
- Warp directly to a map: `map <mapname>`



Spin a web, shoot a goal, take on some devious terrorists, or just read a book

## PRO SOCCER CUP 2002

Ole!

Cashing in on the craze of the World Cup comes a title, which gloriously avoids all copyrights and franchises by misspelling names! *Pro Soccer Cup 2002* is the poor man's *FIFA 2002*.

When it comes to football, the *FIFA* pedigree of games is by far the greatest football simulation conceived. Sports games may have taken their time in evolving, but with each passing year, they've gotten increasingly complex and feature rich. You can record in-game videos and save them to an AVI file, or even take screenshots of that perfect overhead kick.

When compared to a franchise like *FIFA 2002*, *Pro Soccer Cup 2002* is a poor competitor. The game has limited production values, no big names endorsing it and it comes from an unknown developer whose Web page says 'PAGE UNDER CONSTRUCTION'! So there obviously was a lot to be skeptical of.

But surprisingly, it turned out to be a well-balanced game, which performed flawlessly in its limited scope of features. The gameplay was simple and engaging, and the passing system worked very well. The controls weren't too difficult and took only about 5 minutes to adapt to. Okay, the AI is a little weak and the gameplay



VIEW FROM THE TV BOX: Choose from eight camera views, including a third person view and a top down view

tactics lack variety, but it's still enjoyable. The game gets tougher by simply speeding up the reaction times. The difficulty level of the opponent depends on the team you are playing against. Each team has a skill percentile (Saudi Arabia had 40 per cent and Brazil had 100 per cent). In a 10-minute match, Brazil scored three goals against us, while we managed to beat Saudi Arabia 5-2, while playing as Argentina!

The graphics rates above average, with weather effects, instant replay, and eight camera modes. The stadiums were

decently rendered, and the players look realistic while tackling and dribbling the ball. The character animation surprises with its details—players would make victory dances when they scored a goal, while the goalie would kick his heels in frustration. The sound however, is quite poor; and there's no in-game commentary, just a rasping crowd chant that gets louder every time a player comes close to a goal. The rain

effects sound like the recording of a shower played over and over in an endless loop!

The multiplayer feature for a LAN game is the added bonus. All in all, the good outweighs the bad in this game.

**Genre:** Sports

**Developer:** Enigma

**Distributor:** World Wide CD ROMS

**Phone:** 022-6973894

**Web site:** [www.enigmasp.com](http://www.enigmasp.com)

**Price:** Rs 699

**Rating:** ★★☆☆☆

## SOLDIER OF FORTUNE II: DOUBLE HELIX

Gore galore

*Soldier of Fortune II (SOFII)* is a great game if you have never played a First Person Shooter (FPS) before. However, if you have played an FPS before, you'll tire of all the FPS clichés in this game. But if you can look past the scripted levels and poor implementation of stealth, this game shines at what made the original *SOF*

successful—gun gameplay. The story revolves around a group of terrorists who develop a virus to release at the World Trade Summit in Switzerland and demand a huge ransom in return for the cure. You play as John Mullins, weapons specialist and military consultant, sent to uncover and foil their dastardly plan.

Though the game brags about its gore and damage locations, it would be just as good without the horror, and you can turn it off. Shooting people in different places with different weapons can be very disturbing. Hands, feet, shins, legs, spew out in bloody chunks—definitely not for those with a weak stomach!



The AI is above par. Enemies are smart and know exactly where to throw grenades and how long to hold them before they throw them at you. They will perform different tactics to try and nab you and each encounter is different from the next in some way.

*SOFII* uses a modified version of the *Quake III* engine with a GHOUL system (body specific damage and gore modifier), which makes the character detail quite awesome, if you have the hardware for it. The environments looked wonderfully detailed and textured. While a majority of the levels feel like you are in a giant warehouse, there is plenty of eye candy in the forest levels where

the trees add a new level of detail to the tactical aspect of this game.



The random mission generator is not spectacular, though it can create an endless series of single player fun. There are various game styles: Multiplayer, Infiltration, Capture the Flag, Deathmatch, and Team Deathmatch. From a multiplayer point of view, this game is a winner. Given the number of features this game offers and its numerous gameplay modes, it's a good value-for-money buy.

**Genre:** First Person Shooter

**Developer:** Raven Software

**Distributor:** Milestone Interactive

**Phone:** 022-8381614

**Web site:** [www.activision.com](http://www.activision.com)

**Price:** Rs 999

**Rating:** ★★☆☆☆

## SPIDER-MAN: THE MOVIE

### Spider on your PC

Fresh from the release of *Spider-Man: The Movie*, comes an action adventure game of the same name. The game has been released on all gaming platforms simultaneously by Activision, including the PC, which plays just like the console version.

The storyline is identical to the movie, with a series of excellent full motion CG videos that carry the plot forward. The game drops you right into a tutorial after Peter Parker has discovered his abilities. In the training level, you learn that Spidey can crawl on any surface, catapult across the skyline, and zip across a room with his web. The story starts out with Spider-Man being framed by an imposter and your goal is to clear your name, whilst fighting off

the bad guys and the cops who think you are the bad guy. Your skills will be put to the test across eight locations, spanning 30 levels and you will find yourself slinging from the rooftops trying to rescue hostages in a building that has been taken over by pink blobs.

The fighting system is one of the coolest parts of the game. You can shoot a ball of web at someone, cover yourself with an exploding web dome, or even use your web to pull bad guys towards you for some nice hand-to-hand combat. Being able to unlock new combos and web-slinging over New York remain one of the most thrilling parts of the game.

The game plays similar to a *DOOM* style objective system. While playing indoors, you unlock doors, travel back, grab a fuse from thugs to unlock more doors, go forward. Outdoors, you fly past convincingly rendered skyscrapers that really do seem like they are scraping the sky. Unfortunately, the controls are so maddeningly difficult that it sucks the joy right out of an amazingly colourful and well-textured game. The camera system is not

responsive enough to player movement, and often distracts during crawling and fighting sequences on the ground. Unless you have a gamepad with two-directional buttons, trying to fly Spider-Man around the screen, shoot webs, and control the camera at the same time is an impossible task.

The graphics are fantastic, with hardware T&L (Transform and Lighting) support, smoke, lens flares, and fog effects. The character models, like Venom and Carnage, look really cool. In addition to smoothly animated characters and moves, the explosions and fire effects are also quite effective, lending a real sense of comic-book action. But the eye candy comes at the steep price of a 32 MB 3D accelerator card.

The techno soundtrack and voice acting enhance the whole experience. Notably, the game incorporates voices by the actors involved with the movie including Willem Dafoe and Toby Maguire. *Spider-Man: The Movie* has no multiplayer component, but the power ups and web-slinging fun will ensure plenty of re-playability.

**Genre:** Third Person Action Adventure

**Developer:** Treyarch Invention

**Distributor:** Milestone Interactive

**Phone:** 022-8381614

**Web site:** [www.activision.com](http://www.activision.com)

**Price:** Rs 999

**Rating:** ★★☆☆☆



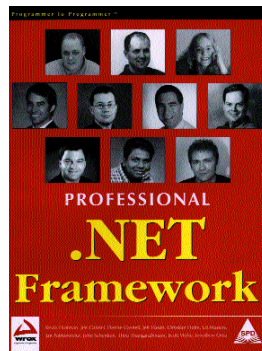
## PROFESSIONAL .NET FRAMEWORK

### Beginner's bet for .NET

*Professional .NET Framework* is a new and fresh book based on the Beta 2 release of the .NET Framework. It demystifies the .NET Framework, telling one what the framework is about, and how and what it can be used for. The book is aimed at intermediate and advanced programmers and hence, some experience with C#, VB.NET, ASP.NET is needed and you need to keep this prerequisite in mind if you plan on buying it.

The book explains in clear and simple terms how you can develop and deploy Web services and other applications based on the .NET Framework and which are the best engineering practices on .NET Framework to adopt. Explanations are relevant and will make your transition to .NET a smoother process.

**Publisher:** Shroff Publishers & Distributors  
**Contact:** Computer Bookshop  
**Phone:** 022-2070989  
**Fax:** 022-2623551  
**E-mail:** orders@cb-india.com  
**Price:** Rs 550  
**Rating:** ★★★★★



## 3DS MAX 4 GROUND RULES

### 3D to the Max

If you think in the world of 3D design and animated landscapes lies your calling, then 3D Studio Max is for you. And to teach you the basics, you have *3ds max 4 Ground Rules*. The book guides you through the features of its latest version, 4.0. Those of us who still use version 3.0 can still get valuable insight into the software through this book. The book features numerous exercises to familiarise you with the tools and features. From the basics, the book moves on to more challenging chapters on Modelling, Cameras and Lighting, Materials, Rendering, Animation, etc. The book includes a CD that contains video files that refer to its tutorials. A perfect package for 3D lovers.

The book explains in clear and simple terms how you can develop and deploy Web services and other applications based on the .NET Framework and which are the best engineering practices on .NET Framework to adopt. Explanations are relevant and will make your transition to .NET a smoother process.

**Publisher:** Thomson Learning  
**Contact:** Computer Bookshop  
**Phone:** 022-2070989  
**Fax:** 022-2623551  
**E-mail:** orders@cb-india.com  
**Price:** Rs 2,157 (approximately)  
**Rating:** ★★★★★



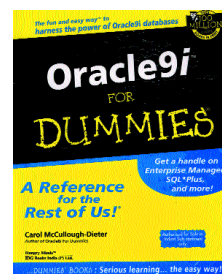
## ORACLE9i FOR DUMMIES

### Oracle simplified

An introduction to Oracle 9i, this book will help you overcome your fear of Oracle. To understand the full functioning of Oracle9i, one has to learn many concepts, bringing together a lot of different technologies. This book addresses a significant subset of the most needed concepts. For those uninitiated in SQL and basic relational concepts, it has a primer on databases and SQL. The book then launches into advanced Oracle management concepts such as Table Spaces, Users and Roles, Security, etc.

This book covers Oracle's Enterprise Manager and briefly touches upon Oracle9i's support for Java and XML, but it is hardly adequate. If you are already familiar with Oracle 8i, ignore this book. The book focuses more on database management as against database programming. Someone interested in becoming a database administrator could start here.

**Publisher:** IDG Books India  
**Contact:** IDG Books India  
**Phone:** 011-3260877  
**Fax:** 011-3275895  
**E-mail:** idgbooks@vsnl.com  
**Price:** Rs 199  
**Rating:** ★★★★★



## BODYWORKS 5.0

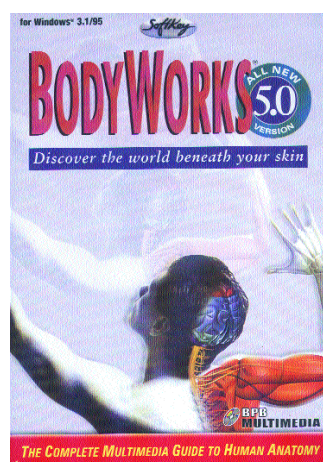
### Getting under the skin

*BodyWorks 5.0* explores the secrets of the human body. The CD has been divided into various sections such as Lessons, Doctor BodyWorks, etc. Among these, Doctor BodyWorks is probably the best section and has been executed as a multimedia presentation to give a comprehensive idea of the subject.

Lessons has views of body parts from different angles and also contains

various options that let you see how the muscles work as QuickTime movies. The medical terms are called out loud, helping you learn the correct pronunciation.

This title is pretty comprehensive if you can stay focused and not get turned off by the bad music and interface. It's recommended to



turn off the music and just keep the sound option on. The interface needs a bit of getting used to, but despite the shortcomings, the CD proves to be a comprehensive guide.

**Developer:** BPB Multimedia  
**Contact:** BPB Multimedia  
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**Price:** Rs 499  
**Rating:** ★★★★★



# SOLD OUT

## Of post birthday celebrations and photo opportunities gone awry

With the closing of our anniversary issue, you would think we could kick back our shoes, and stretch our tired fingers. We thought so too, but we were soon corrected. No sooner had we blinked our tired eyes, the news flooded in...we were all sold out...within days of reaching the newsstands. Our circulation colleagues, Saurabh and Akhilesh were swamped with orders from various distributors for more bulk copies. Phone calls poured in from all the cities asking if we had any copies stacked up. Clients clamoured for their promised copies. The basements of our offices were searched for an orphan copy that may have been left behind. None were found and our personal in-house copies were sent to the rescue.

Now we're always looking for a reason to celebrate, if this wasn't a reason enough, what could be? Our CEO, Maulik commissioned a duo of Musketeers to get cakes and sweets. And go they did, only to return with confectionaries enough for a team of six. Eighty ravenous eyes spotted the goodies from a distance, formed groups and

discussed, discarded and adopted various lines of attack as we assembled in the canteen. Their concentration did not leave the table as our CEO went through his congratulatory speech. Our marketing whiz Louis had the dangerous task of cutting the cake, barely managing to get a lick of the cake stuck to the




ILLUSTRATION: Mahesh Benkar

knife. Most strode towards the cake with stoic determination while others marked pace towards the table with the expertise of chess moves. Still others had managed to strategically place themselves at the table that the cake was placed at. The meek amongst us resorted to making

longing, vulnerable faces in the hope that some kind soul would toss a crumb!

### Keepers of the copy

Meanwhile, e-mails poured in wishing us a happy birthday and congratulating us on the good job done, subtly sneaking in a request for a copy. Readers wondered if we were late. One reader who proudly proclaims to be a 'Digitised Dignitary' wrote in saying, "This month's Anniversary issue is a SMASHING sell-out. It really knocked me off my feet! I was caught unawares because I had this assurance that I would get it even after three days of hitting the stands, despite being prewarned. After 2 hours and seven shops I finally got my hands on the golden Digit." Many even wrote in to ask if we had any copies spare, like this one reader who worded the whole ordeal of his search in a long, long mail, finally saying, "Can you please tell me if you have any copies of June 2002 Digit magazine, so that I can directly buy it from you?" Subscribers offered to pay extra for another copy, while long lost friends traced our team members, refreshed memories and casually asked to borrow the issue.

We woke up from our celebration to realise that we didn't have enough in-house copies of the blue-eyed anniversary baby amongst ourselves. Soon every one on the team was guarding their copies with the eyes of a tigress. Each personal copy was labelled, chaperoned and just fell short of being leashed. The copydesk copy became a coveted issue, with everyone, from marketing to design to the ZDNetIndia team borrowing it for reference. Sveta, our soft spoken features editor, took it upon herself to call out for it every hour or so, booming out, "Who's got the anniversary issue?" Each request for it was met with a stern, "But we want it back. Immediately!" We conspired to put a tracking device on it which would beep when anyone came within inches of it. At night, the copy was snugly put to bed in a locked drawer. 

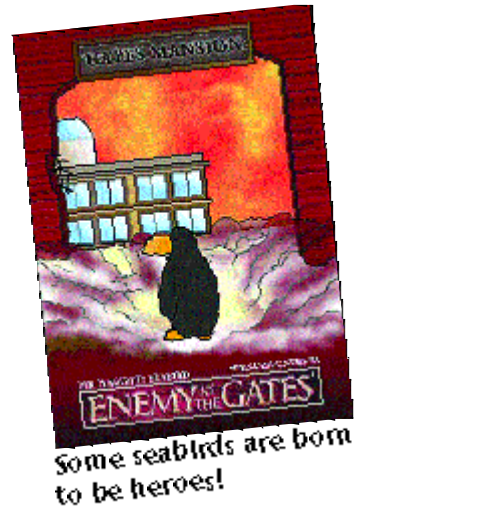
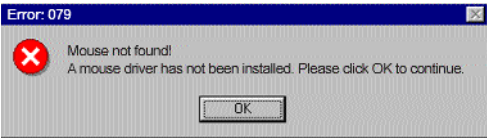
## Behind the Picture

The test scene for the digital camera shootout was made up of various objects like fruits, watches and table-top calendars. Being the industrious types, the folks in the Test Centre went around office demanding (and at times threatening) colleagues for their watches and table calendars. Some even decided to visit the local *sabji mandi* to select the right fruits with the most vibrant colours. The stage was set up in our photo studio, with the lights meticulously placed and adjusted, the fruits, watches and calendars all ready to be shot over the next few days.

But one can only dream of everything going as per plans. The team forgot that fruits, unlike wristwatches and calendars have this nature-induced habit of decaying. So the fresh, juicy fruits chosen for their vibrant colours, turned black before the shoot was over. Tired of waiting, impatient owners claimed back their watches, without telling the team. Calendars found their way to their respective desks, much to the annoyance of the photographers. The scene spoilt, they had to start all over again, assembling things back in place, making the perfect composition as the tight deadlines loomed over their heads. They were all set to shoot again when someone knocked over the lights. Taking in a deep relaxing breath, Jitenbhai (our resident photographer) went out to buy new ones, while his colleague Mexy guarded the photo studio fort, making sure nothing else went missing, rotten or wrong.

But perseverance paid, and in the end the test centre writers had the images they needed.

Idiot-proof!



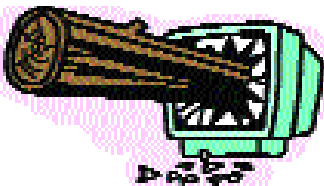
Your chance to bite back!

Highlight the lighter side of computing. Mail your contributions to:  
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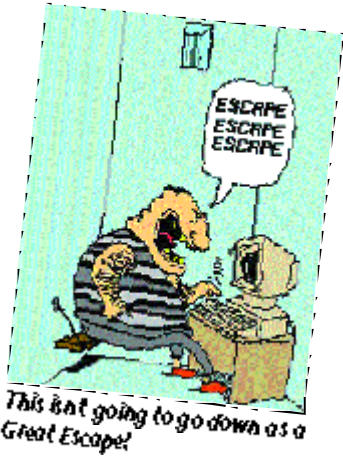
Acting up: Computers in Movies

- Word processors never display a cursor.
- All monitors display inch-high letters.
- High-tech computers, such as those used by NASA, the CIA, or some such government institution, will have easy-to-understand graphical interfaces.
- You can infect a computer with a destructive virus by simply typing 'UPLOAD VIRUS'.
- A hacker can get into the most sensitive computer in the world before intermission and guess the secret password in two tries.
- Any 'PERMISSION DENIED' has an 'OVERRIDE' function.
- Complex calculations and loading of huge amounts of data will be accomplished in under 3 seconds. Movie modems usually appear to transmit data at the speed of 2 GBps.
- If you display a file on the screen and someone deletes the file, it also disappears from the screen.
- No matter what kind of computer disk it is, it'll be readable by any system you put it into. All application software is usable by all computer platforms.
- Laptops, for some strange reason, always seem to have amazing real-time video phone capabilities and the performance of a CRAY Supercomputer.

Login...



...the lumberjack way!



The Programmer's Bible

- Programming is like pinball. The reward for doing it is the opportunity of doing it again.
- At some time in the project you're going to have to break down and finally define the problem.
- Sleep? Isn't that a completely inadequate substitute for caffeine?
- Putting twice as many programmers on a project that is late will make it twice as late.
- You never find out the whole story until after you've signed the contract.
- The three most dangerous things in the world are a programmer with a soldering iron, a hardware type with a program patch and a user with an idea.
- Living with a programmer is easy. All you need is the patience of a saint.
- It's never the technical stuff that gets you in trouble. It's the personalities and the politics.
- Everything always takes twice as long and costs four times as much as you planned.
- You can always tell a good idea by the enemies it makes.

Not-so-friendly-neighbourhood Customer Support!

