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Smart phone, anyone?

Q. How do you know when a device has achieved 'smart' status?
A. When it has a 'reset' function, and an officially accepted security flaw.

Over the last couple of months, a slew of small, startling announcements add up to a clear turning point for the still humble mobile phone. For one, almost every phone manufacturer with Bluetooth-enabled phones has at least one model that gives total strangers around you, complete access to your phonebook and data. On some GPRS-enabled phones, they may even get free Web access using your account.

Until recently, a smart phone was simply one that incorporated PDA-like features. Now, they are busy pulling the ground from under the PDA scene, and aiming for bigger.

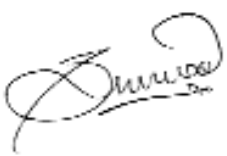
One sign of the impending transformation is that computing resources and battery power are available aplenty. Nokia announced upcoming support for Perl and Python scripting languages on their latest models. Scripting languages are resource hogs, but can be used to put together applications much more easily than is possible with more traditional tools, and can be credited for making the Web the accessible dynamic entity it is now.

Snake is passé, with a slew of adventure and strategy games being readied for the serious gamer. Now, both ATi and nVidia have announced graphics accelerators for pocket rockets. Pretty 3D effects and snappy graphics on 640 x 480 resolution colour screens will define the next frontier in mobile entertainment.

And now, for something serious—Toshiba has announced a new 2 GB hard disk, slightly more than 2 cm wide. That's two gigabytes of data storage, enough to comfortably carry an entire My Documents folder in a standard phone body. This, more than anything else, pushes the smart phone into a new league. You can actually carry around a useful amount of your work, and put all that processing power to good use.

But, for a little reminder of reality, the most exciting new feature for phones in the US is 'Push To Talk': A walkie-talkie-like service, which connects you—instantly—to any individual, or a closed group, without the hassles of dialing and waiting for a call to go through.

However, for all the fancy features, smart phones are still communication devices, and permanently busy phone networks the great leveler.



sumod_hajela@jasubhai.com

Sumod Hajela
Assistant Editor

"One sign of the impending transformation is that computing resources and battery power are available aplenty"

MARCH 2004

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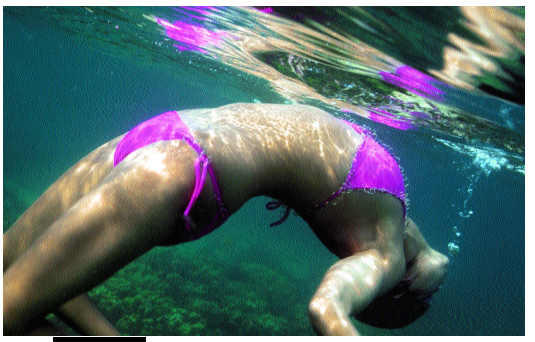

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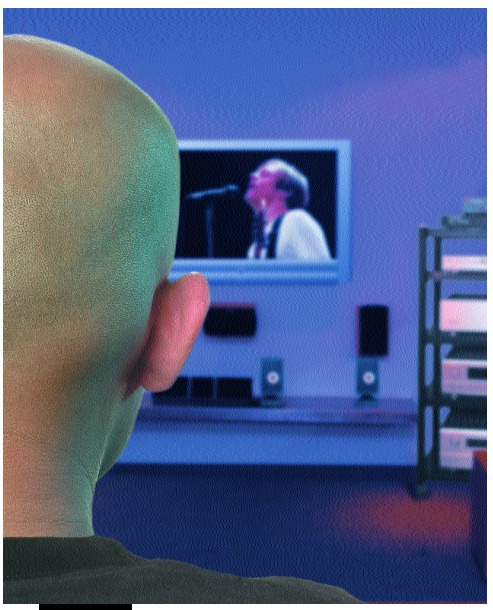

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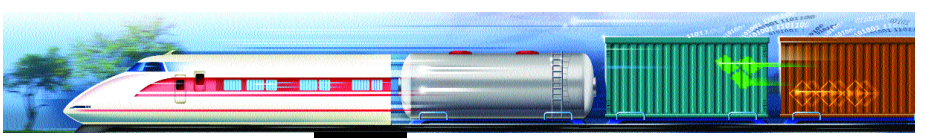

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Reviewed this month

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SOFTWARE

VOLUME 4, ISSUE 3

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Automize 5.5
Size: 7.86 MB
Mindware

Joan of Arc
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Playware

Expect these on the April 2004 CDs

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Run a Web server from your desktop
DevTools

AIDA32 System Information 3.90
Know more about your hardware and software
System

BootSkin
Change the boot screen of your OS to your liking
System

DivX bundle 5.1.1
Watch the latest videos with this codec
Essentials

Email Effects 1.6
Make interesting graphics using text
Home

Jabber Messenger
Chat on various networks such as MSN, Yahoo and ICQ
Internet

JAlbum
Create engaging photo galleries
Multimedia

myDoom virus removal
Test your PC for this viral infection
System

Peep Show 1.0
Cut see-through holes in windows and wrap mouse pointer
System

Quintessential Player(QCD) 4.11
Enjoy this feature-filled multimedia player
Multimedia

RssReader 1.0.44
Be in the loop with the latest news at hand
Internet

Torrent Search 1.1
Search for Torrent sources of files you want to download
Internet

KNOW YOUR CD

MINDWARE\SOFTWARE\DEV TOOLS

The Developer Tools section in your Digit Mindware CD brings you tools that you can use for developing software applications. The Developer Tools that we feature this month are the best tools that will aid you in your work—Try a free Web server, play around with a capable hexadecimal editor for binary files and create standalone help files. Also use software such as Resource Tuner to edit the resources attached with a binary file.

MUST TRY SOFTWARE

Mindware

This month we have a compilation of useful software across various categories and genre. There's something for everyone.

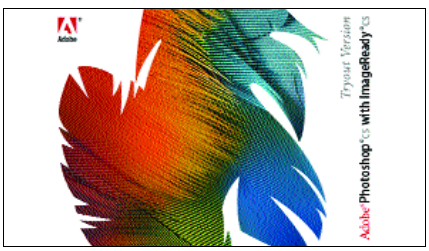
Resource Tuner 1.94 helps you interact with the embedded resource in an executable.

Winglobe 2.5 take you around the world to collect various data in a jiffy.

Adobe Photoshop CS Trial is one of the most feature packed and capable image editors around.

Mindmanager will help you get better organised, and hence more productive.

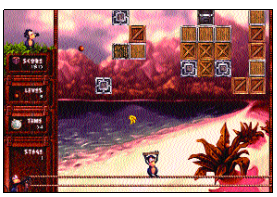
Power OS Commandar is a good alternative for managing files.



Playware

Bored with that drab PC of yours? Find on this CD, stuff to pamper you and your Windows.

Play this cool new incarnation of the Pac-Man game in **PacBomber.**
Watch the latest movie trailers including ***Shrek 2, Deewar, Hellboy and Around the World in 80 Days.***
Listen to some funky new music from **Hillbilly Hellcats** and others.



news feed

DIGIT MARCH 2004

hypethesis

Kessler a.k.a. Entertainment PC

■ What is it?

Intel wants to form a new home computing platform, powered by the 90 nm Pentium 4 Prescott CPU and supported by the upcoming Grantsdale chipset.

■ How does it work?

Grantsdale features dual-channel 400/533 MHz DDR 2 SDRAM support, PCI Express, the next generation of Intel's Extreme Graphics and Azalia—an audio sub-system with Dolby 7.1 surround sound. The graphics supports dual independent-display support, and the DirectX 9 API. Grantsdale will also feature a software-based Wi-Fi access point.

■ What does it do?

A platform definition that lays down what an Entertainment PC (EPC) should contain: primarily, a Prescott and Grantsdale, all inside a consumer electronics-style casing. The EPC is designed to work alongside consumer electronics devices such as big-screen TVs and hi-fi speaker rigs, rather than sit next to a monitor.

snapshot

119 million LCDs and 30 million CRTs will be shipped by 2007

Source: IDC/CNET News.com

Hey! You can't do that...

Community Web site, Neowin.net, first reported a source-code leak of parts of Microsoft's operating systems. The code was related to NT4 and Windows 2000; Windows XP inherits some of it. Another community Web site, Betanews, stated that the leak was traced back to Microsoft partner, Mainsoft, the company has access to Windows source-code, enabling the industry's highest level of Windows compliancy on Unix.

Security concerns turned real when a few days later, a hacker released an exploit that injects malicious code to trigger an integer overflow and execute arbitrary code when a special bitmap is loaded by IE 5.

Mahesh Benkar

Don't forget your desktop, dear!

You may soon be able to fold your desktop PC and carry it between home and office, underarm. At the time of writing this, Intel plans to unveil such a prototype.

The prototype has a 17-inch LCD with a handle on top to afford portability. It will be one of three models to be unveiled alongside two business notebooks—the trio are collectively termed Florence. The system will feature a keyboard that slides out of the back of the display. Intel envisions the unit to be used as a portable television: Its bevelled LCD hides a digital camera, speakers and a microphone.

It allows for a telephone handset for placing voice over Internet Protocol phone calls, and a remote for multimedia functions. Security is provided by a fingerprint sensor and a smart card reader.

Mike Trainor, chief technology evangelist of the Intel mobile platform indicated that the units will be powered by Sonoma, which comprises Pentium M processor, a set of support chips and a wireless module.

400 MHz dragons

Chinese newspaper, The People's Daily, claimed that processors designed by Chinese engineers will be marketed worldwide, following a deal with Wyse Technology. The Arca 2 chips in question have clock speeds of 400 MHz and a power consumption of 0.4 W. Wyse will initially use them in its network computers, powered by the Blazers OS.

MCSE at eight!

Sikkim resident, Mridul Seth, is most likely the youngest to earn the Microsoft Certified Software Engineer (MCSE) certificate. A mere lad of eight, he has accomplished what people thrice his age struggle at. He is believed to be the youngest MCSE, as on February 12 2004, he passed the Installing, Configuring and Administering Microsoft 2000 Professional Examinations held in Bangalore.

Mridul did not learn to speak until about 4 years ago. He was born without an external ear and his father, M.K. Seth, added that he was often sick when younger. At four, he learned to count from 1 to 100 within 24 hours, after which Mr Seth taught him higher mathematics.

Felicitated by Prime Minister A.B. Vajpayee, the family has now written to the Guinness Book of Records to acknowledge Mridul as the youngest person to earn the Microsoft degree.

■ In February, Yahoo! dropped Google, and implemented Yahoo! Slurp, its own Web crawler ■ Cisco offers desktop video-conferencing via VoIP

Wrong ASN.1! No cookie for you!

Microsoft has issued a warning to users running its Windows NT, Windows 2000, Windows XP or Windows Server 2003 operating systems. The warning encourages users to immediately patch their systems, or risk malicious hacks through a security hole. If left unpatched, the hole could allow a worm to spread throughout the Internet in a manner similar to the MSBlast attack last year.

The flaw exists in Microsoft's implementation of a networking protocol known as Abstract Syntax Notation One (ASN.1). The code under consideration is shared by many Windows applications, each of which can hence be used as an entry-point into an unpatched system by a hacker. Exploiting the flaw is much easier if the attacker can access a local network, an advisory posted on Microsoft's Web site noted.

The fact translates into a large number of vulnerable systems and thus a good candidate for an Internet worm attack.

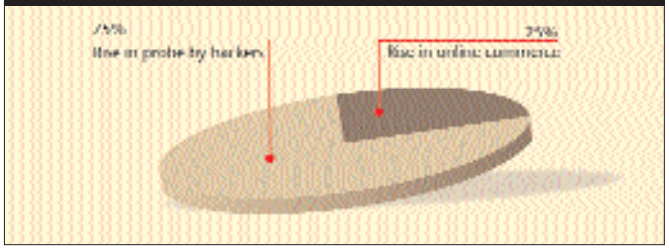
The flaw was first pointed out by the software firm, eEye Digital Security, and Microsoft issued a fix two hundred days later. Marc Maiffret, of the security firm termed the delay as ridiculous, while Microsoft's Toulouse said the fix took so long to create because of the difficulties posed by such a pervasive technology: "This is an instance where we really had to do our due diligence."

statattack

When the Mars rovers Landed on the Red Planet

Source: NASA

Online Commerce



Source: VeriSign

INFOGRAPHICS: Sachin Dalvi

A dash ridiculous

Lindows will now be known as Lin---s (pronounced as Lin-dash) in some European countries where Microsoft has blocked the availability of the desktop distribution.

"By removing three letters from our product name, Lindows.com will not be creating any confusion regarding Microsoft's supposed trademark on 'Windows', and still offer choice in the marketplace," said Lindows.com CEO, Michael Robertson. "Any action from Microsoft to block Lin---s will show their true intentions are not to protect their trademark, but to eliminate competition and maintain their monopoly." This step was taken by the company to comply with an Amsterdam court ruling. The company has also opened new Web sites—Lin---s.com and Lindash.nl—to support the same.

nVidia for Palm

PalmSource recently announced a partnership with nVidia. It will provide nVidia with Palm OS Garnet and Cobalt tools that will enable creation of drivers for the GeForce family of media processors, making them available to Palm OS licensees.

The GeForce 2150 media processor includes a 64-bit 2D graphics accelerator, embedded memory for LCD frame buffer and a 1.3 megapixel camera support. It also supports TFT and OLED technology, at up to a 320 x 480 resolution.

Earlier, PalmSource announced the release of Palm OS Garnet, while the Palm OS 5.x release has been renamed Cobalt.

redalert

W32.Netsky.B@mm

This mass-mailing worm only affects Windows 9x, Windows NT, Windows 2000 and Windows XP systems. It does not affect Windows 3.x, Macintosh, Linux and Unix systems. A built-in SMTP engine lets it propagate through all e-mail addresses obtained while scanning hard drives and mapped drives. It also infects files with extensions such as .TXT, .HTML, .DOC, .VBS and .DBX. It copies itself into the services directory and many other folders, makes registry changes and degrades system performance. Access its removal tool from ***http://www.symantec.com/avcenter/venc/data/w32.netsky.b@mm.removal.tool.html***

Real trouble

Recently, RealNetworks discovered that RealOne Player and RealPlayer were vulnerable to three specific exploits while executing RealPlayer files with the extensions .RP, .RT, .RAM, .RMP and .SMIL. These files render the user's system vulnerable to download and run any malicious code. The exploits include executing remote JavaScript from the domain of the URL opened by the malicious file, download and execute arbitrary code on the user's machine, and create buffer overrun errors. Download the fix from ***www.real.com***.

snapshot

60 per cent of all e-mails sent in January 2004 were identified as spam

Source: Brightmail Logistics and Operations Center

➜

■ Individuals counter sue RIAA under US government anti-racketeering laws ■ Lindows now features support for Intel's mobile Centrino technology

Some Linux with that?

The 2.6.x kernel release brings a faster GUI, in tow with Advanced Linux Sound Architecture (ALSA) support, amongst other goodies.

Hot on its heels, is the 3.2 release of the KDE desktop environment system, with improved speed, better cross-application integration and a cleaner menu structure. The team behind Gnome is also at work at a 2.5.x release. One finds that its Nautilus file manager now supports spatial browsing; also seen are audio-mixers using ALSA and a few tweaks to the Epiphany browser. This release branch is on its 2.5.5 Development Release however, so a usable version is some ways off.

IBM has announced its intent to migrate Microsoft's Office suite to Linux. Microsoft however, denied any involvement, stating that IBM is going solo on this ride, further stating that no source code has exchanged hands to facilitate such a transition.

An OLED to displays

An organic LED (OLED) is made of semi-conducting organic polymers and is cheaper to fabricate. An OLED display doesn't require a backlight and draws far less power.

A market research company, iSuppli, offers that OLED displays are becoming a credible alternative. The Inquirer (***www.theinquirer.net***) quoted Kimberly Alton, director strategic research at iSuppli, from a report called Emerging Displays Review. Kyocera will develop colour passive and a-Si-based active OLEDs . Chi Mei, ID Tech and IBM demonstrated a 20-inch OLED panel. Sony will commercialise an OLED-based panel in spring this year.

Showdown after sundown

Bluetooth has a serious contender. At the time of writing this, Intel was all set to demonstrate its Wireless USB 2.0 technology at the Intel Developer Forum. The technology tows high-speed data transfer up to 480 Mbps over 4 metres, and up to 110 Mbps over 10 metres. The Bluetooth 1.1 standard can touch 1 Mbps for a distance ranging from 10 to 100 metres, the speed dropping with distance.

Wireless USB will be based on the multi-band Orthogonal Frequency Division Modulation (OFDM) technology, along with the Ultra-Wide Band (UWB) radio platform defined by the WiMedia alliance.

Cameras, camcorders and MP3 players are also not too happy with the slow transfer speeds offered by current Bluetooth implementations; an area that analysts clearly see the Intel-backed wireless initiative take advantage of.

Intel follows AMD's lead

Intel is all set to follow in AMD's footsteps by bringing 64-bit extensions to both its 32-bit server chips (Xeon) and desktop processors (Prescott). Code-named Nocona, the Xeons will support PCI Express, DDR2 memory, the 64-bit extensions and SSE3.

Nocona chips for two-processor servers will arrive in the second quarter of 2004, said CEO Craig Barrett, followed by Prescott processors with 32 and 64-bit capability for single-processor servers and workstations. Prescott and Nocona are functionally the same, but differ in cache size and bus speed.

Meanwhile, AMD is ready to put some money to its mouth, and shout from the rooftops that the Intel move is a validation of its claims: The future is x86-64. Intel's 64-bit extensions will be 100 per cent compatible with AMD's—save a few extensions to allow for extra registers, etc.

heroes

64-bit computing

Microsoft has released a public preview of the 64-bit Windows XP for 64-bit Extended Systems, signaling a release later this year. *UT2004* will also feature 64-bit support. Intel also plans to release a 64-bit version of their server-targeted Xeon.

Home Networks

Intel and Microsoft, along with Canon and BEA Systems, are working on standardising the Web services protocol called WS-Discovery that will let all sorts of home media devices interconnect, forming an ad-hoc network.

zeroes

Linux security

UK Security firm, mi2g, analysed 17,074 successful digital-hacker attacks and found Linux servers accounted for 13,654 breaches. BSD and Mac OS X were at the bottom of the list with 555 successful attacks. Windows systems accounted for 2,005 attacks.

DVD-copying software

A San Francisco District Court judge ordered 321 Studios to withdraw all copies of their product and make changes to their controversial DVD-copying products. This would prevent users from using the descrambling tool to duplicate copy-protected DVD movies.

snapshot

NASA's Web site received 6.5 billion page views since January 2004 due to the Mars mission

Source: NASA

■ FBI to place piracy-warning seals on all audio and video media sold ■ Microsoft to ship Windows security updates CDs at no charge

The 64-bit itch

64-bit computing for consumers is now several steps closer to fruition. The contenders are: The x86-64 solutions from AMD, i.e., the server chip, Opteron, and the desktop chip, AMD 64, an x86-64 Intel Pentium 4-based Prescott chip for the desktop, and IBM's PowerPC 970FX for Apple-based solutions.

The IBM solution won the Microprocessor Report Analyst's Choice Award for Best Desktop Processor. It is a 90-nm, but unlike the Intel processor, it consumes far less power. IBM claims that the 970FX draws about 25 W running generic applications at a speed of 2.0 GHz—50 per cent lesser than the PowerPC chip that powers the Apple G5. Compare this to Pentium 4 3.00E (the Prescott), which puts out 89 W of heat and the efficiency becomes apparent.

The Pentium 4 CPUs, with 1 MB L2 cache on the 90 nm process, will be tweaked to improve its power rating. At the Intel Developer Forum, February 2004, Craig Barrett of Intel confirmed that Nocona, its next generation of server processors—Xeons and desktop Prescotts will both get 64-bit extensions later this year. Supporting the move is Microsoft's OS-level support: A beta version of Windows XP for the x86-64 is already doing the rounds.

snapshot

Google currently indexes over 6 billion documents; 4,28,51,99,774 of which are Web pages

Source: Google, Inc

Linux shining

After a personal nod from President A. P. J. Kalam Azad, Linux and the open-source movement made further inroads into India. Seven government and private institutes plan to use Linux to run Oracle applications, the company recently announced. "2004 will be the year of Linux in India," Shekhar Dasgupta, Managing Director of Oracle India, said in a statement. "We see the banking, government and education sectors leading the adoption of Linux to run mission-critical applications."

The agencies benefitting from this move include the state-owned Central Bank of India, Bharat Sanchar Nigam Ltd, the treasury department of West Bengal and two private banks. Indian Railway Catering Services and Tourism said it has chosen Red Hat Linux to work with Oracle's e-business suite. Linux will allow for a 30 per cent saving in IT expenses—about Rs 180 million per year.

The major attraction for government and large organizations towards Linux is two-fold: price is obviously a factor, although not a large one, since supporting an operating system is a factor that needs to be considered; the honey-pot is the fact that the source-code of the Linux kernel and its supporting cast is freely and publicly available for scrutiny and modification. This is a huge boost to institutes where paranoia is a positive trait, and security is paramount.

To counter this mindset, Microsoft recently announced its intent to share the source-code of its Windows family of operating systems with Asian governments and institutes. Indeed, after the success that Linux was enjoying in the Thai marketplace, Microsoft began offering Thai citizens a bundle of Microsoft Windows XP Home and Office XP Standard. Platform-jumping is a rare event in both a consumer's and a businesses' life-cycle; Microsoft obviously wants to capture upcoming markets before Linux gets a toe-hold.

Enterprise shutterbugs, only

Canon India recently set up India's first two Digital Imaging Solutions Laboratories for enterprise users in New Delhi and Bangalore. The lab is going to be a testing ground to try out new innovations and ideas for businesses of all sorts. It will simulate real business environments and allow their customers to inspect, test and try out proposed ideas and solutions in the fields of document management, transaction printing, and colour applications for offices and enterprises. This can be done at minimal costs. Canon claims to have spent Rs 60 crores on the lab, and has expansion plans in mind.

Spam

Now it's IM's turn

Spam over the Instant Messaging (IM) or SPIM is not a big problem now because the username list for IM clients as well as the tools to mass message are not commonly available.

Yahoo! has already taken measures to prevent misuse. First, while registering, you have to go through an image-verification test that automated systems cannot pass. It also blocks users who send unusually high number of messages.

Microsoft also lets you see the list of people who have added you on their list in its new version (6.1). You can choose to block messages.

Dragooning spam

The Chinese government is taking the problem of spam seriously and is fighting hard against it. Recently, the Ministries of Public Security, Education and Information announced an anti-spam campaign that also targets reactionary spam. 'Reactionary' is a political term used for individuals and content considered to be threats to the Chinese government.

In February this year, the Internet Society of China (ISC) identified 626 servers, including 68 in China and 6 in Hong Kong as sources of spam. ISC said that they have taken some measures such as getting e-mail providers to adopt anti-spam technologies. However,many Chinese servers are working as spam relays due to the rapid Internet expansion. Thus, those run by China Telecom and China Netcom Communication Group have also been blacklisted as spam relays.

➜

■ Adobe server software to help restrict access to electronic documents in workplaces ■ StreamCast Networks to unfurl low cost Net telephony service

India Inc.'s roll

There's been a lot of India-related news in the international job and outsourcing front. The American state of Colorado voted to postpone a bill that prevented jobs from going to offshore workers, especially for state contracts. US businesses find outsourcing to India a cheaper deal than getting work done locally. Moreover, India's big pool of talented and highly skilled workers works for far less than their American counterparts.

In related news, the US government has exhausted their current quota of H1-B visas for the current fiscal year, with no visa applications being accepted until April 2004, and none being issued till October of this year. The H1-B visa programme attracts large numbers of skilled Indian technologists, and has been very controversial in the US.

In yet another development, a US Congressional panel raised concerns on the apparent misuse of L-1 visas that allow companies to get in skilled workers in executive and managerial positions, with no limits on the numbers issued, or a required pay limit. Witnesses allege large-scale cases of fraud to get in temporary workers into the US, and the associated loss of jobs for locals.

snapshot

The value of Time Warner Inc. is now US$ 42 billion lesser than their value before merger with AOL

Source: Fortune

Smile, you're on CCD

Take a digital camera, and you have found yourself a Charge Coupled Device (CCD); move lower down the digital chain to that camera-phone you have been eyeing, and a Complementary Metal-Oxide Semiconductor (CMOS) stares back. Both the technologies are meant to capture images, but they differ in cost and quality offered.

A CCD is ideal for high-quality captures, and has good low-light sensitivity. However, it is expensive to produce and a drain on the batteries. A CMOS is cheap to make, and lighter on the batteries. Its image quality however, leaves much to be desired. Can't have it all... or can you?

Japanese major Matsushita has taken the first step toward creating Maicovicon, a hybrid sensor that has the advantages of both the chips. *EETimes* reported that Maicovicon consumes less power than a CCD, and offers higher image quality than a CMOS sensor. It will be available in

1.3 megapixel and 2 megapixel versions with a pixel size of 2.8 mm square. Photosensitivity is about three times that of CMOS sensors and almost equal to that of CCD sensors.

This hybrid should herald a new wave of low-powered devices sporting affordable and better-quality cameras.

tomorrow's technology

Siliconnect

Intel researchers have developed a silicon-based optical modulator operating at 1 GHz—an increase of over 50 times the previous research record of about 20 MHz. The device incorporates a transistor-like structure to encode data onto a wavelength of light. The modulator splits the incoming light beam into two. These are then phase-shifted to change the amplitude of the resulting, recombined beam. The result is the ability to change light from bright to dark and thus, encode data.

This allows for faster connections between PCs, servers, and manufacturing of faster buses and interconnects inside a PC. While CPUs are projected to meet future bandwidth demands, the bandwidth of the interconnects needs to be increased to prevent bottlenecks. Photonics (using photons as data carriers instead of electrons) offers greater bandwidth than copper networks, and carries multiple signals simultaneously without interference. However, commercial photonic devices are difficult to assemble and expensive. This high cost limits the their use to special applications such as telecommunications and wide-area networks.

quoteworthy

"I may have invented [Control]+[Alt]+[Delete], but Bill Gates made it really famous"

David Bradley, now retired IBM employee who did pioneering work on the original IBM PC. Bradley was speaking to a gathering on the 20th anniversary of the PC.

"I never expected it to be precise. It turned out to be much more precise than I ever imagined"

Gordon Moore, Co-founder of Intel, who formulated Moore's Law, which states that the number of transistors on a chip would double every year, and later, 20 months; Intel executive, David House, later accurately re-calculated it as 18 months.

"There's no reason to wait for any other x86, 64-bit technology, because we have it now, we're shipping it now"

John Robinson, AMD's country manager for Australia and New Zealand, talking to iTnews Australia. Robinson claimed to be baffled after Intel announced its plans of shipping new Xeon processors with 64-bit extensions on the existing 32-bit core by the next quarter. AMD has already got a 64-bit processor for the desktop, the Athlon 64.

■ Intel committed to offering full-scale Linux driver support for their hardware using the same driver update and release cycle as that for Windows

Jai Hind

With the launch of Microsoft Office in Hindi, the company has fulfilled a long-standing demand of the Indian market. India is a country where only five per cent of the population can communicate and work using English. Yet, all the software available was essentially for this small minority.

Mahesh Benkar

The readership of Hindi newspapers far outnumbers readership of English newspapers, yet Hindi readers could not communicate well with the media companies because they lacked a good Hindi interface on their PCs. Since Microsoft Office (Hindi) allows use of English, as well as nine other Indian languages in the same system, union and state governments should instruct their departments and undertakings to switch over to this for effective e-governance.

Madhu Agrawal
Via e-mail

digit

Dear Madhu,
You could not have been more accurate in your assessment. Communicating in the peoples' language is the hallmark of any e-governance model. Both, state and union governments in India, have been using regional language software for some time now, so Microsoft's Hindi language tool is not groundbreaking. Yet, it is also true that Microsoft's Office suite is the most commonly used PC application. Your suggestion, in that sense, definitely holds merit.

Cell 'n' accelerator

Firstly, my heartiest congratulations for three great issues in a row—December, January and February. Every issue was packed with cool stuff, including extra CDs, the Zero1 awards and of course, the *Ice Age* VCD. Now I am eagerly awaiting a full-fledged edition on cell phones. Hope you won't disappoint me.

Ashish Pawar
Via e-mail

I am studying to be a computer engineer, and I make it a point to go through all the PC and technology magazines available at the newsstand. But the Digit February issue was the best. Does it rock, or what! I found the reviews of motherboards, RAM chips and processors quite helpful.

When are you reviewing graphics accelerators, especially since they are now affordable? One more observation: The article on LiLo was brilliant, and it is a good beginning!

Avik Chakraborty
Via e-mail

digit

Dear Ashish and Avik,
First of all, thank you for those kind words. Of course we will review cellphones, Ashish. Since we cover the entire gamut of technology, we were bound to cover a lot other things too. But if you read our Bazaar section for the last six months or so, we have been reviewing cell phones regularly. This month, too, we have tested and reviewed the Handspring Treo 180 PDA phone and the Nokia 6600 camera phone (*turn to Page 88 of this issue for more*).

Nothing pleases us more than to hear that our readers liked Digit, and found it useful. We will definitely incorporate your suggestion in the forthcoming issues.

Price, please!

I bought a branded PC last September, and it was also the day I bought Digit for the first time. I have not missed a single copy of the magazine ever since. Well, I just could not afford to. May I suggest something? Digit should include prices of major PC components such as RAM, motherboards, graphics cards, etc. It will be a great value-add for readers like me.

Abhishek Sood
Via e-mail

digit

Dear Abhishek,
Your suggestion is priceless. At Digit, we have contemplated printing prices of components a lot of times, and which is why we have the A-list (*found on page 86 and 87*). Here, we list the prices and the contact information of components in two categories—Best Value and Best Performance. However, we are hampered by the fact that these prices fluctuate at regular intervals, usually within days. And because Digit is a monthly magazine, the prices at the time of printing may not be the same as when you receive the copy at home, or when you pick it up from the newsstand.

Nahi CDsi baat

I was disappointed with the February 2004 issue. The CDs did not auto-play. I installed the Flash player, yet the CDs did not run, and all I got was a blank white screen. As a last resort, I went back to the basics—opened my Windows Explorer and right-clicked the CD drive to open. I got all the software I needed, but it was a boring experience, since I missed your design.

Upneet Shah
Via e-mail

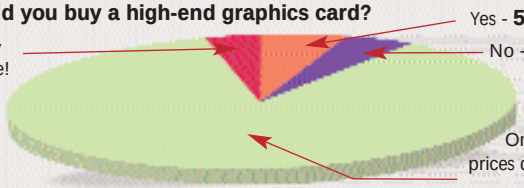
digit

Hello Upneet,
The reason your CDs did not run despite installing the Flash player from the CD is because some of the components are still missing on your PC. The best option, in this case, would be to download the Flash player directly from the Macromedia site. It is only a 480 KB plug-in, and should not take more than a minute to download. Once installed, please close your browser window, and start the CD interface again.

digit READER POLLS

Your vote counts

Q. Would you buy a high-end graphics card?



Responses: 6480

This month's question:

Have you bought a new PC or a laptop, or upgraded your system, after low prices following the mini-budget?

☐ Yes, I bought a PC
☐ Yes, I upgraded
☐ Yes, I bought a laptop
☐ None of the above

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

Planet Digit Feedback

Planet Digit, a technology event by Jasubhai Digital Media, the parent company of Digit, was held successfully in Mumbai and Bangalore, where more than 20,000 people visited. However, it was cancelled in three cities—Chennai, Delhi and Kolkata, which led to some readers complaining about it. Here is some feedback we received.

Gentlemen, kudos for the magnificent non-performance of Planet Digit Chennai.

The least one would have expected is a small ad in newspapers announcing the cancellation, whatever may be the real intentions. Who is the real culprit—Digit or the participants?

Whatever the cause for this Event of Jokers 2004, today I am ashamed to call myself a Digit subscriber.

In disgust,

P C Vaidyanathan
Via e-mail

The cancellation of the Chennai Planet Digit was a pity because I did not get your e-mail about the cancellation. I was disappointed because there was nobody from Digit there. All I could see was a message on the wall regarding the postponement, and something about a gift to make up for the disappointment. But how could you have given away gifts if there was no one around. Moreover, no one knew where TNTPO is. And very few people knew that it's popularly called the Chennai Trade Centre.

K P Gopal
Via e-mail

First the brickbats—the event was hyped beyond reason, and as a result, I was disappointed. Your advertisements in newspapers were misleading. The Samsung pavilion had a lot of cool stuff, but occupied almost the entire ground floor. Then, your Gaming Drome was not as advertised. OK, now for the good stuff: I had a ball playing *Unreal Tournament 2003* while it lasted. I even won two or three rounds. The small games were a nice touch, but honestly, you should have priced the coupons lower.

Vivek Singh
Via e-mail

Map for Lam' Rd

Dear Sir,

I am a Sri Lankan citizen, and a regular reader of Digit. Sometime ago, I read about the secondhand dealer shops in Lamington Road in Mumbai. I plan to be in Mumbai sometime soon. I'd like Digit's help in understanding 1) Where is Lamington Road and 2) Are shops on Lamington Road open on Sundays?

Darrel Silva, Sri Lanka
Via e-mail

digit

Dear Darrel,
Lamington Road is a fairly large area in South Central Mumbai where you would find all kinds of electronics and IT dealers. Indeed, for Mumbai's citizens or even for others, this place is a virtual IT paradise as far as buying goods are concerned. If you are in Mumbai, all you need to do is hop into any cab, and ask him to head straight for Lamington Road. And oh, don't go on a Sunday—most shops will be closed.

digit

Planet Digit's aim was to create a live demonstration of cutting edge technology applications that Digit's readers only got to read about. While the who's who of India's IT sector participated in Planet Digit, there were only a few companies such as AMD, Samsung, Apple and HP who could demonstrate the practical applications of technology.

Based on reader feedback in the first two cities—Mumbai and Bangalore—we found it was not worth our readers' time to just come and see products on display without any applications shown on it by a majority of the companies.

Rather than disappoint our readers in Kolkata, Delhi and Chennai, we decided to suspend Planet Digit at these venues and come back with a show where our partners truly live up to the promise of delivering great technology solutions through demonstrations, rather than build a product gallery for our audiences who already know their product range well.

Team Digit

The Winner of the 'Post your best Planet Digit Experience' contest is...

Karan Mehta
Adios amigos, take care

Posted: Sun Feb 01, 2004 5:35 pm

Howdy fellow techies! Planet Digit is the place to be. You have to be here to see what a 61-inch flat screen by Samsung looks like. Anyway, my best experience is as follows...

As I was waiting for my father to fill up the forum, my eyes fell on the 'I will sketch you too!' poster, to get sketches made by Mr Mahesh Benkar. As a great fan of Mr Benkar's illustrations in Digit, I waited my turn. I grabbed the opportunity to meet him, greet him and congratulate him for all the wonderful illustrations that have made the dullest of articles interesting. Meeting him has been an amazing experience, which I will not forget. To top it all, Mr Benkar has invited me to visit him at his Digit office... like a cherry on the cake!

GoOf Ups

- On the contents page, the image for Own your E-mail, erroneously states its page number as 74. It is, in fact, 82.
- The winner in the Intel low-end motherboard category is the Mercury Pi845GLM-L board, not the Mercury PS650GXM-L as the caption on page 48 suggests.

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

E-mail: readersletters@jasubhai.com
Send your letters marked 'Readers Letters' to the Digit office:
D-222/2, Om Sagar Building, MIDC, TTC Industrial Estate, Nerul, Navi Mumbai 400 706
Phone: 022-27629191/9200 Fax: 022-27629224

Reversible Computing

> "Our civilisation will depend on exploring the problems that reversible computing poses"

Michael P. Frank, as a graduate at MIT, designed one of the first universal DNA computers, and discovered that it had to be reversible for fundamental thermochemical reasons. Since his graduation from MIT in 1999, Mike has been continuing his reversible computing research as an Assistant professor at the University of Florida's Department of Computer and Information Science and Engineering. *Digit* caught up with him to speak about reversible computing.

What is reversible computing?

Reversible computing—revcomp for short—is the application of principles of recycling to computing. When a computer performs a logical operation, the unwanted bits after the operation are thrown away, and dissipated as heat. There is a limit on how far we can keep doing this. If we want computer speeds to keep on increasing, we need to 'uncompute' the unwanted bits.

Reversible computing means computing using a physical mechanism that is thermodynamically reversible—one that ballistically coasts along through its computation with low friction. Thus, it will dissipate only a small fraction of a bit's energy to heat with each logic operation.

If a computation is thermodynamically reversible, it would need to be logically reversible as well. Performing any desired computation is still possible, despite this constraint. But it strongly affects digital logic designs. In the long term, it will impact instruction sets and high-level programming languages as well. Eventually, these will also have to be reversible to provide optimal efficiency.

Why do we need reversible computing?

With device sizes fast approaching atomic-scale limits, more energy efficiency is essential. Energy efficiency fundamentally affects the speed of circuits—such as nanocircuits—and therefore the speed of most computing applications. Ballistic circuits that conserve information, by uncomputing bits instead of throwing them away, will soon offer the only physically possible way to keep improving energy efficiency.

What is a ballistic circuit?

A ballistic process is a process in which a system proceeds forward under its own momentum, with only a small fraction of the free energy in the system being lost to heat. For example, when an ICBM (Inter-Continental Ballistic Missile) makes a flight between continents, it 'coasts' (movement of a vehicle with hardly any generation of heat) for most of its journey, with only a small portion of its potential and kinetic energy being lost to friction during its trajectory through the atmosphere.

How soon do you think revcomp is going to become important?

It will become important when the chip-making industry runs out of other tricks for reducing the energy cost of logic operations. Throughout the history of the industry, it has been reducing the energy cost of logic operations by reducing bit energies; but, there are some absolutely irrevocable limits to this process. These limits will be reached within the next three decades. This has to do with the fact that the density of all of the physical information that is present in materials at normal temperatures and pressures is finite, and moreover, it is quite limited—at most, a small handful of bits per atom. We can never store a logical bit using less than 1 physical bit, and the irreversible transformation of a physical bit results in heat energy that must be expelled into the environment. In room-temperature environments, this results in a strict maximum of about 300 billion billion irreversible bit-operations that can be performed per Joule of energy consumed. This may sound like a lot, but we are only about a factor of 1,00,000 below this point. If past trends continue, we would expect to reach this point in only another 25 years, or so.

Why do we need to bother about it now?

To make reversible computing practical, there are many difficult engineering research problems that remain to be solved, such as the design of extremely high-quality oscillators. If we don't start working hard on developing solutions for these now, there is a significant danger that solutions will not be ready when traditional approaches run out of steam. If this happens, the development of computer technology will stall—no longer will we be able to expect that every year we will be able to get a more powerful processor with lower power consumption, which can be utilised for new applications not previously possible.

This can have a significant braking effect on the growth of the entire world economy, since productivity growth in many industries today relies largely on the increasingly extensive application of information technology. The rate at which IT can penetrate into new application areas will drastically slow down, if the performance-per-unit-power-consumption of digital technology stops improving.

> "...we risk hitting a technological plateau within the next 30 years."

If we do see a reversible computing device in as soon as 25 years, what will it look like? If not a desktop or a laptop, what will it be?

I believe that desktop and laptop—or maybe wearable, or even implanted—personal computers, will be a major potential area for application of revcomp technology. For example, powerful 'personal assistant' and 'intelligent agent' type applications might be built, using sophisticated artificial intelligence techniques. These algorithms require extremely high-performance computing capabilities. The more performance you have, the 'smarter' these techniques can become—with essentially no limit. Reversible computing is ideally suited for running these artificial intelligence algorithms, because they can all leverage a very high degree of massive parallelism.

If this is available, these algorithms do not even require extraordinarily high sequential performance. For comparison, individual neurons in the human brain, fire at frequencies of only about 1 KHz. Because there are on the order of 1 billion billion synapses packed into your skull, this translates to a total rate of about 1 quintillion (10^{18}) synpatic operations per second. This is about a thousand times greater than today's desktop computers. So, we can expect that achieving capabilities comparable to the human brain will require at least a thousand times greater performance than any desktop computer has today, as well as sophisticated AI algorithms. However, the example of the brain teaches us that intelligence does not necessarily require the individual devices to operate at extremely high frequencies.

The goal of AI, thus, fits perfectly what reversible computing offers, which is a much larger overall rate of operations within a given power budget. This will be achieved through massive parallelism of large numbers of extremely energy-efficient micro- or nano-scale devices. These can individually operate at only a moderate speed, which is required in order to maintain their high energy efficiency.

How realistic is the 25-year timeframe you spoke about for reversible computing to become mainstream?

I do not know for certain whether the semiconductor industry will continue to find it economical to continue taking conventional computer technology forward for as long as 25 years at the same rate that the technology has been progressing for the last 40 years or so. It is very difficult to say, because many problems to further progress loom close ahead, yet many ingenious ideas have been proposed that may push the limits a bit farther out. However, the point is that at whatever time the conventional approaches run out of steam and stop improving so quickly, reversible computing will then be the only way to rapidly introduce further reductions in power dissipated per unit of performance. If the traditional approaches hit a practical limit and stall in considerably less than 25 years, then so much the better for reversible computing!

You spoke about micro- or nano-scale devices, and massive parallelism. Where is the intersection between nanotechnology and reversible computing?

The fundamental limits on the energy efficiency of conventional semiconductor-based computing also apply identically to all possible nanotechnologies. As a result, nanotechnology, if not augmented by reversible computing, can only inch us a bit closer to the limits of irreversible computing than semiconductors might be able to get, but it cannot take us beyond these limits. The only way that nanotechnology can possibly circumvent energy dissipation limits, and keep computer performance improving beyond the next two or three decades, is if it wholeheartedly and thoroughly adopts reversible computing principles.

In the 1980s and 1990s, K. Eric Drexler and Ralph Merkle, the pioneers of nanotechnology, discussed the need for reversible computing in nanotechnology, and designed a wide variety of nanoscale mechanical and electronic reversible logic mechanisms.

If reversible computing is so fundamental and important, how come we've never heard about it until now?

The lack of attention to reversible computing has been due to a stew of misconceptions about revcomp that have been floating around. For instance, myths circulate that reversible computing has been proven impossible, or that it violates some law of thermodynamics, or that it is fundamentally impractical. None of these myths are true—no valid proof of any of these claims exists anywhere in the literature. I know, because I have spent years searching for one—since I have no desire to waste my career pursuing an impossible goal! There have been a number of attempted proofs of the impossibility of reversible computing, but all of them contain either fatally-flawed assumptions, or logical fallacies.

It is not an exaggeration to say that the entire long-term future of computing technology, and indeed of our entire civilisation, will depend on exploring the problems that revcomp poses. We need to start seriously tackling these problems today, or we risk hitting a technological plateau within the next 30 years. And, if the industry ever becomes accustomed to a state of stagnation rather than of growth, who knows how long it will take us start things up again? For us to ignore reversible computing today seems a far more dangerous strategy than for us to pursue it with vigour.

RAM MOHAN RAO
ram_mohan@thinkdigit.com

WHAT'S in Store?

...for hard drives and memory

The world's hunger for processing power is insatiable, and for storage capacity and speed, even more so. Storage devices—both volatile, as in RAM, and non-volatile, as in hard disks—are always getting larger and faster. New technologies and methodologies seem to be forever on the horizon. Recall that when Intel released the original Pentium, it was believed by many that a limit on the number of transistors that could be crammed onto a chip was being approached. Will there ever be some sort of fundamental impediment to further development?

Not if research continues at the current rate, driven by worldwide, exponentially ever-increasing demand. Storage research is looking at everything—from materials to fabrication methods, to novel techniques. And every once in a while, something comes up that takes performance up by an order of magnitude.

It seems that the industry will continue to deliver—you'll have a terabyte hard disk a few years from now, and a pentabyte one a decade later, with RAM to match.

Hard disks

The hard disk, the mainstay of personal and corporate storage, has faithfully obeyed the exponential law. This has happened largely due to increases in areal density, that is, how many bits are crammed into, say, a square inch. A lot of research in storage focuses on how to improve areal, and therefore data, densities. However, in a couple of years, a limit on the areal density that disks can achieve will be reached. This limit will be due to the superparamagnetic effect.

Bits on a hard disk are encoded by changing a magnetic property of the disk material—the spin. The superparamagnetic effect (SPE) happens when bits are crammed too close together. When this happens, the energy holding the magnetic spin in the atoms making up a bit becomes smaller, and comparable to the thermal energy of the atoms. This means that the bits may get demagnetised—they may randomly change (flip) from zeroes to ones, or vice-versa, leading to data corruption. The SPE may become important as early as next year.

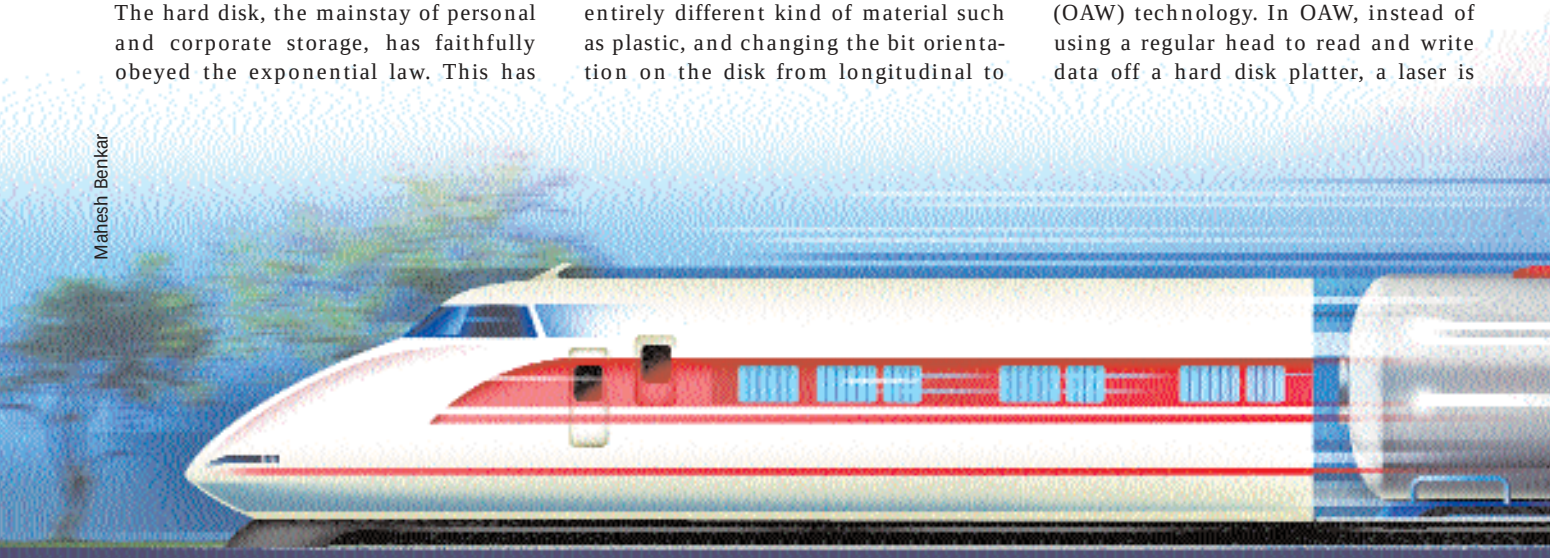
Perpendicular recording

Several techniques are being looked into to overcome the SPE, and therefore allow one to cram more bits together, while preventing them from flipping. These include using different magnetic materials more resistant to the SPE, using an entirely different kind of material such as plastic, and changing the bit orientation on the disk from longitudinal to perpendicular. Of these, the last—called perpendicular recording—holds the most promise, and is widely believed to be the recording technology of the future. The concept is simple: in conventional-longitudinal-recording, the magnetisation of the bits is parallel to the direction of the movement of the head. With perpendicular recording, the bit magnetisations would be perpendicular to the head movement.

Dr Mark Kryder, Director of Seagate Research, says there's time before longitudinal recording will need to be widely employed. According to Dr Kryder, the switch to perpendicular recording will occur at an areal density of somewhere between 100 and 200 gigabits per square inch. This switch would open up the potential for unprecedented areal density increases. He says, "We estimate that perpendicular recording methods may take us all the way to one terabit per square inch. When that level is reached, a single 3.5-inch disk will store over one terabyte of information."

OAW technology

Quinta Corporation, a subsidiary of Seagate, combated the SPE limit in 1999 with its Optically Assisted Winchester (OAW) technology. In OAW, instead of using a regular head to read and write data off a hard disk platter, a laser is



Mahesh Benkar

used—this makes for extreme precision. The polarisation of a light beam is twisted when it bounces off a magnetised surface. When this is passed through a polarising filter, the intensity of the beam gives the magnetic alignment of the part of the surface that it touched—this is how the disk is read. For writing, the same laser heats a dot on the disk to a temperature at which the material's magnetic properties can be changed—to reflect either a one or a zero—using a magnetic coil.

Essentially, since a laser is so precise, it can focus on areas much smaller than are used to represent a bit on a traditional hard disk. This makes for higher data densities.

Jargon Buster

- **Holographic Storage:** Holograms, unlike, say, regular cameras, record not only the intensity and colour of light, but also its direction. As a result, holographic crystals record data in three dimensions. This means that data is stored over the volume of the crystal, not its surface. Holographic storage has promised storage densities of one terabyte per cubic cm.
- **Areal density:** The areal density refers to how densely bits are packed on the surface of a material or device, for example, a hard disk platter.
- **Cantilever:** A cantilever is a horizontal fixture, such as a mechanical arm, that projects beyond a vertical support, and is unsupported at one end.
- **Nanocrystals:** Nanometre-sized semiconductor particles. Due to their size, they don't behave like bulk materials, but like atom-sized quantum entities.
- **Pipelined operation:** Say an instruction has three parts to it: fetch, read data and execute. A processing unit is doing pipelined operation if, for example, it routinely does the 'read data' part of instruction #2 while doing the 'fetch' part of instruction #3, like in an assembly line.

AFC media

In 2001, IBM demonstrated yet another way to get round the SPE: a three-atom-thick layer of ruthenium, sandwiched between two magnetic layers. Known as Anti-Ferromagnetically-Coupled (AFC) media, the multi-layer coating permits disks to store 100 gigabits per square inch, as of now. The ruthenium layer makes the adjacent layers orient themselves magnetically in opposite directions. When bits are written onto layers, they can be placed closer together than if a single layer were used—meaning higher areal density.

Patterned-media recording

One bit on a disk is stored as a group of several small grains. Each of these grains is thermally unstable, and the SPE comes into play. In patterned-media recording, one bit is stored by one grain; a grain can, therefore, afford to be larger. Thus, data integrity can be maintained at very high densities, ranging from 100 gigabits per square inch to tens of terabits per square inch.

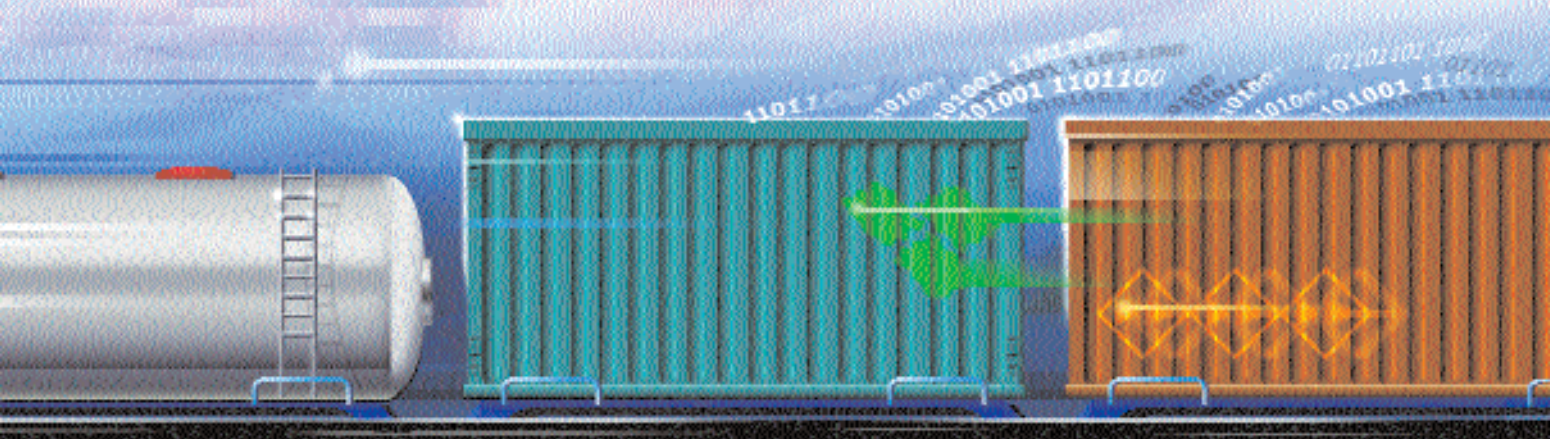
Patterned media refers to ultra-high density magnetic storage media consisting of arrays of discrete, lithographically patterned magnetic elements, each of which can store one bit of data. Each discrete element is isolated from other elements, but inside each one, polycrystalline grains are strongly coupled, behaving more like a larger, single magnetic grain. Because the SPE limit applies to the entire bit, not to each of the grains, the single bit in patterned media can be much larger than the one in conventional media. The problem with patterned media is that there are no cheap mass-manufacturing procedures.

Probe storage: IBM's Millipede

The tip at the end of a cantilever makes for the ultimate in local confinement of interaction. This makes tip-based storage technologies natural candidates for extending the physical limits being approached by conventional magnetic storage. Probe storage technology makes indentations 10 nm (nano metres) in diameter on a plastic film. Each indentation is a bit, which can be heated back to its original shape. Thousands of tiny probes—tips at the end of a cantilever—move back and forth over the film. Because of the many probes ('feet'), IBM's codename for this technology is 'Millipede'. There are problems inherent in this idea, and IBM's solution was to use micro-electro-mechanical systems (MEMS)-based arrays of cantilevers operating in parallel, with each cantilever performing write, read and erase operations in an individual storage field. Probe storage is expected to use just about as much power as a flash card, but store up to 100 times as many bits as traditional disks.

Flash memory

Companies need to keep shrinking Flash memory as portable devices get smaller—cell phones and digital cameras, for example. Flash sticks transfer data fast and, like hard disks, don't need to be powered on to retain data. These sticks don't have moving parts, so they're much more rugged.



It's becoming increasingly difficult for Flash memory to shrink, and therefore, to obey the exponential law. The reason hinges upon the way Flash memory works: memory cells in Flash sticks are transistors whose gates are wrapped in a layer of silicon dioxide that prevents electrons from escaping. The cell holds a one or a zero, depending on the charge in the transistor. The problem is that the silicon dioxide insulating layers are about 90 angstroms thick; and at 80 angstroms, the layer will no longer be as effective.

Although companies such as Intel agree that the issue is currently manageable, making Flash chips with a component size of 45 nm will be difficult. And the 45-nm manufacturing process is set to begin in 2007. Companies, therefore, are looking at alternatives—nanocrystals, Ferroelectric RAM (FeRAM), Magnetic Random Access Memory (MRAM), Ovonics, and polymers.

The use of nanocrystals promises to halve chip sizes by using a lattice of silicon crystals as the insulator, instead of the silicon dioxide layer. At the nanoscale, silicon behaves as an insulator. Silicon-Oxide-Nitride-Oxide-Silicon (SONOS) is another similar alternative that's being researched.

FeRAM is non-volatile, like Flash. However, it's much faster, and consumes less power. The disadvantages include lower density and higher cost. FeRAM stores data by using an electric field to shift the position of individual atoms in crystals.

Ovonics is very different from traditional electron-based storage; it induces a charge by a chemical process. After rapidly heating an alloy substrate similar to the material used in CD-RWs, dots representing ones and zeroes are created in the alloy: a one is encoded by creating a crystalline dot, and a zero is encoded by creating an amorphous dot. The bits are retrieved by measuring the change in electrical resistance between the alloy's crystalline and amorphous states. Ovonics promises to be much faster than Flash, and can be re-written many more times. The problem, currently, is that its fabrication process is expensive.

Intel and other companies are developing polymeric ferroelectric RAM (PFRAM), also known as plastic RAM. The technology involves sandwiching a thin polymer sheet between two perpendicular layers of metal strands. A memory cell is formed at the intersection of these strands, and data is stored by changing the polarisation of the polymer between the strands. PFRAM is a low-power technology. The manufacturing process is simple. And there are cost advantages too: PFRAM requires only a single layer of CMOS circuitry, and can stack up eight layers of inexpensive polymer material. The drawback is speed—read and write speeds don't compare with that of today's Flash chips. Hence, application may be limited to memory sticks.

RAM

Double Data RAM 2 (DDR2) and Graphics DDR3 (GDDR3) are already here, and you can expect to see them in desktop systems very soon. Other new and experimental technologies are on the horizon, all promising that the exponential law for RAM continues for at least a couple of decades to come. It remains to be seen whether RAM will replace the hard disk as mainstream storage.

DDR2

DDR is the current memory standard for most personal computing systems; and DDR2 DIMMs have already been manufactured. DDR2 starts where DDR left off; it's faster, and

consumes less power. The first DDR2 modules to hit the market were faster than the fastest DDR modules available now. DDR2 is not without its drawbacks, though, at least initially: it's not backward-compatible with DDR, and motherboards need to be specifically designed to support the standard. This is not a small problem; not many motherboard manufacturers have shown interest in the new standard, because of the relatively large initial price difference between DDR and DDR2. However, as an indicator of the importance of the emergence of the standard, AMD will build support for DDR2 into the Opteron's on-board memory controller, later this year.

GDDR3

GDDR3 is RAM optimised for graphics processing. It is the fastest memory available today. Speed and power are the important factors when it comes to graphics designs; GDDR3, therefore, delivers four data bits every two cycles, and consumes half the power, of graphics DDR2. The first products you can expect to see using GDDR3 chips will be high-end graphics cards.

RLDRAM

Reduced Latency DRAM (RLDRAM) features a new design that minimises the time between the beginning of the access cycle and the first appearance of the data. RLDRAM is thus all about persformance—it combines fast access due to low latency with high density and high bandwidth. The technology optimises performance for cache and networking applications. Although lower latency would certainly mean better performance for personal computers, RLDRAM is being targeted mostly at the networking equipment segment, such as routers and switches.

FCRAM

Fast Cycle RAM (FCRAM) was developed by Fujitsu in 1999. It's radical in its approach; it changes the core of the DRAM architecture, whereas other technologies have obtained speed improvements by enhancing the components that accessed the memory core. Changes to the DRAM core include core segmentation and pipelined operation. This is the first time the core of the DRAM technology has been changed, in more than twenty years. And the changes make for amazing possibilities: row and column information can be sent at the same time in FCRAM, and, because of pipelined operation, a secondary command can be issued without waiting for the primary command to be fully executed. The interface to FCRAM can be both SRAM-like, which will be used in mobile phone applications, and Single Data Rate (SDR) or DDR, which can be used in PC systems.

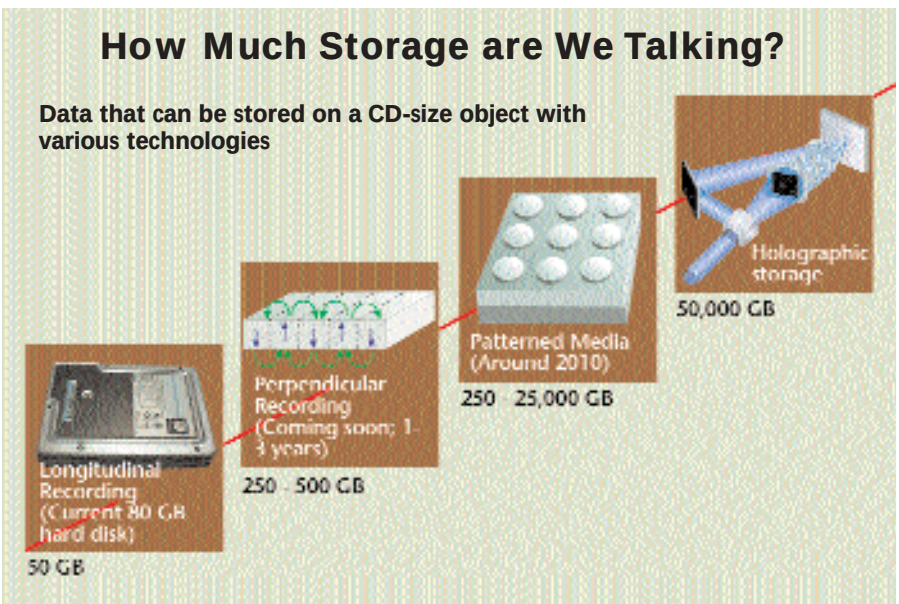
IRAM

One approach to reduce the problem of processor-memory communication delay is Intelligent RAM (IRAM)—integrating processor and memory on a single die. Of course, for the solution to be complete, memory latency needs to be reduced, too. Currently, IRAM products are not commercially available; however,

Futuristic Storage Material

Researchers at Princeton University and Hewlett-Packard Laboratories have constructed a low-cost storage device that combines the properties of solid-state silicon memory devices and plastic storage devices. It consists of thin-film silicon, covered with a conductive polymer coating that's been dubbed Pedot. This combination can potentially store one hundred megabits per square centimetre. Pedot is conductive only at low voltages, and permanently loses its conductivity when exposed to higher voltages. As a result, squares of conducting and non-conducting Pedot can be ones and zeroes. A memory card constructed using this method would have no moving parts, and would be like ROM—writable once, and readable many times. According to the researchers at Princeton and HP, the memory cards could be commercially viable in five years.

Researchers now say that hybrid organic-semiconductor memory could become viable in as little as two years. One possibility is to use layers of molecules as bits, with the challenge being to find molecules that can withstand high temperatures and other harsh conditions typical of the silicon manufacturing process, as well as the process of writing and re-writing data. Researchers from the University of California have shown that a type of 'porphyrin' molecule holds up under temperatures as high as 400 degrees Celsius, even after being written to and read from trillions of times. The molecule can be used to store charge, so charged and uncharged molecules can be ones and zeroes. It has also been shown that one memory element—a group of molecules—can store two or three bits, instead of one. As a result, current 0.13 micron memory chips would be able to store as many bits as chips fabricated using the 0.09 or 0.07 micron processes of the future.



www.ddr2.org
The Web site for DDR2 news, technology updates, white papers, press releases, etc.

http://www.seagate.com/newsinfo/technology/research/D4b1.html
A Web site about the Seagate Research centre, and its activities; Seagate is at the cutting edge of storage technologies.

http://www.storagesearch.com/ssd.html
News about solid-state storage devices; includes articles and links to company Web sites.

http://www.pcguide.com/ref/hdd/op/heads/
An interesting Web site about hard disk heads; Contains both basic as well as advanced information.

http://uk.computers.toshiba-europe.com/cgi-bin/ToshibaCSG/future_techs. jsp?z=64&service=UK
This page has links to lots of storage technology articles, from RAID to DVD and emerging technologies.

http://www.inphase-technologies.com/technology/
Read about holographic storage technology in detail.

several university and company research labs are working on IRAM architectures.

MRAM

Magnetic Random Access Memory (MRAM) is non-volatile, like Flash. It holds promise because, when designs are complete, it can combine the high speeds of SRAM, the capacities of DRAM, and the non-volatile nature of Flash. In an MRAM chip, the memory cells are the intersections of the rows and columns. Electric signals polarise the cells into ones and zeroes. MRAM is like a Flash stick—there are no moving parts; besides, power consumption is lower. It's therefore likely that MRAM and Flash will compete in the portable-device arena. MRAM has the edge because it will prolong battery life. As mainstream storage, MRAM chips are unlikely to hit the market anytime soon. IBM, however, is working on a combination of MRAM and holographic memory.

Looking forth

With so many materials and techniques being explored, one can't assume that storage will always be magnetic disks, or that memory will always be dynamic RAM. Systems of the future may build upon the concepts that exist today, or they may employ entirely new technologies such as holographic memory, or they may even bring back old ideas. Is tape the storage of the future? It is, according to Pat Martin, CEO of StorageTek! Predictions vary.

But we can be sure of a few things—for example, perpendicular recording will happen very soon; MRAM will be researched more aggressively, because of its promise as a replacement for Flash as well as becoming a PC RAM solution, etc.

Whatever happens in the future, we're quite far off from the day you'll be able to buy a computing system and live with it happily ever after—sans upgrades.

RAM MOHAN RAO
ram_mohan@thinkdigit.com

Samsung HT-DB390 Wireless Home Theatre In-a-Box ▶▶

A box office hit

With Bluetooth being the flavour of the season, can home theatres be far behind? Introducing the Samsung HT-DB390, which has a DVD player and can play most compressed audio formats, as well as display still images. It's Dolby Digital, Dolby Pro Logic II and DTS certified, and yields 400 W of power from its 5.1-channel setup.

Price: US$ 499.99

UnWire My Sphere

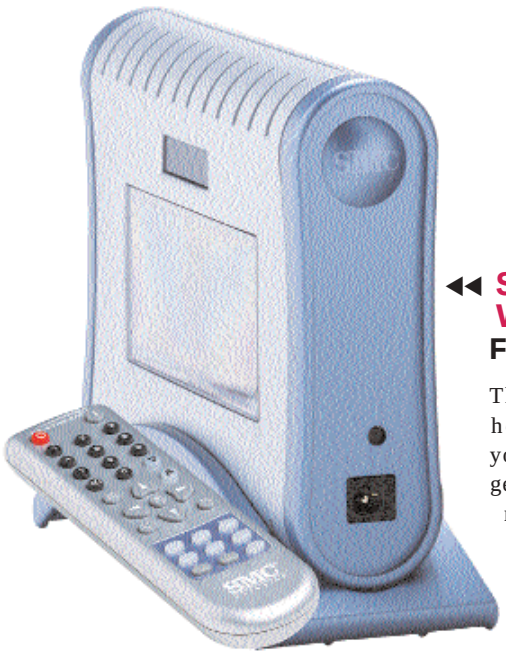
Who needs clunky, knotty cables, when you can have these!

D-Link DSM-320R Wireless Media Player with Flash Reader ▶▶

Shindig streams

The D-Link DSM-320R wireless media player can stream images from AOL's online photo gallery, video, audio and Internet radio from your wireless home PC network onto your idiotbox. It supports most popular audio and video formats, and five different memory cards—Compact Flash (CF), Smart Media (SM), Secure Digital (SD), Memory Stick and MultiMedia Card (MMC).

Price: US$ 129 (approx)



◀◀ SMCWAA-B EZ-Stream 11 Mbps Wireless Audio Adapter

Fine-tuning harmony

The SMCWAA-B EZ-Stream seamlessly integrates into your 802.11b and g Wi-Fi home network, and connects it to your entertainment centre. Stream music from your PC and listen to it using headphones or a surround-sound system. And if you get bored of your collection, switch to Internet radio. The LCD display helps you navigate your music collection.

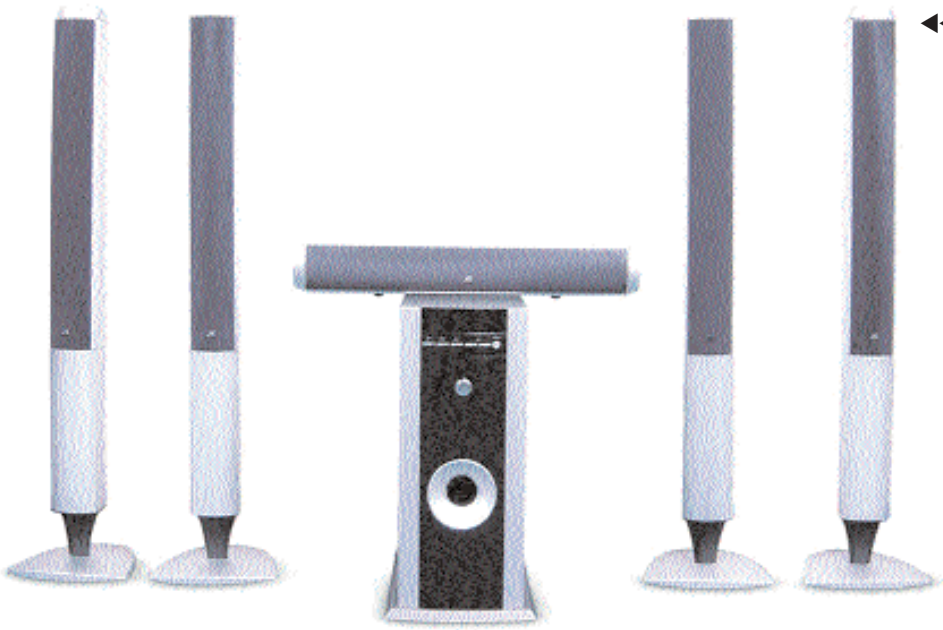
Price: NA

NETGEAR MP101 Wireless Digital Music Player

For your musicale

Turn on the NETGEAR MP101, and prance around your home. Wi-Fi encryption is built with support for Wired Equivalent Privacy (WEP), letting you groove to your MP3s and WMAs anywhere within a given area. The supplied software automatically creates a database of your music. To navigate, use the display or the remote control.

Price: US$ 159.99

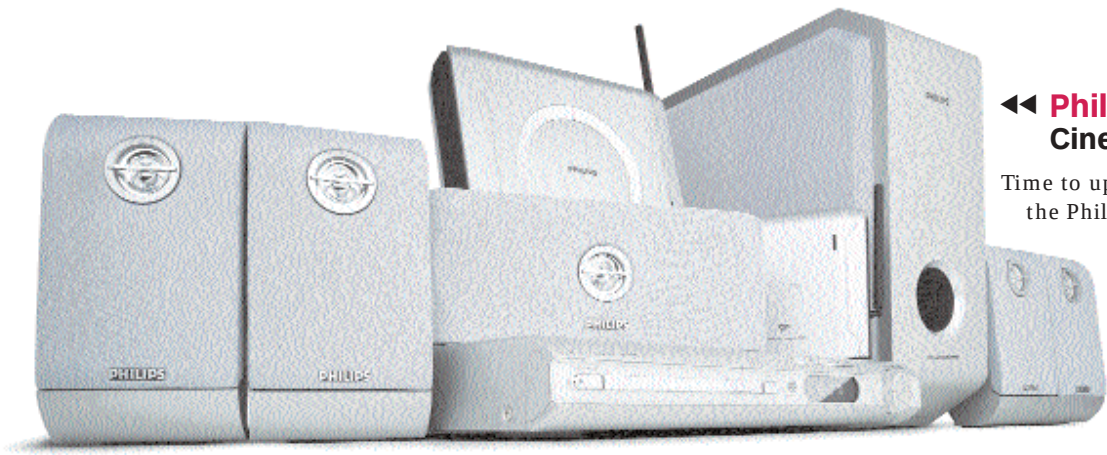


Jazz Hipster Wireless Home Theatre J9618B

Maudlin beauties

With a name like this, everything else seems a let down! Yet, the Jazz Hipster impresses you by working at the 2.4 GHz frequency band and yields 280 W of power through its aircraft-grade (nothing less!), aluminium cabinets. It has dual 8-inch woofers rated at 120 W, and front, centre and rear speakers with two-way drivers. Shielded against magnetic interference and other RF equipment, it has a re-chargeable battery and a remote control.

Price: NA



Philips LX3950W

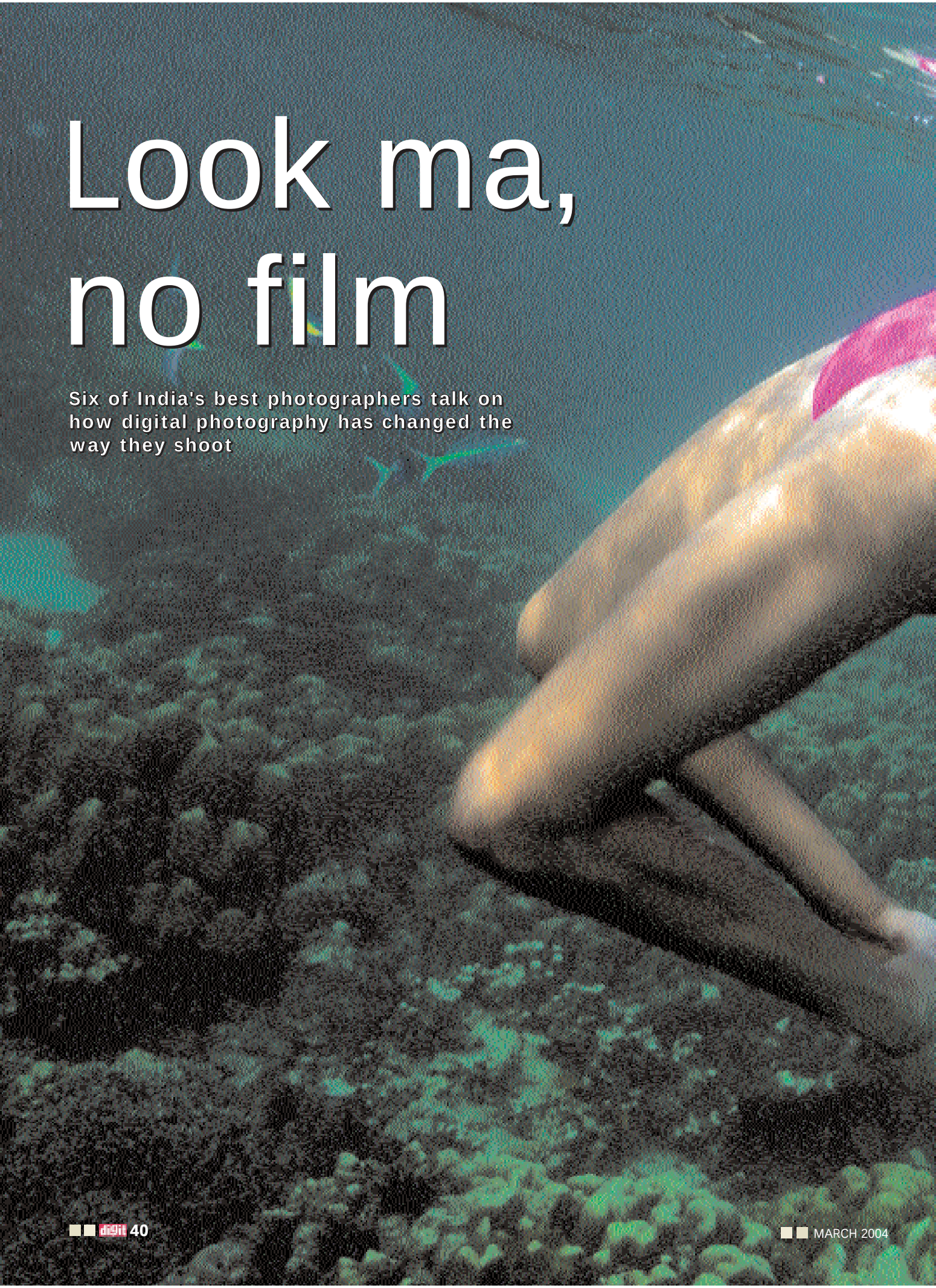
Cine in style

Time to upgrade you home theatre to the Philips LX3950W: This instalment of the DVD home theatre has Dolby Digital 5.1 and Dolby ProLogic II. You can playback all your DVDs, as well as Super Audio CDs.

Price: US$ 399 (approx)

Look ma, no film

Six of India's best photographers talk on how digital photography has changed the way they shoot



Courtesy: Atul Kasbekar

"Fashion photographers today can't live without digital techniques"

Who: Atul Kasbekar
Field: Fashion, advertising, personalities
His camera: Fuji S2 Pro: 6.17 megapixels, maximum image size 3,024 x 2,016 pixels, sensitivity ISO equivalency 100 to 1,600, can shoot up to 7 frames per second, Firewire and USB 1.1 dual interface
Price: Rs 1.65 lakh

Usage: Occasionally, but will move to full-time digital photography this year.
These pictures, in his words: I shot these two for the Kingfisher Swimsuit calendar, and here a digital camera was a must. Underwater photography fascinates me because the light fades quite fast, and the surface creates a mirror effect. Digital photography enhanced these effects.
Oh, we didn't know: Suppose you need three elements in one photo—the model's hair flying, her shining face and a mirror. With a traditional camera, this one is a tough task—all three elements just won't gel simultaneously. I would have to shoot lots of pictures before I get the perfect shot. With digital cameras, these problems can be overcome faster.
Frustrations: I shoot really fast. But a digital camera hangs for some time after seven to eight pictures as it takes time to write the images to the memory card. Since I shoot images in high resolutions, this problem becomes worse.

Who: Mukesh Parpiani
Field: News (Parpiani is the photo-editor of Mid Day, a Mumbai newspaper)
His camera: Nikon 1DX: 5.3 megapixels, maximum image size 3,008 x 1,960 pixels, 2-inch LCD, sensitivity ISO equivalency 125 to 800
Price: Rs 2.9 lakh

"Digital cameras can give you perfect colour balance"

Usage: Everyday. Moved to digital photography a year ago.
This picture, in his words: Kuala Lumpur's (Malaysia) Petronas Twin Towers are not only beautiful to look at, they are also supremely photogenic. Here, you see the perfect colour balance between the building and the leaves in the foreground. This can be achieved with ease only with digital cameras.
Oh, we didn't know: For photo-journalists, digital photography is a boon. Shooting pictures, and then filing them fast was a Herculean task. To send pictures before e-mail happened, we had to rush to the telegraph office. Now, newspapers have the latest pictures because shooting and filing them has become so easy. The cost has also come down drastically.
Recommendations: I suppose every enthusiast should opt for a digital camera. Go in for the cheaper brands, if there are budget constraints.

Courtesy: Associated Press

"Combine digital cameras with cell phones... and time is not an issue"

Who: Aijaz Rahi
Field: News and current affairs (South Asia photographer for Associated Press)
His camera: Nikon 1DX: 5.3 megapixels, maximum image size of 3,008 x 1,960 pixels, 2-inch LCD, sensitivity ISO equivalency 125 to 800
Price: Rs 2.9 lakh

Usage: Everyday. Swears by digital photography. Moved to digital photography in 1998 and was one of India's early adopters.
This picture, in his words: The Gateway of India blast in Mumbai redefined new-age terrorism in India. For a news photographer, there are no second chances in such cases. Here, a policeman is surveying a car damaged in the blast that killed 40 people.
Oh, we didn't know: Working for a news-wire service is one of the most demanding jobs in journalism. Since our revenue depends on our clients, and they buy only those pictures that came first, speed is the most important factor. Now, combine digital cameras with cell phones or satellite phones, and time is not an issue anymore.
Memories: In the US-Afghan war, I had to rush to a remote place where a bus carrying children was bombed. I was the only wire photographer there, and if not for my digital camera and satellite phone, covering the calamity would have been impossible.

"I found the moment here... because of the high shutter speed"

Who: Atul Kamble
Field: Freelance sports photographer (The Hindu, Sportstar, Mid Day)
His camera: Nikon D100: 6.1 megapixels, maximum image size 3,008 x 2,000 pixels, 1.8-inch LCD, top shutter speed 1/4,000 seconds
Price: Rs 1.2 lakh

Usage: Everyday. Is a devotee of digital photography.
This picture, in his words: I shot this picture during a local school boxing tournament in Mumbai in 2003. Any sports photographer is concerned with only the 'moment'. I found the moment here, but to get it, I had to wait for a long time. But because of the high shutter speed, I could get the moment I was looking for. Moreover, I could see the result immediately, and not wait in suspense until I reached my dark room.
Oh, we didn't know: Digital cameras allow you to experiment a lot, something that is a no-no with traditional cameras, where the cost of experimentation is extremely high.
Next step: I would want to upgrade to a higher-end model such as the Nikon D1X. And then, like any sports photographer, would like to experiment much more than what I am doing right now.

"Digital cameras allow you to experiment and learn fast"

Courtesy: Outlook

Who: Atul Loke (Senior photographer, Outlook)
Field: News, personalities, travel, sports (occasionally)
Uses: Nikon D100: 6.1 megapixels, maximum image size 3,008 x 2,000 pixels, 1.8-inch LCD, top shutter speed 1/4,000 seconds
Price: Rs 1.2 lakh

Usage: Occasional, but will switch to full-time use in the next two months.
This picture, in his words: During the Cricket World Cup 2003 in South Africa, actress and presenter, Mandira Bedi, had become as popular as the Indian team. She was bubbly and vivacious, and represented the new Indian woman. I had to shoot her doing something that would reflect her personality. With a digital camera, getting that right picture was not tough at all.
Oh, we didn't know: Digital cameras allow you to learn photography fast. You can experiment a lot with your camera. With film cameras, that is not the case. You have to note down every setting you used, so that you can cross check later when the photos are finally developed.
Impact: Until recently, I had to hire digital cameras. Companies have realised the benefits of digital photography and have provided photographers with digital cameras.

"In two years, digital cameras will be ubiquitous"

Who: Fawzan Hussain
Field: News, current affairs, travel, personalities (Principal photographer, India Today)
Uses: Nikon D100: 6.1 megapixels, maximum image size 3,008 x 2,000 pixels, 1.8-inch LCD, top shutter speed 1/4,000 seconds
Price: Rs 1.2 lakh

Usage: Newly acquired camera, will switch to full-time use in March.
This picture, in his words: I was in the Maldives in the Indian Ocean recently on assignment. Maldives probably has the most beautiful beaches in the world. As I was strolling past one day after shooting a few pictures, I spotted this girl who was playing on the beach. It did not take me long to take this picture. The digital camera allowed me to take lots of shots before finally pinning this one down.
Oh, we didn't know: A professional photographer these days has to have a digital camera. It saves time, and affords a lot of flexibility. The penetration of digital cameras will only increase. I guess, in two years, digital cameras will be ubiquitous.
Benefits: With a digital camera, you don't have to wait for film to be developed before you can see the image, making it ideal for news photography.

How we Test

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

To ensure that our readers have all the information they need to make an informed buying decision, reviewers at the Digit Test Centre conduct comprehensive tests to evaluate the latest hardware, software and technology services in accordance with international standard evaluation processes and methodologies.

Our test results may be presented either as Comparison Tests, or as individual reviews in the Bazaar section. The representation of the results is different for each in the interests of clarity, but the test process for both is identical in all respects.

Of all the products we test, only the best make it to the A-List.

Comparison Tests

In the comparison tests, we compare the performance of products within a particular category. Each product is evaluated under different parameters such as performance, value for money, features, ergonomics, 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 scores for features, ergonomics and performance for each individual product. A detailed test process is included with each comparison test, and explains the parameters that were taken into consideration, along with weightage allocation and reasons for the same.

In Bazaar

The evaluation of products in Bazaar also covers the same parameters such as performance, ease of use, value for money, build quality and features of the product.

Here, each of these parameters 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 a value for money score of five arrows signifies an outstanding buy.

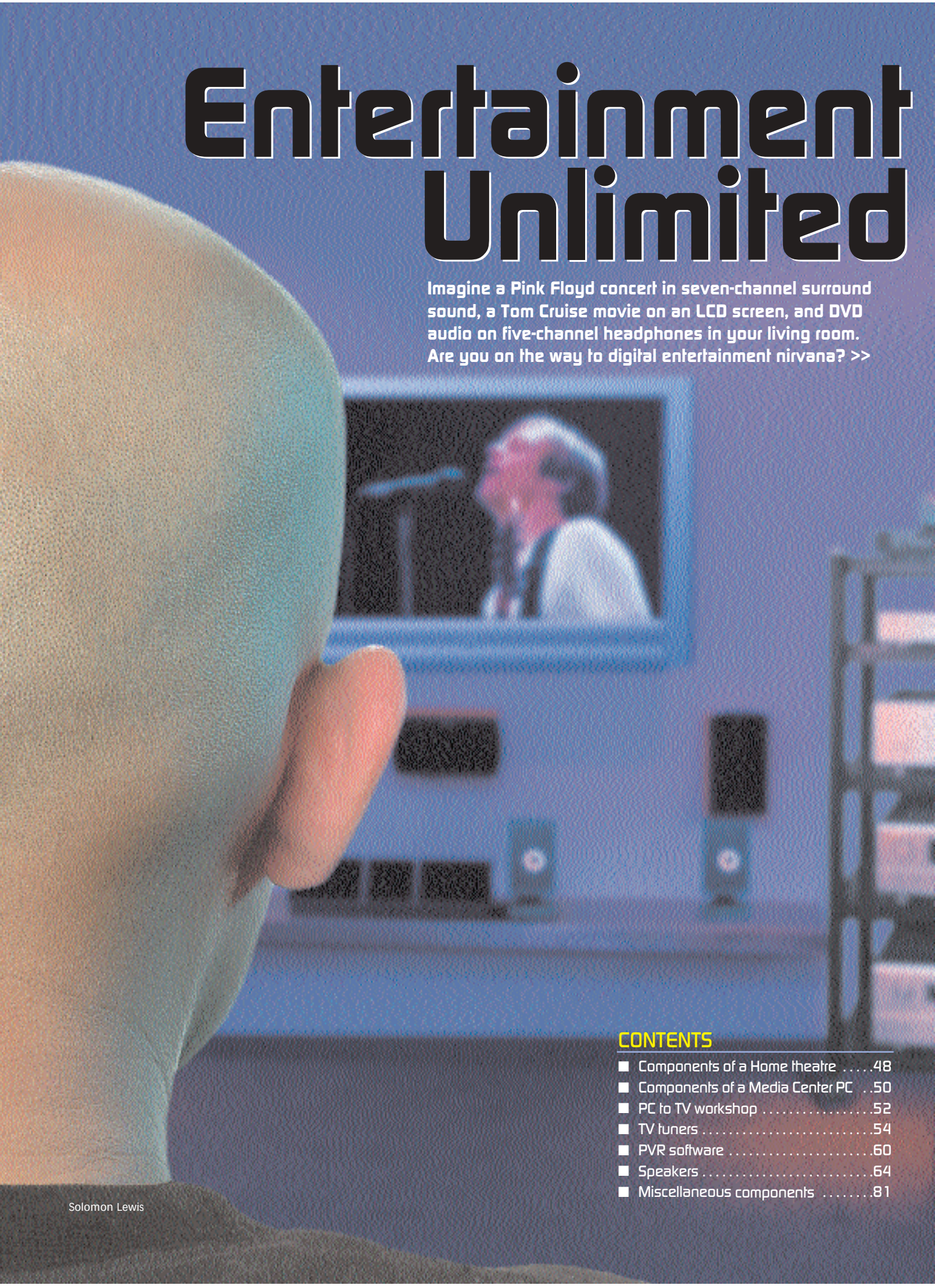
The Awards

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 combined with rest of the package including features, ergonomics, bundled accessories etc. This award represents the best performing product in our tests in terms of the complete package that is offered to a customer. 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 ergonomics, performance and features to its price. The product winning this award offers a good combination of performance and features at a great price. Since value for money takes into account all scores for all parameters including the price, this score will be used to arrive at a grade (e.g. A+) for each product.

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

Entertainment Unlimited

Imagine a Pink Floyd concert in seven-channel surround sound, a Tom Cruise movie on an LCD screen, and DVD audio on five-channel headphones in your living room. Are you on the way to digital entertainment nirvana? >>



Solomon Lewis

CONTENTS

>> What Makes a Home Theatre

1 **Media Center PC:** This is the hub of all your computing activities. Since it has an inbuilt TV tuner, you can watch TV on your PC, which can be re-directed to your wide-screen plasma TV display. Use the one-touch remote to control all functions such as playing TV, FM-radio etc, and also capture programs.

2 **Display:** An important component of a home-theatre setup. It can be your CRT or LCD monitor, hooked up to the Media Center PC, or a regular TV. You can also opt for a High Definition TV (HDTV), a rear-projection TV, or a plasma TV display for better experience.

3 **Speakers:** Those thumps, booms and clinks need sound to be as life-like as possible. You can choose from a wide range of speakers, ranging from normal stereo speakers, 2.1s, to 7.1 systems for a surround-sound experience.

4 **DVD player:** The Media Center PC comes with a DVD drive. However, if you love lining your DVDs one after the other, then a five-disc DVD changer is what you need.

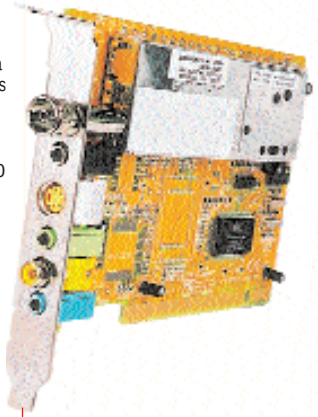
5 **Wireless peripherals:** All the devices mentioned above come with their own remotes. So when you sit down to watch a movie, you will have at least four remotes in your hand. Doesn't leave much room for the popcorn now, does it? The universal remote is what you need.

An upgrade would be the learning remote that has an LCD display, does everything what the universal remote does, and also learns the patterns in which you use your remote. Oh, let's not forget the wireless keyboard and mouse that controls the Media Center PC. After all, you're not going to be watching movies all the time.

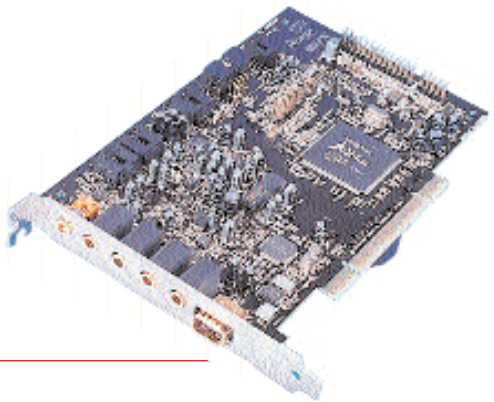
Mexy Xavier

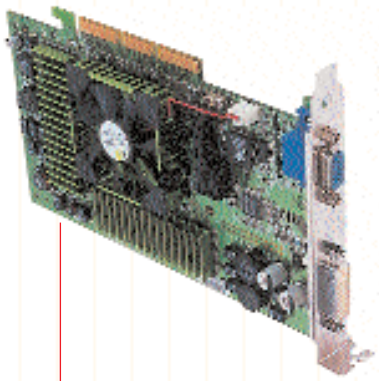
>> Deconstructing your PC TV

TV tuner: This is probably the most important component you need to get your favourite channel on the PC. Ideally, a card with hardware MPEG-2 compression is recommended, but keeping in mind the price factor, a card without hardware compression will fulfil the need, but if your processor's fast enough. The cost? Rs 2,000 to Rs 4,500.

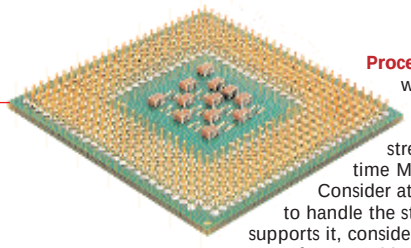


Sound Card: A good sound card completes a home-surround system. A good one shouldn't cost you more than Rs 3,000.

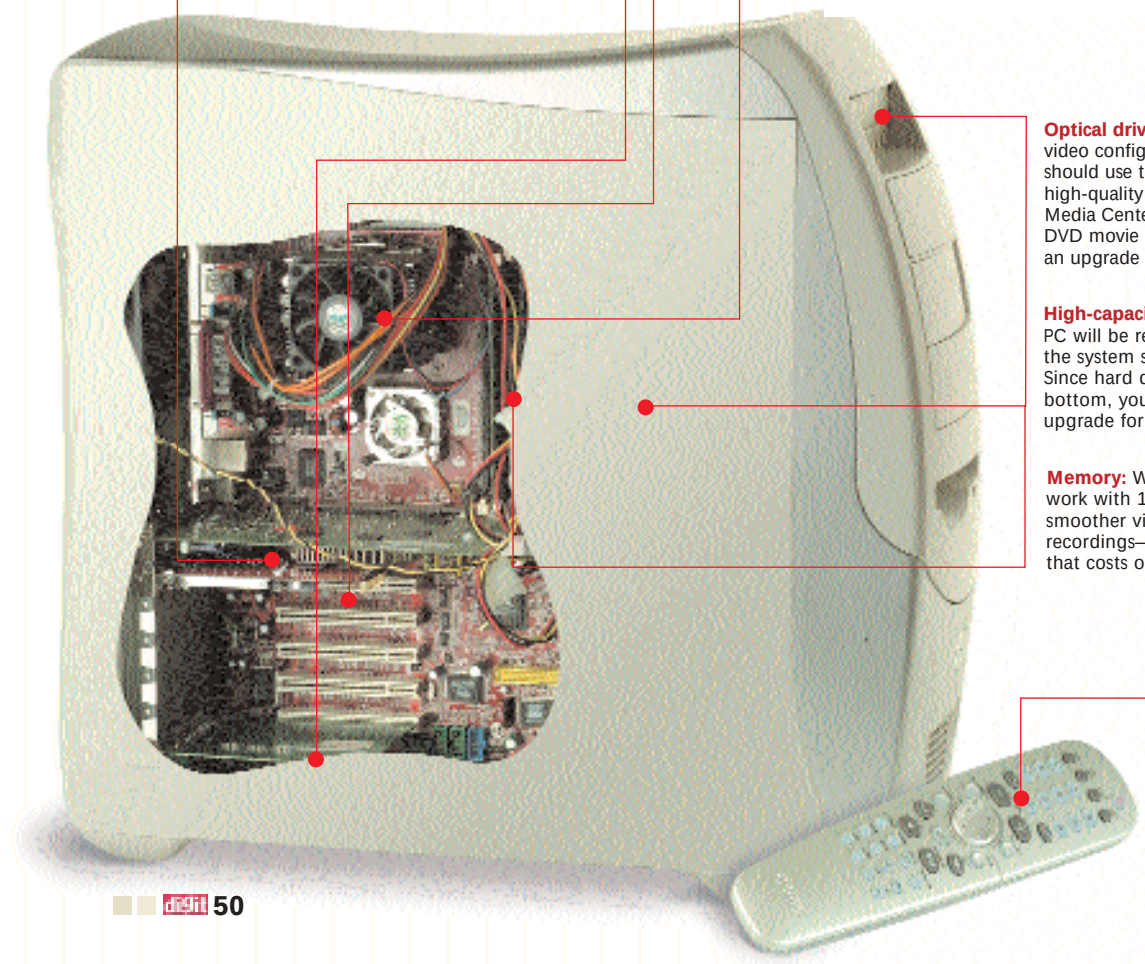




Graphics card: For a video card that shows full-screen video in true colour, any modern graphics card should do. If you need to upgrade, a Rs 2,500-solution will set you on the path to gorgeous graphics.



Processor: A Media Center PC will work on a 300 MHz processor, but won't be able to cope with the stress generated due to real-time MPEG compression. Consider at least a 1 GHz processor to handle the stress. If your motherboard supports it, consider moving to a 2 GHz processor for Rs 4,500.



Optical drive: With a well-configured audio and video configuration, it stands to reason that you should use the best-quality recorded media. While high-quality DivX and VCDs look great on your Media Center PC, nothing beats the quality of a DVD movie with multi-channel sound. Consider an upgrade to a DVD-combo drive for Rs 3,500.

High-capacity storage: As your Media Center PC will be recording your favourite shows daily, the system should have enough storage space. Since hard disk prices have reached rock bottom, you can consider at least an 80 GB upgrade for Rs 5,000.

Memory: While Windows XP is rumoured to work with 128 MB RAM, 256 MB guarantees smoother video playback and less stressful recordings—a significant boost in performance that costs only Rs 1,000.

Remote Control: Ever thought of a TV without a remote control? Then why should things be different here? Make sure your TV tuner comes bundled with a couch potato's best friend.

HCL Beanstalk AQ265 Media Center

The infotainer

Encased in a cubic chassis, the AQ265 runs the Media Center Edition of Windows XP, and offers a complete home entertainment solution in a single package.

Powered by Intel P4 2.6 GHz, 256 MB DDRRAM, 845GE, 128 MB nVidia GeForce 5200 AGP card, combo drive, 15-inch LCD screen, Altec Lansing ATP3 2.1 speakers and an 80 GB hard drive that's enough to store approximately 80,000 minutes of music in 128 KB lame MP3 format, or approximately 120 hours of video in MPEG-1 format. Armed with an onboard MPEG2 encoder and an FM tuner, the internal Hauppauge TV-tuner card provides media functionality.

Other package contents include gamepad, internal fax modem, etc. It also bundles along Windows XP Media Center Edition and Norton AntiVirus.

On the performance front, it put forth its best foot in some areas, but did not do well in the others. For example, the poor SiSoft Sandra disk index indicated a poor hard drive system. This was also reflected in the Content Creation and Business Winstone tests that logged 18 and 17.3 respectively. Collectively, it implies that it's an average PC for business users.

However, on the gaming front, it was an entirely different story. It pitched in 259 fps at 640 x 480 for *Quake III* and 129.82 (flyby) at the same resolution in the case of *UT 2003*—these indicate that it does well in performance. It came out with brilliant scores in the video-encoding test too, thus showing itself worthy of its job. As far as the actual recording format is concerned, you have four options—fair, good, better, or best.

The big, bold font used in the Media Center interface lets you read text from as far as 10 feet from the screen. Use the neat and clean remote control interface to navigate throughout the software without the slightest bit of strain. And you'll hardly exert yourself configuring it.

Features-wise, it has time-shifting TV, advertisement-skipping, scheduled recording and instant replay of 10 seconds. While scheduling, recordings may overlap then you can manually resolve this conflict, or set the software to do so automatically.

The Media Center software also helps you link a series of episodes. It provides you options to keep the recorded file until space needed. It also lets you specify whether you wish to keep the recorded file for one week or until you have watched the recording. Thus, it lets you manage your recorded files and do away with recordings that are not necessary. Management functionality is provided for music as well as image files.

If you find the price tag to be on the higher side, opt for a slightly low-end model. Featuring a 17-inch flat CRT display, 40 GB hard drive and a P4 2.5 GHz processor, it's priced at Rs 50,000.

In all, the Beanstalk AQ265 has all the components of basic capture software, along with advanced features such as Instant Replay, Play/Pause Live TV, etc, which makes TV-viewing more thrilling.

Capturing video, listening to FM or music, is all just a mouse click away, thanks to the easy to use software interface

Price: Rs 74,999
Company: HCL Infosystems Ltd
Tel: 0120-2520977
E-mail: response@hclinsys.com
Web site: www.hclinfosystems.com

This media center PC enables you to watch TV as well as tune in to your favorite FM channel all with a click on the remote

From PC to TV in 12 Steps

If you have a decently configured PC with good speakers and a DVD drive, converting it to serve as a media entertainment centre is a simple matter of installing a good TV tuner card and the appropriate software.

All you need to do is plug the TV tuner card, install the drivers and software, connect the cable to the card and scan for channels. You can also prioritise and name channels as you please. Of course, the installation and configuration does take a while, but nothing beats having a personal TV in your room!

STEP 1 As this project requires setting up both hardware and software, the first step consists opening the cabinet, finding a suitable free PCI slot and inserting the TV tuner card—in our case the Compro VideoMate TV Gold+. Once the card is attached, start the computer.

STEP 2 As soon as you start the computer, the operating system will display a message saying "Multimedia Controller Found".

If you view the device manager at this moment, you will find a number of devices marked with question marks or exclamations. You will be asked to insert the driver CD to continue installing the drivers—insert the CD provided by the manufacturer, and press Next.

STEP 3 Windows will try to search for the drivers from the CD-ROM drive, and then list all the suitable ones. If the list shows more than one, then choose the right one, according to the OS installed. Select the driver, and press Next again.

Windows may show a warning pop-up saying that the drivers are not digitally signed, this means that Microsoft hasn't approved the driver, but it's generally alright to go ahead and continue the driver installation. If you face a problem later, you can use system restore, and roll back the drivers in Windows XP. When you press Next, the driver installation process begins. Once it's done, press Finish to complete installation.

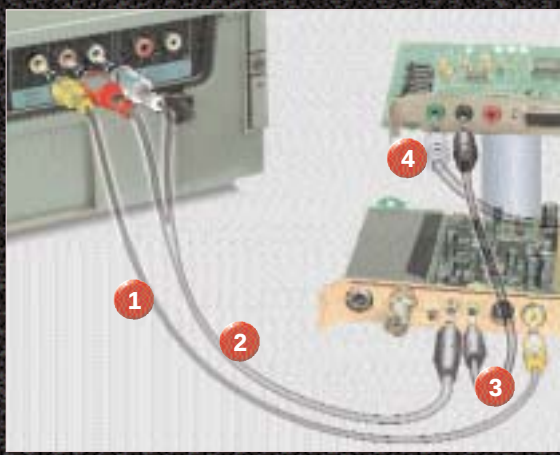
STEP 4 If you check the device manager, you'll see that due to the add-on drivers that are needed, the list of devices with question marks and exclamations has increased. Windows should remedy this automatically, but if it asks for the driver CD, repeat the previous step.

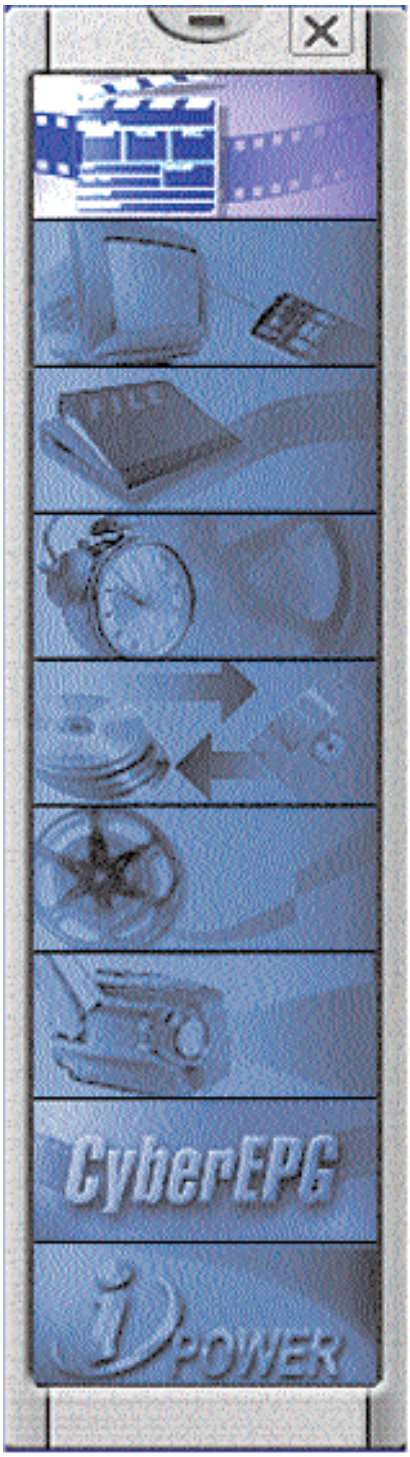
Once the process is completed, all the unknown devices will have vanished, and the list in 'Sound, Video and game controllers' will display the new set of hardware installed.

STEP 5 Now, we go back to the hardware level, to do the wiring properly. To capture TV signals, connect the TV cable to the tuner card.

To get a video signal via composite, connect the Audio Out of the Video player to the Audio In jack, and connect the composite out jack of the player to the Composite In of the tuner card.

If your card does not have Audio In, you need to connect the Audio Out of the video player to





Key to buttons

1 

By clicking this button, you can change the video source from TV to S-Video, or Composite

2 

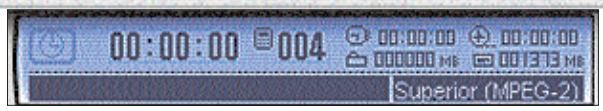
The nail and hammer symbol opens the settings window, where by you change the different parameters.

3 

Click this button to take snapshots of your favourite TV moments

4 

These panels represent the normal TV functionaility, while in time-shifting mode. The same enables you to Pause/Resume Live TV signals.

5 

In this screen, you can observe lots of useful information such as the compression format used currently, the size of the recording file, as well as the amount of time that can still be recorded with the current free space. Finally, in time-shifting mode, it shows two time intervals—one in the extreme top-right corner with the live signal timing, and the other in the centre showing the point where the user paused.

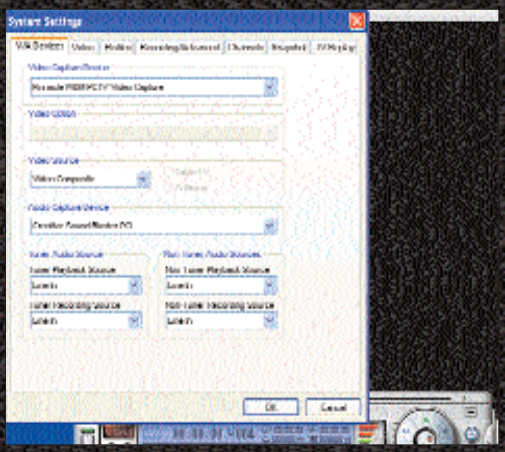
the Line In of the sound card. If it has Audio In, connect the Audio Out of player to it; connect the Composite Out of the video player to the Composite In of the tuner. Now, using a small male-male stereo cable, connect the Audio Out of the tuner card to the Mic In of the sound card.

STEP 6 Now that you've installed the hardware and drivers, you're ready to install the capture software—we used PowerVCR. When installing PowerVCR, you're asked to specify a program directory and a working directory where all the recorded video will be stored. You are also asked whether you want to back up your system files, or just install the software; choose to back up the files, as this will help you revert to your system's previous state if you want to uninstall the software. All the necessary codecs are also installed. Restart the machine once you're done installing.

STEP 7 The very first thing you have to do is configure the channels. As soon as you start the software, you're asked to do this. The lazy way out is to press the Auto Scan option, and let the software set the channels automatically. You will, however, need to fine-tune a bit here and there to get optimum picture and sound quality. You can also spend a little time naming the channels, but remember that these names are stored in the software. So, if your cable operator changes the frequencies of the channels, you're going to have wrongly labelled channels—a predicament that we all endure with TVs, when our favourite channel is changed from the easily accessible channel number 1 to number 104.

STEP 8 Now you need to configure some of the other parameters depending upon your needs. Click on the button with the nail and hammer image—you will see a list of tabs, each showing a list of parameters to be configured.

The first tab is V/A devices, where you can set the proper Video/Audio parameters such as video capture device, audio capture device, video source, audio source, etc. In this case, the video and audio capture devices are the TV tuner card itself. If your TV tuner card does not have Audio In, remember that the audio capture device has to be set as your sound card.



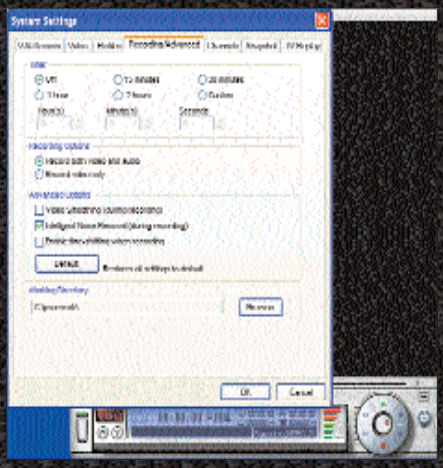
Selecting the video and audio device, as well as the video and audio input, is critical to proper viewing and recording

You also need to specify the signal source as TV, S-Video, or Composite. This will be TV mostly, and when you want to connect a video player, change this to Composite or S-Video. You also need to set the Audio Input to Mic In.

STEP 9 In the Video tab, set the actual video adjustment options such as brightness, hue, contrast, sharpness and saturation.

STEP 10 The software supports profiles for capture formats, so this step involves selecting the appropriate one in the Profiles tab. You have a wide variety to choose from—PAL, NTSC, MPEG-1, MPEG-2, etc.

STEP 11 The next tab deals with configuring the default options that you need for recording, say, the time, and some advance options such as Noise Removal, Video Smoothing, etc.



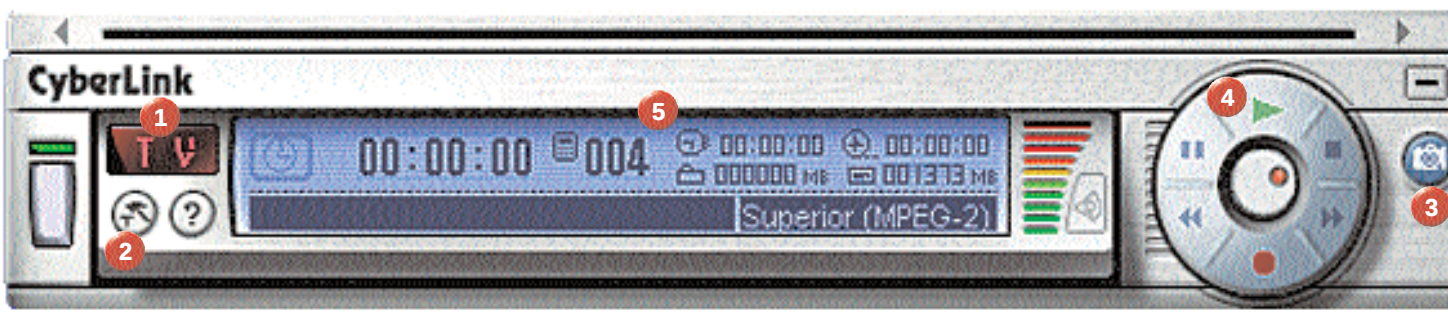
If you find that the video-quality is poor, tweak the advanced options. Observe what each change does to the video in order to get the perfect setting

STEP 12 In the Snapshot tab, specify which folder to save the snapshot images you take. The last tab, TV Replay, lets you configure the Replay Buffer Time Limit that decides how much the software caches to show you when you demand an Instant Replay.

Draw the curtains, hang the 'Don't Disturb' sign on the door, put up your feet and tune into your favourite show.

Once you're done connecting everything, it should look like the figure on the left.

1. *Composite Out (TV) connects to Composite In (TV Tuner).*
2. *Audio Out (TV) connects to Audio In (TV Tuner).*
3. *Audio Out (TV Tuner) connects to Audio In (soundcard).*
4. *Audio Out (soundcard) connects to the speakers.*



Don't you wish life had a rewind or instant replay function? Have you ever thought of killing your boss, burning your company, divorcing your significant other, sending your kids to boarding school, moving out from home, or just becoming a recluse? All because you missed that one program on TV that you'd waited forever to see, and something more important came up? It happens to all of us, TV addicts or not-be it that must-see episode of *Kyunki Saas Bhi Kabhi Bahu Thi*, *Jassi Jaise Koi Nahi*, or a cricket match. But who says that's the way life has to be?

Enter, Stage Right, TV tuner cards and PVR (Personal Video Recording) software; their role used to be played by the now outdated VCR. These gadgets make sure you never miss another programme ever again—barring power failures, hurricanes, fires and acts of divinity, of course. All you need is a decent computer setup, a cable connection and decent speakers, and you can turn your PC into a media centre. Think of it as buying a second TV for the family, for as little as Rs 1,700.

As always, there are so many options. Though brands such as Hauppauge are still not available, others do the job to satisfaction. Some local brands that only let you watch TV on your monitor are available, but as usual, *yeh dil maange more*. So, we decided to look for cards that do more than just display a few channels on your PC monitor. We looked for cards that let you capture video, in real time; cards that can capture MPEG-2 on the fly; PVR software that's easy to set up, and even easier to use; software that can convert between file formats later, and anything more on the offer.

The latest breed of cards offer advanced features such as time shifting, MPEG-2 capture, FM radio, NICAM stereo capture, and more. They're connected via a PCI or USB interface, and have impressive capabilities. How impressive? Read on to find out.

TV TUNER

Though some TV tuner cards offer more than others, it doesn't necessarily make them better. We got 10 cards for our comparison from all the major players in the market including Pinnacle, PixelView, Mercury, Compro and a new entrant—Aviosys.

Package contents

Package contents are important when buying a TV tuner card. The bundled software should include Personal Video Recording (PVR) software; tried and tested utilities such as WinDVR and Cyberlink PowerVCR are the most commonly bundled software. Pinnacle stuck to their proprietary software, and bundled only the trial version of Studio 7 with both, the PCTV Plus and PCTV PRO. A toned-down version of the expensive Studio 7 software would have definitely been welcome; they offered all the necessary wires and a remote control. Pinnacle only bundled a quick start guide in the form of documentation—the manual is on the CD. The remote is handy and works well.

Aviosys only provided a quick start guide, unlike the Pixelview TV cards which came with an extensive manual and a

Suitable Alternatives

Instead of spending thousands of rupees on a TV, you can buy a TV tuner card and watch TV on your computer. If you don't want to capture content, and only want to watch TV, you can buy a set-top-box. These boxes do not connect to your PC, just to your monitor. They can't capture content, but instead, let you use your monitor as a full-fledged TV. Though some manufacturers sent a few of these in to be tested, we didn't include them in our test—they just don't fit into the PVR category. But in case you are looking, there are cheaper no-frills alternatives for watching TV on your monitor.

Compro VideoMate TV Gold Plus

A winning package

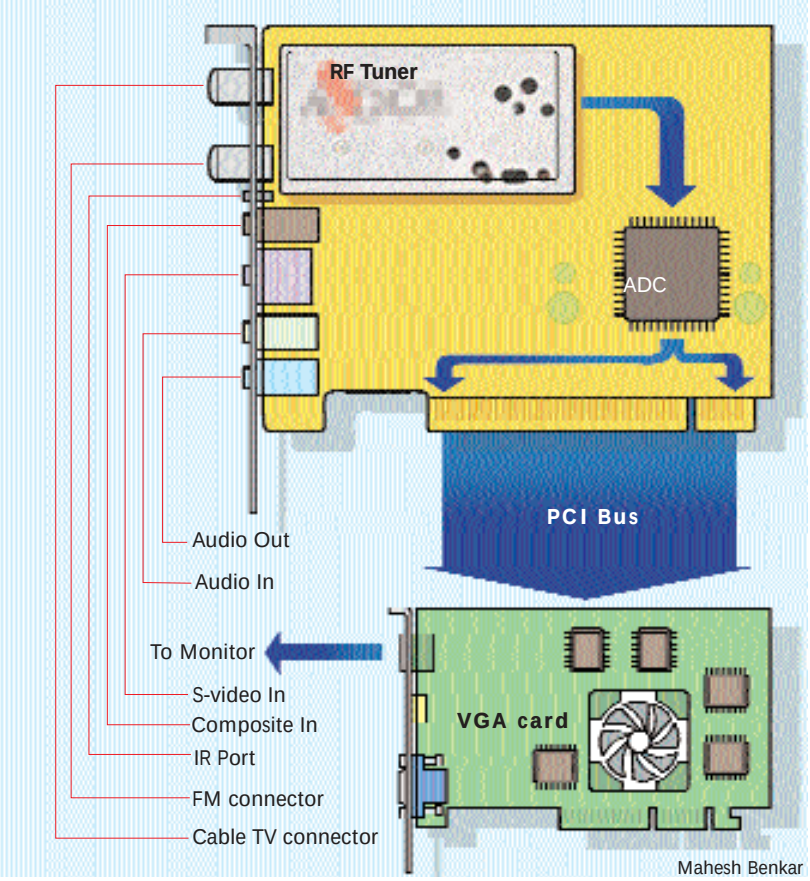
Definitely the best of the lot, this is the only card that had markings on the back panel of the Printed Circuit Board (PCB) to indicate what goes where while inserting it. The faulty drivers led to some hiccups in its configuration. The channels were not detected properly, and ran into each other with jumbled characters appearing onscreen. However, all was fine after we installed the patch downloaded from ***www.comprousa.com***. This was tedious, but definitely worth it.

The bundled software lets you write directly to DVDs. The bundled application is intuitive, easy to use and has a satchel of features. The feature to enhance the picture quality is very natty, and comes in handy while capturing content. You can take snapshots of various channels, but these look icky on a 14-inch screen. The channels are also not updated fast enough. Scheduled recording brings your system out of Standby or Hibernate mode when it's time to record. It also has an option to turn off the system after completing the job. This is useful for late-night recordings. Good software bundled with cool features made this card our performance winner.

What is a TV Tuner?

A TV-Tuner card is just another PCI card. Most cards have a very simple layout with a RF (Radio Frequency) Tuner unit and an ADC (Analog To Digital Converter) chip. The ADC chips are mostly manufactured by Brooktree (Conexant) or Philips; and most tuner units are made by Philips. The RF tuner unit is just like the one you have in your TV. The frequency of TV signals lie between 40 MHz and 300 MHz for VHF, and about 800 MHz for UHF. FM radio bandwidth is also between 88 MHz and 109 MHz, hence the name RF.

The cable wire is plugged in to the Tuner unit, where the RF signal is separated from the carrier signal and then passed to the ADC. The converter then samples this data, depending on the signal—either NTSC or PAL. The data is then passed on to the video card, where it is overlaid on the frame-buffer. This saves a lot on the system resources. However, capturing content will definitely hog system resources, and affect any other tasks you may be doing. This includes playing games, or working with multimedia applications. Working in Word or Excel, or surfing the Net while capturing content shouldn't be a problem.



Heads Up

Using a TV tuner isn't really as simple as plugging it in, loading the drivers and sitting back, and forgetting about it. There are certain precautions to be taken. While doing this test, we came across three things that you should keep an eye out for:

- Those with VIA chipset motherboards, with the onboard Savage 3D video controller, need to remember that the Savage 3D chips have an overlay problem, because the older drivers aren't DirectDraw compliant. Get a driver fix from the manufacturers Web site, or your hardware is likely to ruin your captured footage.
- RealTek ALC-650 onboard chips can distort captured sound, but help is at hand. Download the latest drivers and a patch from the RealTek Web site to fix this problem.
- Lastly, and most importantly, remember that your TV cable carries a small electrical charge along with your favourite programmess. This charge is small enough to ignore, but if it surges, you might have yourself with a fried PC. Unfortunately, there's nothing much you can do, as only your local cable guy has control over his wires. All you can do is cross your fingers, pray a lot and disconnect the cable during storms.

good remote control. Most PixelView cards had the drivers, its native application called PlayTV and Cyberlink PowerVCR on the same CD. The Pixelview PlayTV XP was the only exception—it has WinDVR and Powerdirector SE.

Compro was the best product as far as software bundles were concerned—they gave both Ulead VideoStudio and Ulead DVD Movie Factory; the Compro DVD software looks suspiciously like Cyberlink PowerDVD—it has the same configuration features. A sound editing tool would have been a welcome addition. Pixelview also supplied all the necessary wires, and the drivers and software came in one CD. Mercury needs to gather its wits on the packaging front—a detailed manual is necessary to explain the driver installation and software configuration, since they don't bundle any third-party utilities. Even the remote doesn't offer much in terms of usability, but is really sleek.

Ease of use

A product that's really easy to use is obviously more desirable. Driver and application crashes during use, reduced points here. The Pinnacle software configuration is one of the best. It can be configured easily; all we had to do was follow the instructions that the wizard gave. When a problem occurred, the wizard told us exactly what was wrong. Once the configuration is

Jargon Buster

MPEG: MPEG is a group (Moving Picture Experts Group) that develops standards for digital audio and video compression. There are several versions of this standard, including MPEG-1, MPEG-2 and MPEG-4.

MPEG-1: This standard was designed to code progressive video at a transmission rate of 1.5 Mbps. It is used in Video CDs, but is giving way to the new MPEG-2 standard. MPEG-1 Layer 3 is the audio compression format popularly known as MP3.

MPEG-2: This standard was designed to code transmission rates above 4 Mbps, and is used in DVD and digital broadcast TV. It is superior to MPEG-1 in terms of picture quality and sound clarity.

MPEG-4: This is a relatively new standard, and is aimed at converging streaming media from different sources. Speech and video synthesis, fractal geometry and an AI approach to reconstruct images with better, yet lossless, compression.

NTSC: This stands for National Television Standards Committee that developed the protocol for broadcast transmission and reception in the US. NTSC signals are used in the US and Japan, and have hardly been altered since their inception, except for the addition of new parameters for colour signals. NTSC signals are interlaced, and an NTSC TV image has 525 horizontal lines per frame. Every other line is dropped, and thus it takes two screen scans to complete one image. One complete frame is scanned every 1/30 second. NTSC signals are not directly compatible with computer systems, but there are adapters available that let you view an NTSC signal on a PC monitor.

PAL: Phase Alternation Line is the standard that is used in India and Europe. In the PAL standard, the horizontal image has 625 horizontal lines per frame. A slight colour variation is seen between the PAL and NTSC standards. This standard was developed in Germany.

SECAM: This stands for Sequential Couleur avec Memoire, and is prevalent in some parts of Europe—mainly in Russia and countries of the former Soviet Union. Similar to the PAL standard, it is an interlaced transmission signal for TV.

NICAM stereo: This stands for Near Instantaneous Companded Audio Multiplex, and was developed by the BBC Research Centre in the early 1980s. It was first transmitted with the PAL colour broadcasting system in Britain. This technology improves on the sound quality of the transmitted TV signal. The Compro and Pinnacle TV tuners feature NICAM stereo.

SCORE BOARD

CATEGORY	TV TUNER CARD					
Brand	**Aviosys**	**Compro**	**Mercury**	**Pinnacle**	**Pinnacle**	**PixelView**
Model	TV-EZ	TV Gold+	TV Tuner	PC TV Plus	PC TV PRO	PlayTV MPEG-2
Chipset	Philips 7134	Philips 7134	Philips 7130	Conexant BT878	Conexant BT878	Conexant BT878A
FEATURES 40%						
Internal / External	Internal	Internal	Internal	Internal	Internal	Internal
Video Capture formats supported (MPEG1 / MPEG2)	✔ / ✔	✔ / ✔	✔ / ✔	✔ / ✔	✔ / ✔	✔ / ✔
Additional Video Capture Device Connector	✘	✘	✘	✘	✘	✘
Colour Formats supported (YUV / YUV12 / RGB16 / 32)	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔
Maximum resolution supported	720 x 576	720 x 576	720 x 576	720 x 576	720 x 576	720 x 576
FM Tuner	✔	✔	✔	✘	✔	✔
Time-shifting software	✔	✔	✔	✔	✔	✔
TV Standards Supported (NTSC / PAL / SECAM)	✔ / ✔ / ✔	✔ / ✔ / ✔	✔ / ✔ / ✔	✔ / ✔ / ✔	✔ / ✔ / ✔	✔ / ✔ / ✔
Other features	✘	NICAM Stereo	✘	NICAM Stereo	NICAM Stereo	✘
Package Contents (15%)						
Software bundled	VCD DVD Plus, Ulead VideoStudio	Ulead DVD Movie Factory, Ulead VideoStudio, Compro Internal software	Mercury proprietary software	Pinnacle proprietary PCTV Vision, Studio 7 Trial, T-Rex Multimedia file converter	Pinnacle proprietary PCTV Vision, Studio 7 Trial, T-Rex Multimedia file converter	Cyberlink PowerVCR
Manuals / Remote Control	✔ / ✔	✔ / ✔	✔ / ✔	✔ / ✔	✔ / ✔	✔ / ✔
Ease Of Use (So5 *) (15%)						
Installation / Driver support / Configuration	4 / 4 / 4	4 / 4 / 4	3 / 3 / 3	4 / 4 / 4	4 / 4 / 4	3 / 3 / 3
PERFORMANCE 60%						
Quality Of Encoding (Dropped Frames)	0	0	3	0	0	0
Number of channels detected	78	78	60	78	78	78
Fine tuning required	✘	✔	✔	✘	✘	✘
Processor Usage (%)	21	21	22	21	21	21
Clarity of captured content / Overall Quality (So5 *)	4 / 4	4 / 4.5	2.5 / 2	4 / 4	4 / 4	3 / 3
OVERALL SCORE						
Performance	19.70	19.50	11.02	19.70	20.50	16.50
Features	58.50	62.50	46.00	55.50	61.00	53.50
Grand Total (Performance + Features)	78.20	82.00	57.02	75.20	81.50	70.00
Value for money	3.13	2.09	3.35	2.51	2.33	2.00
Price (Rs)	2,500	3,925	1,700	3,000	3,500	3,500
Grade	B+	B+	A	B	B+	B+

** Scale of 5*

done, you can start capturing content with your card. We didn't have any driver or software issues when testing these cards. Aviosys also did well—there were no configuration, or driver installation issues. The Aviosys application needs to look a whole lot better though. Don't expect to be able to plug in this card and start capturing content immediately, as learning your way around the application will take some effort.

The Pixelview cards had some major drawbacks in terms of driver support and software incompatibility. The PixelView PlayTV PRO crashed our test system till a driver update came to our rescue. The native PixelView application takes a little getting used to, but the bundled PowerVCR software more than makes up for that. The irritating bit is that you need to get the native software settings right before configuring PowerVCR. The Compro and Mercury cards also didn't work out of the box, and needed a driver update and a patch fix in order to work.

Features

All the cards supported stereo capturing, and had the S-Video and Composite input ports. Certain features, such as NICAM stereo, were only provided on the Aviosys, Compro and Pinnacle cards. The Compro card could achieve advanced tasks such as bringing the PC out of standby for a scheduled recording, and then shutting down after the recording is completed.

TV TUNER CARD

Pixelview	Pixelview	Pixelview	PixelView
PlayTV PRO	Play TV PRO Ultra	PlayTV USB PRO	PlayTV XP
Conexant BT878	Conexant Fusion878	Conexant Fusion878	Conexant Fusion878A
Internal	Internal	External	Internal
✔ / ✘	✔ / ✔	✔ / ✘	✔ / ✔
✔	✔	✔	✘
✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔
640 x 480	720 x 576	640 x 480	640 x 480
✔	✔	✘	✔
✔	✔	✔	✔
✔ / ✔ / ✔	✔ / ✔ / ✔	✔ / ✔ / ✔	✔ / ✔ / ✔
✘	✘	✘	✘
Cyberlink PowerVCR	Cyberlink PowerVCR	Cyberlink PowerVCR	WinDVR, PowerDirector SE
✔ / ✔	✔ / ✔	✔ / ✔	✔ / ✔
3 / 3 / 3	3 / 3 / 3	3 / 3 / 3	3 / 3 / 3
2	3	3	0
78	78	78	78
✔	✔	✔	✘
21	22	21	21
3 / 3	4 / 3.5	3 / 3	3 / 3
14.50	15.82	13.42	16.50
47.50	53.50	41.50	51.50
62.00	69.32	54.92	68.00
2.38	2.48	1.22	1.84
2,600	2,800	4,500	3,700

Mercury TV Tuner Card

The price is right

The Mercury TV Tuner Card is the most widely available card in the market. It's ideal for those who just want to watch TV on their computer, with no fancy trimmings. However, this card does capture content, and can also play the late night FM for you. As for the section that pertains to TV signals, channel-scanning ran into problems, but the driver fix resolved that.

The application that comes bundled keeps crashing, unless you get the update from their Web site. The interface is unintuitive, but clear. New users will take some time to get used to it, and configure the channels. You can save your channel preferences after detecting them. Also, remember to fine-tune after the channel scan for proper display. You can even make a list of your favourite channels in a particular order, and leave out the rest. It lets you take snapshots, but doesn't provide a matrix of them showing all the channels at a glance.

FM-reception is pretty good, but cannot be captured. You can also connect devices such as PlayStation2 and video cameras to this card using the S-Video or composite inputs to play games, or edit video. Content capturing was not up to the mark, and it definitely suffered when trying to capture images at a resolution of 640 x 480—the maximum value that it can go to in Ulead. Priced the lowest at Rs 1,700, it's based on the aging Philips 7130 chip with a Philips tuner. Though it's a plain card with no frills and features, it's definitely easy on the pocket, with decent capturing to boot.

The PixelView cards offered standard MPEG-1 and MPEG-2 capture, except the USB PRO, which lacked MPEG-2 capture capability. The native PixelView application needs a bit of getting used to, and Cyberlink PowerVCR gives you the freedom of shutting down the PC after a scheduled recording.

Only Pinnacle and Compro offered software to convert captured content between formats. All the TV Tuners, except the Pixelview USB PRO and Pinnacle PCTV Plus, provided FM tuners. The Mercury video card lost out on features, as it only

How We Tested

Testing TV tuners is a very subjective process, as we try to compare the quality of captured content amongst all the contenders. Some aspects of TV tuners—such as MPEG-II encoding in real-time—are hardware specific, but this process also hogs CPU time. Video encoding takes a heavy toll on system resources, irrespective of your configuration.

The test bench consisted of a Pentium 4, 2 GHz, on an Intel D850EMV motherboard, with 256 MB of RD RAM. The video card was a GeForce4 440MX, and the sound card used was a Creative 1373. We tested the cards to capture content using both, cable and S-Video, as the input sources. We used Ulead Media Studio to capture content from the S-Video input in raw format-RGB (24-bit) with CD quality audio (wav files). This was done to check the quality of the captured content without any changes or compression, made by either the hardware or software. We also used the cards to capture regular cable content using the applications and software supplied by the manufacturers. This was done to check both, the quality of content, and also the real-world performance of the card. Any issues such as crashing of applications and drivers, or dropping of frames were duly noted.

A restore point of a fresh installation of Windows XP, with all the necessary drivers and patches installed, was made. The system was restored to this point each time we installed a new card, to avoid any possible driver and software conflicts.

Needless to say, the cards performed as they were meant to, however it was the features and the final content quality that separated the good from the mediocre.

Coming to the software aspect of this month's tests, the PVR (Personal Video Recording) software test looked for noticeable differences or advantages over bundled software. As all PVR software rely on the same hardware device—the TV tuner card—they can only be adjudged on the basis of the features they offer. However, we noted a software's effort towards improving the quality of captured images in terms of noise reduction, video smoothing, etc.

We looked to answer all the questions you ask when buying PVR software: Can I play or pause a Live TV signal? Does it have the Instant Replay function? Can I skip the commercials, and catch up with the live TV signal? How long can the instant replay be? In what formats can I store the captured video?

We also tested each software for ease of use, to answer a few more questions you might have: How much time will I spend configuring the software? How easy it is to locate and set parameters? How good is the documentation? How good are the software's default settings?

bundled its own software. Any feature such as picture improvisation or NICAM stereo, would have definitely given this little card a boost in the scores here.

Performance

Performance finally decided which card was the best. We captured content in MPEG-2, for the cards that supported it, and in MPEG-1 for the cards that didn't. This was done to test a card's capabilities, including dropped frames and processor usage. Processor usage is a factor that needs attention, because a computer with low resources may not be able to directly capture data in the MPEG-2 format. A Pentium III 700 MHz processor is good enough, but for MPEG-2 recording, a Pentium III 1 GHz system is recommended. Another important aspect is the cable reception signal—often a weak signal results in considerable frames being dropped when capturing data in the RAW format (RGB 16).

Other factors also come into play *(See box, 'Heads-up' on page 55)*. The software bundled with tuner cards is very utilitarian—you can do PVR work, as well as minor video editing, without having to pay more for software. All the cards captured content at the highest resolution that PAL supports. A cable signal is transmitted at a resolution of 720 x 576, and if content is captured at 640 x 480, it looks decent enough. The amount of dropped frames count, and the overall captured content quality may not be impressive, but a little tweaking will definitely get you satisfactory results.

The Compro and Pinnacle cards were neck-to-neck in terms of content capture and processor usage. The overall quality of content of both the cards was similar, and we had a tough time choosing between them. Aviosys was another card that performed well. The Pixelview's lost badly—except for the PlayTV XP, which put up a decent show. Some cards required fine-tuning after the automatic channel—the Mercury and Compro yielded grainy pictures, which cleared when we fine-tuned. The Pixelview PlayTV PRO also required fine-tuning, but gave pretty decent content quality. The processor usage remained the same across the board—all the cards utilised 21 per cent processor time, when capturing data.

Overall, the Compro and the Mercury came out as our performance and value winners, but the Pinnacle duo does deserve a worthy mention for their commendable performance. The Compro won because of the features it packed and the performance it showed, while the Mercury won because of its extremely competitive price of just Rs 1,700 that no other card was able to match.

Compro	Mercury	Pinnacle	Pixelview
Mediatech India	Kobian India Ltd	Aditya Infotech P.ltd	Rashi Peripherals
022- 26361111	080-5566626	022-26338555	022-28260258
sales@media-techindia.com	rohit_varma@kobian.com	vijay_singhal@adityagroup.com	ho@rptechindia.com
www.comprousa.com	www.kobian.com	www.pinnaclesys.com	www.prolink.com.tw

>> What Makes a Home Theatre

1 Media Center PC: This is the hub of all your computing activities. Since it has an inbuilt TV tuner, you can watch TV on your PC, which can be re-directed to your wide-screen plasma TV display. Use the one-touch remote to control all functions such as playing TV, FM-radio etc., and also capture programs.

2 Display: An important component of a home-theatre setup. It can be your CRT or LCD monitor, hooked up to the Media Center PC, or a regular TV. You can also opt for a High Definition TV (HDTV), a rear-projection TV, or a plasma TV display for better experience.

3 Speakers: Those thumps, booms and clinks need sound to be as life like as possible. You can choose from a wide range of speakers, ranging from normal stereo speakers, 2.1s, to 7.1 systems for a surround-sound experience.

4 DVD player: The Media Center PC comes with a DVD drive. However, if you love lining your DVDs one after the other, then a five-disc DVD changer is what you need.

5 Wireless peripherals: All the devices mentioned above come with their own remotes. So when you sit down to watch a movie, you will have at least four remotes in your hand. Doesn't leave much room for the popcorn now, does it? The universal remote is what you need.

An upgrade would be the learning remote that has an LCD display, does everything what the universal remote does, and also learns the patterns in which you use your remote. Oh, let's not forget the wireless keyboard and mouse that controls the Media Center PC. After all, you're not going to be watching movies all the time.

Mary Xavier

SOFTWARE

iuVCR

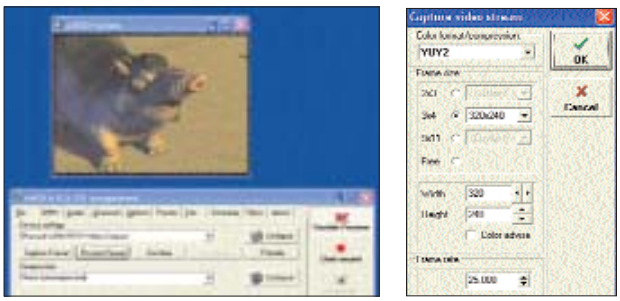
Good, but not the best

iuVCR's friendly and simple interface allows you to capture video in any format, frame size and duration. At the same time, because of its integration with Windows scheduler, it starts and stops recording automatically.

It is strategically made—parameters such as 'Max file size' and 'Max file time', ensure that the file size does not exceed that of the recording media, or eat up the entire free space. These parameters also help you avoid the maximum size limitation of file systems such as FAT32, which restrict the file size to 4 GB. You can even specify partitions across which to span the recording. This leads to efficient disk space usage.

By default, iuVCR captures video in the AVI format using either the huffyuv compressor, or the PICVideo MJPEG compressor. You need to install the necessary encoder, if you wish to record in Microsoft Windows Media Format. The recording options also provide control over audio-video synchronisation. To enhance image quality as it gets captured, create filters within the application. There is also support for additional plug-ins to process real-time video streams.

A natty feature is the one-touch button that captures your favourite television moments. Unable to snap that shot at the right time? Capture the entire live video in a series of bmp files, and later choose the one you need. The Info tab shows you useful real-time statistics such as the number of frames recorded or skipped, the output file size, free drive space and the current CPU usage.



Use the Capture Format settings to modify colour format, frame size and frame rate

Lastly, a simple presets manager allows you to set and save all the current program settings under a unique name. You can use this name in the scheduler, or when starting iuVCR with command-line parameters.

While it did well in the performance department, iuVCR lacked features such as real-time TV functionality to pause and resume the TV signal at will. Thus, it did not differentiate itself from the rest of the products in the market.

Price: US$ 27.50

Web site: www.iulabs.com

\+ Span the video capture across drives; apply filters in real-time
– Lacks real-time TV functionality

PowerVCR II Standard Version

Truly professional

Armed with top-of-the-line features such as time-shifting and instant replay, PowerVCR II makes TV-viewing enjoyable. With the time-shifting feature, you need not wait for a commercial to answer nature's call. Use the Instant Replay button to watch the fall of wickets in a cricket match. The instant replay interval could be anywhere between 10 to 70 minutes.

PowerVCR II is very user-friendly—a small window pops up after its installation, to help you set up the channels. It provides pre-defined profiles—MPEG-2 Excellent, MPEG-2 Superior, MPEG-2 Good and MPEG-2 Average—to capture video. It has similar options for MPEG-1 too. VCD profiles such as VCD NTSC, VCD PAL and VCD Film are also available. It can convert the captured video from, or to, any of these formats, without the need for a third-party converter. It also has controls to tweak image brightness, hue, etc, while recording. The button on the TV-controls panel lets you snap a funky TV visual. An image file is automatically created in a default folder. You can also change the storage folder location.

Another useful feature is the automatic naming of files. Were it not for this, accidental double-clicks on the Record button would have overwritten the current recording session in the preceding file.

Setting up the audio-video source, as well as its format, is the most important task in PowerVCR II

Apart from the all-important inbuilt scheduler, a significant feature present is Stop Condition, that stops the recording after a time interval that you define.

Thus, a mélange of features, topped with great functionality, makes PowerVCR II the winner in this category.

Price: US$ 49.95

Web site: : http://www.gocyberlink.com/english/index.jsp

\+ Live-TV options; wide variety of formats to capture video
– A drab time-based stop condition

VirtualDub

Only if it knew how to win

The best thing about VirtualDub is its range of stop conditions. Stop capture if the capture time, the file size, or the dropped frame ratio exceeds, or the free space drops below a specified limit.

Like others in the fray, VirtualDub lets you apply filters, or rather a sequence of filters, to the capturing process. Its video filter dialog allows you to string together a chain of filters that blur images, re-size the image frame and reduce noise in the captured frame sequentially.

The software puts a lot of stress, and rightly so, on the proper capture of video—capture video minus jitters, noise, etc. To do so, it has a variety of settings such as the noise reduction, field-swapping, cropping, etc.

By default, VirtualDub records in the VCD format. As in iuVCR, you will need to install the appropriate codecs to record in other formats. Sadly, it also does not provide any video compression of its own. A volume meter helpfully gauges the audio input level, and controls the audio level of the recording.

Like iuVCR, VirtualDub names the captured file automatically. It applies a numeric suffix to the filename, which is incremented every time the recording is completed. However, you need to turn this feature after the software is installed.

VirtualDub has a number of stop conditions as compared to the rest of the gang

And yes, it's absolutely free!

Price: Free
Web site: www.virtualdub.org

\+ A variety of stop conditions; provides controls to monitor quality and noise
– Does not have video compression

WinDVR

A near miss

Out of its satchel of features, one that is unique to WinDVR is transcoding. This transforms the captured video from MPEG to AVI, and vice-versa. Another of its exclusive assets is its inbuilt support to burn recorded movies onto CDs.

Like PowerVCR, WinDVR lets you have that much-needed control over TV signals. It supports both instant replay, as well as the pause-and-resume functionality for live video. While the instant replay time interval could be anything in the range of 1 to 600 seconds, the time-shifting interval can be any value between 1 to 6,000 minutes.

Another similar feature, is the list of pre-defined profiles such as MPEG-2 Good, MPEG-2 Better and MPEG-2 Best, and a variety of PAL/NTSC recording formats.

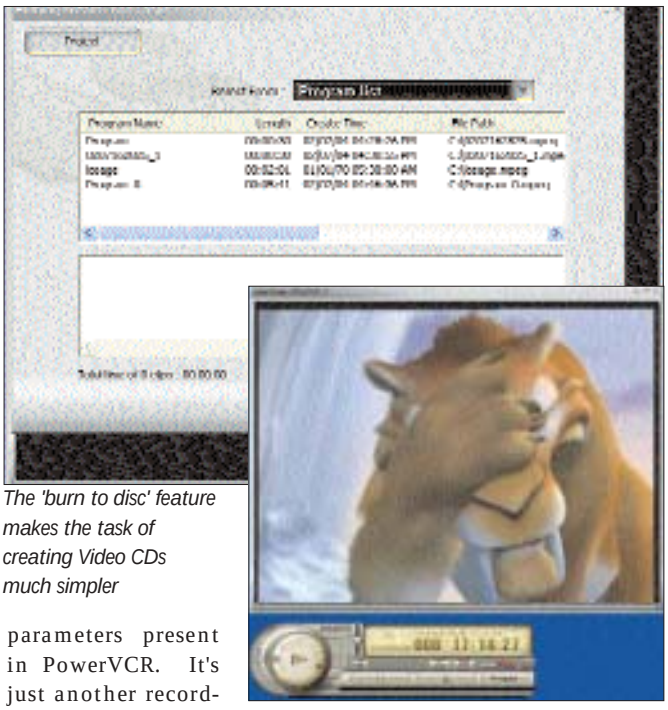
You are bound to get into the habit of skipping commercials using WinDVR. The parameter that makes this possible is completely customisable, and its value can be anything between 1 to 600 seconds.

Apart from features such as snapshot, scheduling, compression and previewing while you record, you can also password-protect adult channels. Incidentally, only WinDVR's developers were thoughtful enough to include this feature.

If you have set up two monitors, you can configure the software to play recorded video on one screen, and a TV signal on the other simultaneously!

You can also specify the minimum space needed by Windows in the worst-case scenario wherein WinDVR starts to hog nearly all the available space to record a signal.

All said and done, WinDVR lacks the advanced recording parameters present in PowerVCR. It's just another recording software that you may want to consider if you have children running around the house.



The 'burn to disc' feature makes the task of creating Video CDs much simpler

Price: US$ 395 (20 users)
Web site: www.intervideo.com/jsp/WinDVR_Profile.jsp

\+ Transcoding and burn-to-disc features; live-TV options
– No advance recording parameters such as noise reduction

WinVDR

Nothing but formats

Swap two letters in the name of the previous software and you get WinVDR. However, barring the name, which is somewhat similar, both software are far apart in terms of features and user-friendliness.

Windows Video Disk Recorder (WinVDR) itself has variants that capture video in the AVI or the WMV formats. A better version, WinVDR Pro, captures video in DivX, WMV, AVI, MPG and MP4 formats.

The software has a mixer similar to VirtualDub that is useful to monitor, as well as control audio input levels. WinVDR provides an excellent way to capture video from the TV-Tuner card directly to a variety of formats in real-time mode. Generally, WinVDR supports any PCI-bus mastering capture device that uses the Brooktree (Bt848/878) chipset.

Stop conditions depend only on time; disk space is not taken into account. Hence, there's no way to stop the capture, in case of lack of space; all WinVDR displays is an unhelpful error message.

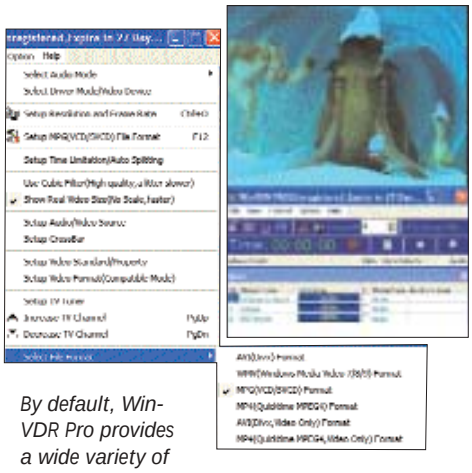
Make that Switch

A common misconception is that you have to sacrifice comfort when you switch to watching TV on your PC. Though this may have been true a few years ago, today, almost all TV tuner cards come with remote controls to enrich your experience. All you have to do is spend the first hour configuring the channels, then sit back and enjoy the show—with the added advantage of being able to pause live TV, and watch instant replays.

In fact, if you have the Windows XP Media Center edition, you don't even need to spend that first hour using the mouse. The navigation is designed to be used from a remote control, instead of a keyboard-mouse combination. It uses a simple list of functions instead of the standard Windows menus with buttons all over dialog boxes.

Just like Media Center Edition, most TV tuner cards bundle PVR software that work well with the bundled remote control. Though the software interface may not be viewable from a distance, most remote controls have neatly labelled buttons—just as TVs do—so operation is a snap. The sad truth is that most third-party software do not support remotes, and are a pain to use.

Apart from features such as preview and scheduler, it also has helpful little settings that let you prevent the screensaver and the power manager from running when capturing video.



By default, WinVDR Pro provides a wide variety of file formats to save the captured video

However, you cannot pause and resume a TV signal at will, nor watch an instant replay—a point that went against it. Also, it records just one show at a time. Hence, you will have to narrow down your choice to a single show if your favourite television soaps overlap.

Price: US$ 39

Web site: www.artech365.com

\+ Captured files named automatically based on system date or time; control audio input level
– Lacks real-time TV functions

End of the show

Well, as they say it on TV, that's all folks! We took you through 10 TV-tuner cards and five personal video recording software along with the big Media Center PC.

WinDVR and Cyberlink PowerVCR II happen to be the most commonly bundled PVR software. When pitted against each other and three more, in our tests, PowerVCR II won the battle hands down. Though WinDVR had unique features such as transcoding, Power VCR II powered further ahead in the race, thanks to the advanced recording parameters that let it reduce noise and enhance picture quality.

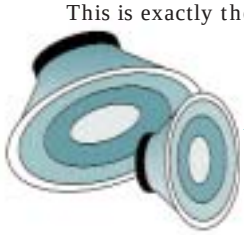
In the TV-tuners section, the cards from Pinnacle and Compro fought for the top slot. The Compro VideoMate TV Gold Plus, with intuitive software and nifty features, proved itself worthy of the performance crown. On the other hand, the Mercury TV Tuner Card had enough features that did justice to its low price and walked away with the crown for Best Value.

The HCL Beanstalk AQ265 Media Center PC is one big entertainment solution. Complete with speakers and an LCD screen, you won't need anything else to complete the experience of watching a movie or playing games. Oh yes, it comes with a gamepad too! Easily configurable, with just a few wires to plug in, this Beanstalk is sure to give you a rollicking time!

>> Sound Unbound

Tom Cruise is trying to escape the authorities, but they aren't giving up on him. Their footsteps echo on the metal floor. One of them gets his hand on Cruise, but gets a fist in his face instead. Thump. Tom picks up the shockwave gun dropped by him and loads it up. A metallic creaking sound emanates as he loads, and fires it. A deep rumbling sound rattles the glass windows. Had it not been for the pillow that you tore to bits in sheer excitement, you would not have known that you are in the confines of your room! Cruise shot shockwaves right in front of you! This is exactly the kind of experience you should expect from a good speaker set—sound that fills your senses and overwhelms you. Be it music, movies or games, anything will sound good, provided you have the right set of speakers. And this month we help you make a sound choice.

We didn't include 2.1 systems, as they can't really be compared to the quality of, say, a 4.1 or 5.1 system. We have top-of-the-line PC speakers, ranging from the Altec Lansing 641 in the 4.1 category, to the Megaworks in the 5.1, and the Creative Inspire T7700 in the 7.1 category. Go through our comparison, and get rid of those tinny stubs sitting on your desktop.



4.1 SPEAKERS

We tested 14 speakers in the 4.1 category, including the popular picks, and even the select expensive ones. Let's take a look at how they fared.

Performance

Sure, it's great to have FM radio or remote controls, but what really matters is the quality of sound. So let's put aside the features, documentation and ease of use for later, and jump straight to the performance scores.

In our gaming tests, the Creative Inspire shone, and though the Odyssey and the Artis speakers performed decently, they couldn't match Creative in the boom and thump department. The Intex IT 2600W speakers were disappointing, and *Quake III* sounded more like *Quack III* on them. The rest were just about average. Most of the speakers lacked full-bodied, ambient atmospheric sounds—the sounds were just tinny and sharp. Another reason for the dismal performance is that most of these speakers are pseudo 4.1—they don't actually have four discreet channels, but instead replicate the two stereo channels in both the front and rear speakers, which just isn't enough for gaming.

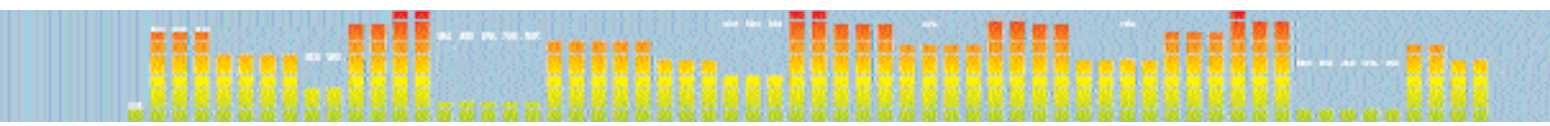
Almost all the speakers were washouts in the movie test, barring the superb Creative set, the Philips and the Odyssey. The Philips made up for its poor gaming scores with good sound quality for movies. The Odyssey also performed well here, but the Creative was the best again.

Now for the real meat of the tests—the music tests. The Artis played *With or without you* by *U2* beautifully, with bass that was tight and punchy, and no booming. The Creative subwoofer failed and started distorting at higher volumes—it gave up long before the Artis could even show signs of distortion. Though not considered to be in the class of Artis or Creative, the Adcom also did pretty well with this song. It needs to improve its gaming and movie performances tremendously, though.

Here's the entire 4.1 range of speakers, lined up for a photo shoot

The Artis stayed in the lead for *Bullet the blue sky*, also by U2—the mids stayed sharp, and didn't go muddy (mixing of the mids and highs) at higher volumes. Both, the Adcom and Creative Inspire, went muddy at higher volumes. There was also a high amount of distortion evident with most of the speakers when playing this song. Even the Philips wasn't able to do the song justice.

For the both the Hindi songs—film music and the classical piece—



Profile

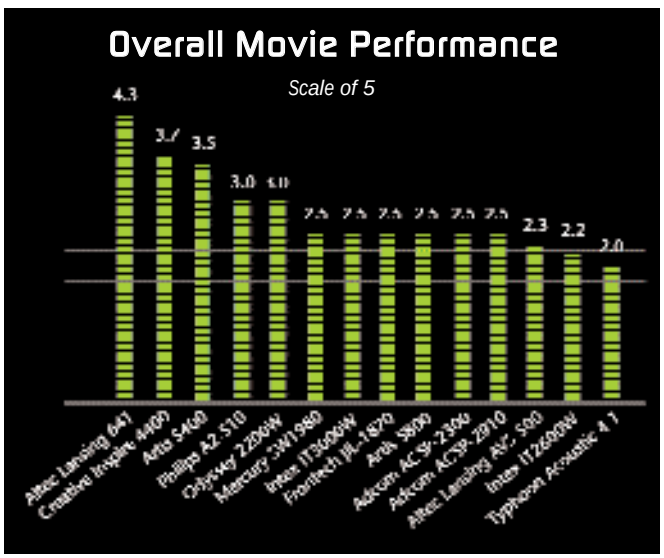
We got **NISSAR ALI CHIKATE** to give us a professional's opinion on the speakers we tested. He started out a assistant engineer for *Akashwani*, *Mumbai* in 1989. He then joined *Radio Mid-Day* as production engineer in 1995. He is now the technical-in charge (station engineer) of Go 92.5 FM—Radio Mid-Day's new avatar. Well-known in the recording industry, he was responsible for a live broadcast of the Zubin Mehta concert on AIR FM from the Brabourne Stadium.

the Artis S400 lead the pack. Following closely were the Odyssey and the Creative. The Artis S800 was surprisingly behind the S400 in terms of performance, although it is priced about 600 rupees more than the S400. The Frontech did a pretty good rendition of the Hindi songs—especially the classical piece, *Rachna Teen Taal*, by Ustad Amjad Ali Khan—where it held its own against the biggies. In fact, it beat the Inspire, and was second only to the S400.

The Inspire clearly led the pack in the DVD-Audio tests, with richer and distinctive sound. The Philips was another set of speakers that excelled in the DVD-Audio department. Surprisingly, the Philips sound much better when DVD content—movies or music—is played.

The Typhoon and the Intex were just in the wrong league here, and were disappointing. What sounded like a bass drum on the Creative or Philips set, sounded like someone kicking a tin-can on the Intex IT3000W.

In our audio frequency file tests, there was a wide spectrum of variance among the speakers. The Intex IT3000W scored the lowest, while the S400 was the winner in the tests. The overall bass champion's crown was shared by the S400 and Creative. The Altec Lansing was the winner in the overall treble scores, followed closely by the Creative, Artis S400, S800, Frontech and the Odyssey.



Creative Inspire 4400

Lord of the sounds

The Creative Inspire 4400 has a sub-woofer that comprises a wooden enclosure finished in black. A thin black veil protects the woofer cone from dust.

A small-wired remote control lets you handle the volume. The sub-woofer has a rather discouraging bass control knob—you have to bend your back to access it. Unlike other Creative speakers, this set is powered by a small, neat-looking power adapter. The long wires allow you to place the speakers at the right distance.

On the performance front, the only speaker set that completely outshone the Inspire 4400 was the Altec Lansing 641. The Inspire 440 was a great sport in the gaming arena. The bass was undistorted, and the punch, tight. The highs were clear and distinct. It hit a similar note in the music tests. The effects in the DVD test, though, not all that inspiring, were better than the crowd. The speaker response is true to the input, until the 75 per cent mark of the volume level. Push it beyond that, and distortions and sound clipping from the woofer gets noticed.

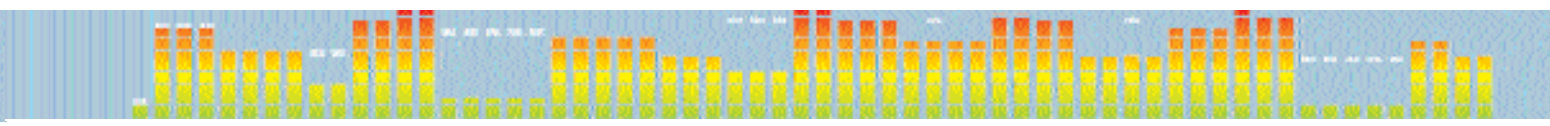
Priced at Rs 3,500, the Inspire 4400 provides a bang for the buck as far as 4.1 sets are concerned. Therefore, geeks and gals, we are pleased to crown the Creative Inspire 4400 as our performance winner.

Price: Rs 3,500
+ Good response
– Slightly under-powered sub-woofer

Creative Inspire 4400	B-
Performance	
Features	
Build quality	
Value for money	

"The reproduction of low bass, as well as the upper highs is good. It gives dynamic image for overall sound. Though the wattage rating in total is only 41 W, they deliver more fuller sound. I enjoyed them"

— NISSAR ALI CHIKATE



How We Tested

The testing of speakers was completely subjective. Our test-bed consisted of an Intel 875PBZ motherboard running a Pentium 4 3 GHz with 512 MB 333 MHz DDR RAM. The sound card used was the SoundBlaster Audigy2 ZS Platinum PRO that supports 7.1 speakers, while the video card used was the Radeon 9600 PRO.

Our tests involved two steps—first, we kept the sound control volume—bass, treble, master, wave, speaker master, etc.—at 50 per cent and ran the tests to check the quality of the sound output. Then we increased the volume to the maximum for both, sound card and speakers, and carried out the same tests. We used the native sound control panel for the sound card, and the volume control on the speakers. Equalizers were never turned on, to avoid any effects.

Features, Ease of Use, and Manuals and Documentation were assigned 15 per cent, 10 per cent and 5 per cent of the total scores respectively. The most important, performance, earned 70 per cent.

We carried out tests that involved everyday media plus some special frequency tests. Ratings were given, on a scale of 5, for each test by three different reviewers, and then we calculated an average score to reduce subjectivity. Our tests involved the following benchmarks.

Gaming tests: We carried out two gaming benchmarks—*Aquamark3* and *Quake III*—and the sound quality for each was noted. We ran the complete *Aquamark3* demo and the *Quake III* Intro movie.

Movie test: This involved DVD playback of the *Minority Report* automobile assembly fight sequence. This scene is noted for low frequency effects of the shockwave gun, and the general atmosphere involving metallic objects and lasers in the plant, which have a sharp tone.

Music tests: Three separate tests were run here—an Audio CD test, MP3 playback and DVD audio—comprising both Hindi and English songs. The songs we chose for the Audio CD test were *'With or Without You'* and *'Bullet the Blue Sky'* by U2 from the album *The Joshua Tree*, *'O Rey Chhori'* from *Lagaan* and *'Rachna Teen Taal'* from Ustad Amjad Ali Khan's album *Raag Yaman.* The MP3s we played were '*Hotel California'* by the Eagles and *'Duur' (Reprise)*' by Strings. For the DVD audio test, we played *Shut Up* by Vanessa Lausdei.

Each Audio CD song was chosen for a reason: *With or Without You* has deep percussive bass that test the subwoofer; *Bullet the Blue Sky* has guitar fireworks that test the mids and highs at full volume; *O Rey Chhori* tests the reproduction of vocals while the sprinkling of piano pieces simultaneously tests the highs; *Rachna Teen Taal* tests all the speakers with the *Santoor* and *Tabla* combination.

MP3s are compressed audio that generally sound good on any speaker. We used the normal 128 Kbps, joint-stereo format. *Hotel California* tested the subwoofer with its deep bass notes, and *Duur* checked the treble reproduction.

The DVD audio song is encoded in five discrete channels, and features excellent mid-range, treble and vocals.

Frequency Tests: These tests involved the playback of special wav files corresponding to the frequencies of 50 Hz, 100 Hz, 250 Hz, 500 Hz (left and right channels), 1 KHz, 10 KHz and 15 KHz. Points were given to the speakers the could reproduce the tones perfectly.

Overall Bass and Treble Tests: We played an audio file to check the overall bass reproduction, and did the same to check the treble.

Point One Out

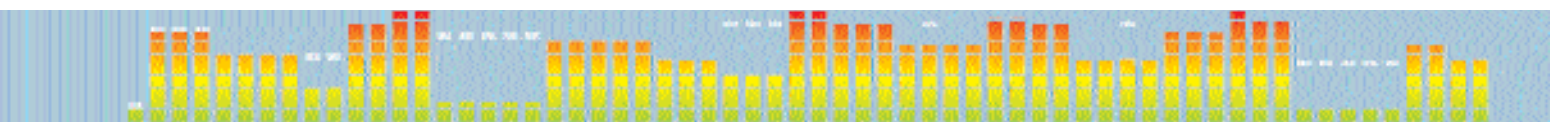
Four point one, Five point one... stuck in decimals? Here's a small primer on the different surround formats out there:

4/4.1 format: This is a psuedo-surround format as it simulates the surround effect to a certain degree. It utilises two channels—the left and right stereo channels. The surround channel information for the rear speakers is encoded on to the original stereo channels at a set phase difference and then supplied to the rear speakers. In case of a separate sub-woofer, all bass effects are diverted to it via a suitable crossover that's located on the sub-woofer itself or the amplifier. This format is on its way out, especially with the falling prices of 5.1 and higher certified audio systems.

5.1 surround: Also known as Dolby Digital, this surround-sound format was introduced by Dolby Systems and was first utilised in the soundtrack of *Batman* in 1992. It was the first to feature a dedicated centre channel, as well as a low frequency effects (LFE) channel, in addition to the four existing channels. Also, this was the first true surround format that had truly discrete channels, i.e., all the speakers received an independent signal without any distortion or channel mixing. Dolby Digital was followed by Digital Theatre System (DTS), which offered better compression than Dolby Digital, giving better audio quality. Today, most movies and many games are encoded using either the Dolby Digital or DTS formats. The centre channel here assumes a good deal of importance, as all human voices are channelled through it to provide a centralised listening experience.

6.1 surround: In this surround setup, an additional rear centre speaker is connected to the existing five plus one setup. The signal for this speaker is obtained by separating a central rear channel from the original left and right rear signals. The Dolby Digital EX and DTS Pro Neo 6 can output 6.1 channel signals. As this is a comparatively newer format, there are only a limited number of movie soundtracks that feature this.

7.1 surround: This is a top-of-the-line setup, with three speakers in the front, including the centre unit, two speakers on each side of the listener, and two rear speakers to complete the surround effect. Currently, there are no applications or movies that can utilise such a setup, but some decoders have the ability to upmix 5.1 or 6.1 sound to give a 7.1 output.



Frontech JIL-1870

Radio ga ga

Frontech's JIL-1870 was the cheapest 4.1 speaker set that made it to this comparison. In the looks department, its heavy dash of unnecessary chrome raised some eyebrows. The wooden satellites wear a classic look, with ebony-black finish and a black satin veil on the front. The sub-woofer sports a nicely brushed aluminium finish. However, a big, cheap-looking chrome plastic line around the sub-woofer port mars its looks. The chrome-finished control knobs are straight out of a classic radio. The set also comes with a built-in FM tuner. The push buttons that let you skip through stations are hard and tacky, and require quite an effort. The wires for the rear satellite are long enough, but the front satellite wires are quite short. Hook up the external wire antenna at the back of the sub-woofer for proper FM reception.

In the gaming test, the speaker performed decently with the volume at 50 per cent. When we raised it above that, distortions were clearly audible from the satellites, as well as the sub-woofer. The effects in the DVD-video test lacked spatial resolution due to its pseudo 4.1 nature. However, in the Hindi-CD audio and MP3 test, the audio quality was much better, and the response more balanced. Overall, the Frontech JIL-1870 speakers sound well till the master volume is kept below the 70 per cent mark.

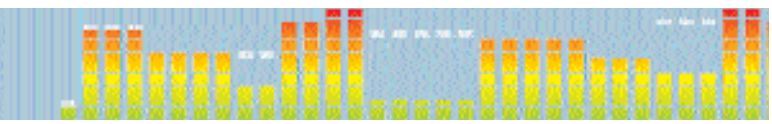
Priced at Rs 1,750, they offer decent audio quality and good features. Except for the Mercury SW1980, no other 4.1 speaker set can really come close to the Frontech JIL-1870 in terms of value for money.

Price: Rs 1,750
+ Good value for money
– Distortion sets in too early

Frontech JIL-1870	A-
Performance	
Features	
Build quality	
Value for money	

"The sensitivity of these speakers is very low, so, input should be such that it will give the correct audio. They sound tinnier, i.e., the high mid-frequencies (2 to 3 KHz) are boosted. I can say the bandwidth of the audio is little better than analog telephone lines. The CD-audio sound on these speakers sound like audio is compressed at 64 Kbps."

— NISSAR ALI CHIKATE



1/2 page V AD

SCORE BOARD

CATEGORY	4.1 SPEAKERS					
Brand	**Adcom**	**Adcom**	**Altec Lansing**	**Altec Lansing**	**Artis**	**Artis**
Model	ACSP-2910	ACSP-2300	641	AVS 500	S400	S800
Speaker Specifications						
Speaker Setup	Pseudo 4.1	Pseudo 4.1	4.1	4.1	Pseudo 4.1	Pseudo 4.1
Total RMS Power (W)	40	40	200	30	32	34
Subwoofer (W)	20	20	100	13.7	NA	NA
Satellites (W-per channel)	5	5	25	3.6	NA	NA
Frequency response	30 Hz-20 KHz	20 Hz-20 KHz	27 Hz-20 KHz	38 Hz-18 KHz	40 Hz-80 KHz	40 Hz-18 KHz
Controls provided on speaker set / Remote control						
Volume / Bass / Treble / Surround Effects	✔/✔/✘/✔	✔/✔/✘/✔	✔/✔/✔/✔	✔/✔/✘/✘	✔/✔/✘/✘	✔/✔/✘/✔
Miscellaneous	FM tuner	NA	Wired Remote	NA	NA	NA
Build Quality (So5*)	3	2.5	4	4.5	3.5	3.5
Manual & documentation (Y/N)						
Listing of specifications / Quick setup guide / Troubleshooting	✔/✔/✘	✔/✔/✘	✔/✔/✔	✔/✔/✘	✔/✔/✘	✔/✔/✘
Ease of Use (So5*)	1.5	1.5	3.5	2.5	2.5	2.5
In-game audio quality						
AquaMark3 / Quake III	2.5 / 2	2.5 / 2	4 / 4.5	2 / 2.5	2.5 / 3	2.5 / 2.5
DVD Movie audio quality – VOB File	2.5	2.5	4.25	2.5	3.5	2.5
DVD-Audio: Treble / Vocals / Bass	2 / 2.5 / 1.5	2.5 / 2 / 1.5	4 / 4 / 4.5	3 / 3 / 2.5	3.5 / 3.5 / 3	3 / 3.5 / 3
Audio CD quality						
English: Song 1 / Song 2	3 / 2.5	2 / 2	4 / 4	2 / 1.5	3.5 / 3.5	3 / 3
Hindi: Song 1 / Song 2	3 / 2.5	2 / 2.5	3.5 / 4	2.5 / 2.5	4 / 3.5	3.5 / 3.5
MP3 quality: Song 1 / Song 2	2 / 2.5	2.5 / 2	4.5 / 4	2.5 / 2.5	3.5 / 4	3 / 3
Special frequency test files – overall response	2	2	4	2	2.5	2
Ultimate Bass Test / Ultimate Treble Test	1.5 / 2.5	2 / 2.5	4.5 / 4	1.5 / 3.5	3 / 3	2.5 / 3
Performance	32.49	30.16	59.72	32.18	44.58	38.31
Features + Ease of use + Documentation	9.90	7.95	17.70	11.30	10.85	12.10
Grand Total (Performance + Features)	42.39	38.11	77.42	43.48	55.43	50.41
VFM	2.79	3.19	0.58	2.17	3.78	2.70
Prices (Rs)	2,275	1,790	20,000	3,000	2,200	2,800
Grade	B-	B	C	C+	B+	B-

** Scale of 5*

RMS Vs PMPO: The Real Deal

RMS (Root Mean Square) power represents the average sustained power output by an amplifier while Peak Music Power Output (PMPO) is its peak power, or maximum power output. They are related to each other using the dynamic headroom specification given in dB. So, an amplifier with 3 dB of dynamic headroom has a peak power that's double its RMS or average power. Hence, a 100 W RMS amplifier, with a dynamic headroom of 3 dB has a peak power output of 200 W. A 3 dB increase doubles the power output. So, for 6 dB and an RMS power rating of 100 W, an amplifier's PMPO would be 400 watts. Note that you need to bother only about the RMS power rating.

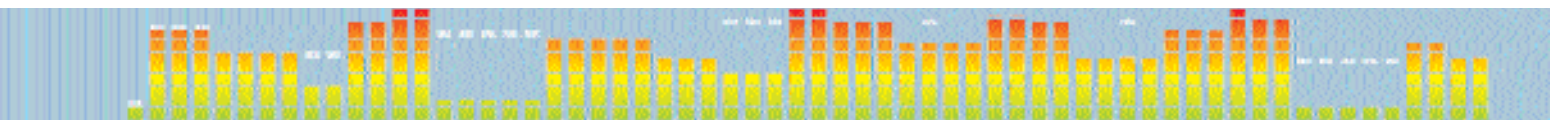
Peak power is a relatively useless value in every day life, as it is only used for very short periods of time. For loud sounds that need a lot of power, the amplifier may output a peak power of a lot more than 125 watts, maybe even 400 watts for just a short period—a fraction of a second. High RMS power provides the punch needed to play sound at higher volumes without distortion.

Manuals and documentation

All the speakers provided a leaflet with information about the specifications and setup instructions. Creative, however, provided a quick setup guide with detailed instructions, while Altec Lansing provided a detailed manual with specifications, setup and troubleshooting instructions for the 641, and just a manual with setup instructions and precautions for the AVS 500. Frontech was the worst of the lot—they didn't provide any documentation at all. Odyssey followed the same trend and provided just a quick setup guide, but no specifications. The rest—Artis, Adcom Mercury, Typhoon and Intex—provided just a leaflet mentioning the specifications and speaker setup instructions.

Features

The Adcom, Frontech and Mercury speakers had inbuilt FM tuners, which is cool because you can listen to the radio even when the PC's turned off. Otherwise, none of the speaker sets were anything to write home about. The Intex had a PC/VCD button that toggles sound input between the PC and external VCD player that you can connect to it.

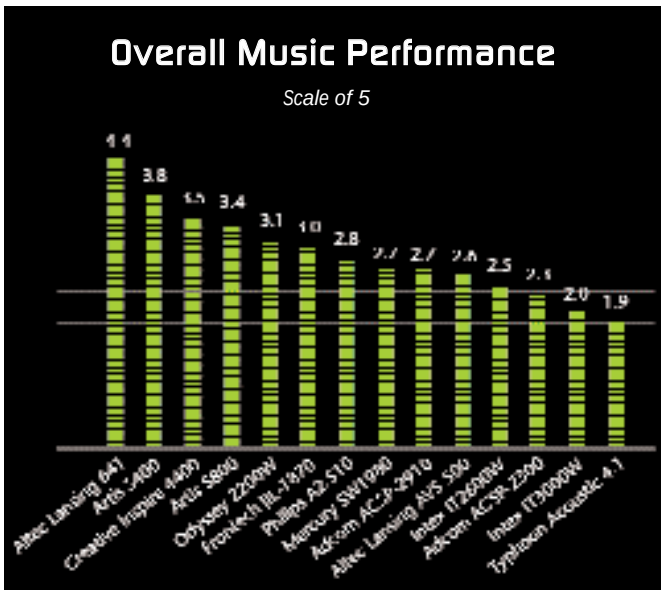


4.1 SPEAKERS

Creative	Frontech	Intex	Intex	Mercury	Odyssey	Philips	Typhoon
Inspire 4400	JIL-1870	IT3000W	IT2600W	SW1980	2200W	A2.510	Acoustic 4.1
4.1	Pseudo 4.1	4.1	Pseudo 4.1	Pseudo 4.1	4.1	4.1	4.1
41	37	150	130	30	NA	35	42
17	15	50	50	NA	NA	17	20
6	5.5	25	20	NA	NA	4.5	5.5
40 Hz-20 KHz	30 Hz-20 KHz	20 Hz-20 KHz	40 Hz-20 KHz	40 Hz-18 KHz	20 Hz-20 KHz	40 Hz-20 KHz	48 Hz-20 KHz
✔/✔/✘/✘	✔/✔/✔/✘	✔/✔/✔/✔	✔/✔/✔/✘	✔/✔/✔/✘	✔/✔/✘/✘	✔/✔/✘/✘	✔/✘/✘/✘
Wired Remote	FM tuner	NA	NA	FM Tuner	NA	NA	NA
4.5	3	2.8	3.5	3	3.5	3	2.5
✔/✔/✘	✘/✘/✘	✔/✔/✘	✘/✘/✘	✔/✔/✘	✔/✔/✘	✔/✔/✔	✘/✘/✘
3.5	2	1.5	2	3	2	2.5	2
3.5 / 3.5	2 / 2.5	2 / 2.5	1.5 / 1.5	2.5 / 2.5	3 / 3	2.5 / 2	2 / 2
3.5	2.5	2.5	2	2.5	3	3	2
3 / 3.5 / 3	3 / 3 / 2.5	1.5 / 2 / 1.5	2.5 / 2.5 / 2	2.5 / 2.5 / 2	3 / 2.5 / 2.5	3.5 / 3.5 / 3	2 / 2 / 1.5
3 / 3.5	2.5 / 2.5	2 / 2	2.5 / 2.5	2.5 / 2.5	3 / 3	2.5 / 2.5	2.5 / 2.5
3.5 / 3.5	3 / 2.5	1.5 / 2	2 / 2.5	3 / 3	3.5 / 3	2 / 2.5	1.5 / 1
3 / 3	3.5 / 3	2.5 / 2	2.5 / 2	2.5 / 3	2.5 / 3	2.5 / 2	1.5 / 1.5
1.5	3	1	2	2	2	2	2
3 / 3	2.5 / 3	2 / 2	2 / 2.5	2 / 2.5	2.5 / 3	2 / 3	2 / 2
42.51	37.90	27.24	29.61	33.66	39.10	35.08	27.20
15.70	8.25	10.30	8.90	8.00	10.80	11.85	7.80
58.21	46.15	37.54	38.51	41.66	49.90	46.93	35.00
2.49	3.96	1.91	2.75	3.47	3.25	1.47	2.63
3,500	1,750	2,950	2,100	1,800	2,300	4,795	2,000
B+	A	C+	B	B+	B	C	B

"The Altec Lansing 641's bass and treble power are balanced, so it gives good quality listening. These speakers are best for quality listening at an affordable price, although I did not quite like the look of the speakers."

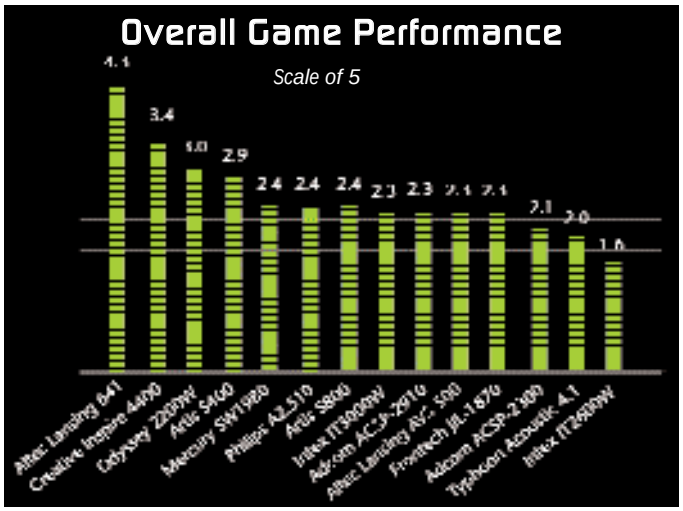
— NISSAR ALI CHIKATE



Ease of Use

Much to our satisfaction, all the speakers came with colour coded cables—except the Typhoon, which can be a pain to set up. Setting up the speakers was a snap, with no problems that a quick reference to the leaflet couldn't solve.

Most of the speakers that made to our Test Centre, came without remotes, and only had controls for the subwoofer. Though the Adcom, Mercury, Frontech, Artis, Typhoon and Intex speakers had the controls on the front of the subwoofer, the Creative, Philips and Odyssey speakers had theirs behind. Controls on subwoofers are very irritating, especially if you place your woofer on the ground, behind your cabinet, or some place just as inaccessible. The saving grace is that the



Philips has its main volume control on the front right satellite, while the Creative has a wired remote.

Conclusion

Though the RMS rating and performance of the Altec Lansing 641 4.1 was way above all the other contenders, its price is just as steep—almost four times more than the rest. This is definitely the best 4.1 speaker system money can buy, but for Rs 4,000 more, you can get the Creative Megaworks 5.1, which offers a higher RMS, performance and the 5.1 channel experience.

We awarded the performance crown to the Creative Inspire 4.1. It can play anything you want with aplomb, and has rich sound. The Frontech JIL-1870 was the value winner. It was average in terms of performance, but for just Rs 1750, the speaker is a good deal if you aren't too much into gaming or movies. Music is okay on these speakers, but don't even think of turning the volume all the way up.

5.1 SPEAKERS

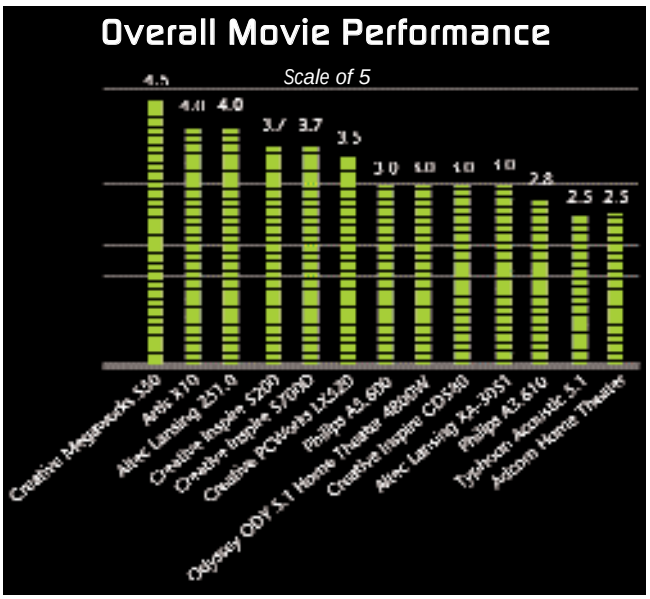
The one major advantage 5.1 speakers have over the 4.1 variety, is the centre channel. This channel is used for the vocals, and performs a crucial part when viewing a DVD movie. Overall, a decent set of 5.1 speakers is better than any 4.1 set of speakers, in terms of sound quality. Let's find out which 5.1 set triumphed.

Performance

In our gaming tests, the Artis X10 and the Creative Megaworks ruled the roost. Nothing can beat the *Quake III* scene where the cigar falls on the ground—the boom shook the Test Centre's windows! The Artis did not achieve the fidelity that the Creative was capable of, but gave it a fair run for its money. The Creative 5700D could not match either in terms of muscle power, but its acoustic clarity was simply amazing. We used the optical out to test the speakers, and give it two thumbs up for reproducing the finest of sounds. However, pumping up the volume resulted in distortion that was disappointing. We did not expect it to hold its own against the monsters, but it did a pretty good job. The Philips A3.610 was another good entrant, but the flat panel satellites ruined the show when the volume was turned up. The subwoofer provided deep percussive beats, but the satellites sounded too harsh, and we had to turn it down almost immediately.

Our movie tests were a display of audio prowess. The Creative 5700D was unmatched by any speaker in terms of clarity and qual-

The 5.1 sets say "Cheese", as they pose for a photograph



The Woof of The Underdog

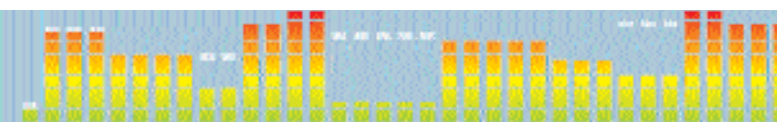
No true home-theatre system can ever be complete without the addition of a high quality powerful sub-woofer. Its ability to produce rich and powerful bass, and low frequency sounds, not only enhances the surround effect in a multi-channel setup, but also gives the listener a more realistic and satisfying audio experience. Also, with the presence of a special low frequency effects (LFE) channel in both the Dolby and DTS digital surround formats, the sub-woofer becomes an essential element in a high-end digital audio system.

Sub-woofers are very distinct from ordinary speakers in terms of functionality and design. They are designed to specifically reproduce sounds with frequencies 80 Hz and below, such as the rumble of thunder, the growl of a tank's engine or explosions. To produce such low frequency tones, the woofer's driver has to vibrate slowly, and therefore, is comparatively larger than the other speakers. Therefore, the diameter of a normal sub-woofer is within the range of 8 to 12 inches. More powerful sub-woofers, with power outputs of nearly 800 W, have drivers measuring almost 18 inches across.

However, the catch with larger drivers is that as their size increases, the amount of power needed to operate them increases too. This can be rectified to an extent by providing an amplifier in the sub-woofer unit itself, but then the costs shoot up astronomically.

ity of sound. These speakers are truly a delight to listen to when you play a DVD. Not even the Creative GD580 could match it in terms of audio reproduction. The Artis did a pretty good job, along with Odyssey. The Megaworks' missing tweeters could not match the 5700D in terms of clarity, but the thump at high volumes is enough to make you reel. The Philips A3.610 put up a magnificent display, but again went tinny when turned up.

In our music tests, while playing *With or Without You*, the Artis X10 produced bass with an almighty thump, but the satellites couldn't complement the subwoofer. When we turned up the volume, the subwoofer pumped the bass higher, but the satellites almost killed the song. Much higher power rated satellites are required. Next, we moved on to the Creative Megaworks 5.1 550. The higher you go, the better it sounds. The satellites and subwoofer are completely in-sync. And the song couldn't have been played on much a better speaker to realize the percussions that it has. The Adcom speakers suffered from the same problem as the Artis. Turn up the volume, and the neighbours are sure to dial 100 and report the massacre of their eardrums by the under-powered satellites. The Odyssey also crashed, and burned at higher volumes. Ditto for the Philips A 3.610. In fact, its cousin—the A5.600—did better than the sleek flat panel speakers.



1/2 pg VAD

Creative Inspire 5700D

Something for everyone

Creative's Inspire 5700D comes with an external Digital decoder, and is filled to the brim with features not seen on any other speaker in this comparison.

It comes in classy black, and has excellent build quality. The four satellites and the unusually large, curved centre speaker are made of plastic, but the sub-woofer is made of wood, lending great depth and punch to the bass. The sub-woofer isn't ported, and hence offers tight and deep bass output that doesn't distort at high volumes. The most enticing feature of this speaker is the supplied decoder. The decoder allows you to discretely control the output of centre and rear satellites, as well as the sub-woofer, thus offering better hardware control over various outputs. The 'Effect' button presents the select predefined modes of music, movie, four point and stereo. You can also choose between Dolby Digital, Dolby Pro Logic and DTS output. The decoder also has three types of inputs—Analogue, Digital DIN, and both SPDIF coaxial and Optical. All the connectors are gold plated.

A full-featured infra-red remote is bundled, and you can control all the features mentioned above with it. The package includes a Digital DIN cable, SPDIF Optical cable, coaxial cable, speaker stands and power adapter.

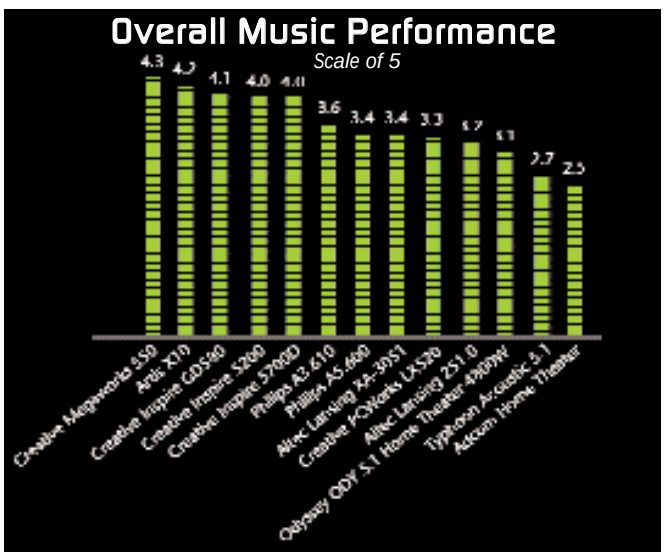
> There is accuracy in the sound; the bass and treble are clean. It is good for listening to music, watching movies and playing games. With six speakers and maximum total power-handling capacity, the sound is enough for your 10 x 12 sq ft room. If you are interested in clear sound reproduction, these speakers are the best.
>
> — NISSAR ALI CHIKATE

We connected the speaker using the SPDIF optical, as this offers the best quality. On the performance front, the speaker was simply fantastic. In the gaming tests, the bass was perfect, with not a hint of distortion—even at full volume. At high volumes, the highs seemed clipped. In the DVD test, the effects were superbly reproduced; but due to the limited RMS power, it was not as impressive as the Megaworks 550. In the music test, the overall frequency response was acceptable, especially the treble response. In the special frequency test, all tones were reproduced distinctly, without any audible harmonics.

At Rs 23,999, the Inspire 5700D is the same price as the Megaworks 550, which made our final decision harder. If you're a gamer, and want deep thumping bass, the Megaworks 550 is your answer. If you're an audiophile, nothing beats the versatility that the Inspire 5700D offers, with various input options and remote control.

Price: Rs 23,999
+ Superb clarity
– Comparitively low power

Creative Inspire 5700D	C-
Performance	
Features	
Build quality	
Value for money	



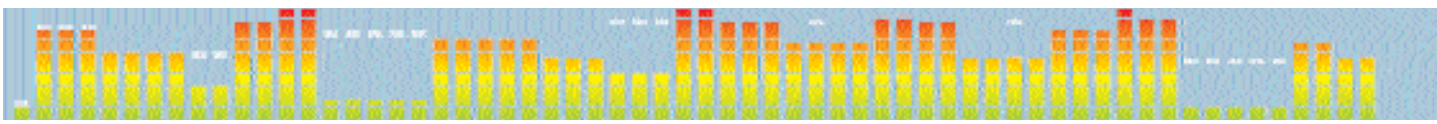
In the Hindi audio test, we just didn't want to test any other speakers after listening to the Creative 5700D play. If you overlook its lower RMS output, this is the perfect speaker system.

In the DVD-audio test, we had to connect to the analogue out of the DVD, and not the digital out. The Megaworks led the pack here, and the same went for the MP3 tests. There was only a difference of a couple of points between all the speakers.

The audio frequency file tests sent the entire test scurrying for ear plugs. The Philips duo shone in this category, and tied with the Creative and Altec Lansing speakers. The Adcom seemed to suffer from acoustic diarrhoea, and we got a few angry shouts from across the office.

Manuals and documentation

All the speakers that we received had some form or the other, of documentation—be it verbose manuals, or quick start guides. The Creative 5700D and the Creative GD580 had extensive manuals, in addition to the quick



Odyssey 4800 Watts 5.1

Almost famous

The Odyssey 4800 watts 5.1 speakers consist of five satellite speakers, a small wooden sub-woofer and an external amplifying unit.

The satellites are small and cube-shaped, with spring latches for the wiring. The sub-woofer was the smallest in the entire category and was flimsily constructed. The clumsy external amplifying unit has provisions for input and output connectors—input from the PC and output to the speakers. The unit offers discrete control knobs for all the channels, and a master volume knob and power switch. The connectors are properly marked for foolproof installation.

These speakers performed decently, displaying decent overall frequency response across the audible spectrum. In the gaming test, the higher frequency notes were distinctly reproduced, but the bass was lifeless, thanks to the ultra slim subwoofer. Of course, all this holds true for about halfway on the volume dial, after that, all you hear is distortion.

In the DVD video test, the effects were reproduced perfectly, but again the sound-quality lacked the depth for those heart stopping effects. In the music test, especially the Hindi audio-CD test, the reproduction was good. Though the MP3s sounded good, it wasn't the kind of experience you'd expect from 5.1 speakers.

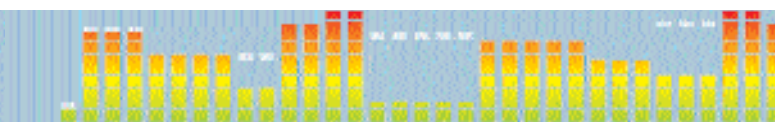
In the special frequency test, the speaker set gave decent audio output, reproducing each frequency with minimal harmonics. The subwoofer was the weakest link in the chain. Nevertheless at just Rs 2,800, if you want dirt cheap 5.1 speakers, with acceptable performance, look no further.

Price: Rs 2,800
+ Great value for money
– Shoddy build quality

Odyssey 4800 Watts 5.1	A-
Performance	
Features	
Build quality	
Value for money	

"Good at reproducing mid-range frequencies, and for MP3 or VCD audio. Listening to audio CDs or DVDs may not be a good experience. The audio reproduction is okay. With the help of the equaliser on the PC, the performance can be increased. But do not go beyond 10 KHz, it will add more hiss.."

— NISSAR ALI CHIKATE



SCORE BOARD

CATEGORY	5.1 SPEAKERS				
Brand	Adcom	Altec Lansing	Altec Lansing	Artis	Creative
Model	Home Theater	XA-3051	251	X10	Inspire 5700D
FEATURES					
Speaker Specifications					
Speaker Setup	5.1	5.1	5.1	5.1	5.1
Total RMS Power (W)	NA	56	60	210	78
Subwoofer (W)	NA	18.25	25	100	30
Centre (W)	NA	17.5	7	22	21
Satellites (W-per channel)	NA	5	7	22	7
Frequency response	40 Hz-20 KHz	32 Hz-18 KHz	35 Hz-18 KHz	140 Hz-22 KHz	35 Hz-20 KHz
External Decoder	✗	✗	✗	✗	✔
Remote (Wired/ Wireless)	✗	Wired	✗	Wireless	Wireless
Controls provided on speaker set / Remote control					
Volume / Bass / Treble / Surround Effects	✔/✔/✗/✔	✔/✔/✔/✔	✔/✔/No/✔	✔/✔/✔/✗	✔/✔/✗/✔
Build Quality (So5*)	3.5	4	3	4	4
Manual & documentation (Y/N)					
Listing of specifications / Quick setup guide / Troubleshooting	✔/✔/✗	✔/✔/✔	✔/✔/✔	✔/✔/✗	✔/✔/✔
Ease of Use (So5*)	2	4	2	4	4.5
PERFORMANCE (So5*)					
In-game audio quality					
AquaMark3 / Quake III	2.5 / 3	3.5 / 3.5	3 / 2.5	4 / 4.5	3.5 / 4
DVD Movie audio quality - VOB File	2.5	3	4	4	4
DVD-Audio: Treble / Vocals / Bass	2.5 / 2 / 2.5	3 / 3.5 / 3	2.5 / 3.5 / 2.5	2.5 / 3 /2.5	3.5 / 4 / 4.5
Audio CD quality					
English: Song 1 / Song 2	2.5 / 2.5	4 / 3.5	3.5 / 3	4.5 / 4	4 / 4
Hindi: Song 1 / Song 2	2.5 / 2.5	3 / 3	3 / 3.5	4 / 3.5	4 / 3.5
MP3 quality: Song 1 / Song 2	2 / 2.5	3 / 3	3 / 3	4 / 4	4 / 3.5
Special frequency test files - overall response	2.5	3.5	4	4.5	4
Ultimate Bass Test / Ultimate Treble Test	2.5 / 2.5	3 / 3.5	3.5 / 3.5	3.5 / 4	4 / 4
OVERALL SCORE					
Performance	35	46	45.98	56.23	53.35
Features + Ease of use + Documentation	13.7	21	15.5	21.55	27.35
Grand Total (Performance + Features)	48.68	67	61.43	77.78	80.7
VFM (So5*)	2.5	2	2	1	1
Prices (Rs)	4,050	11,250	7,000	18,000	23,999
Grade	B	C	C	C	C

** Scale of 5*

start guide. However, the Odyssey and the Typhoon had pretty flimsy documentation; the manuals that came with the speakers were capable of hand-holding even a first-time user.

Features

In this department, some speakers definitely had something to show off. The first thing that strikes you about the Artis X10 is the size of the sub-woofer. Featuring a 12-inch woofer in a wooden cabinet, it is as heavy to pick-up as it looks. Artis has gone the whole hog with these speakers providing a wireless remote, which controls the motorised main volume dial on the subwoofer. The Creative GD580 and the Creative 5700D feature external decoders for DTS, Dolby Prologic and Dolby 5.1 decoding, and also wireless remotes that can be used to control the decoder.

The Adcom set has an external volume control, which had several controls, including those for the bass, centre and rear speakers. The control box looks neat, but doesn't really match up to the gizmo-*ish* looks of the Creative 5700D external decoder. The Altec Lansing XA-3051 features a wired remote, which has different modes for gaming, music and surround. Fader controls are on the pod, so you can control the rear and front channel volume. The Megaworks monsters missed out on the features part as they only had raw RMS power, but no digital connectors. The Philips set was pretty good with a wireless remote control, but that's about all it offered. The other speakers were the usual run-of-the-mill.

Contacts	Adcom	Altec Lansing	Artis	Creative	Frontech	Intex	Odyssey	Philips	Typhoon
	Advantage Computers	Zeta Technologies	Kunhar Peripherals P. ltd	Creative Technology Ltd	Jupiter International	Intex Technologies Ltd	Compuage Infocom Ltd	Philips India Ltd	Hitech Computers
	011-51618611	022-24102288	022-56345758	98203 57713	022-22001211	011-51610224	022-23842200	9520-27124196, 27120541	080-23442948
	info@adcomIT.com	tejas@zetaindia.com	salesbom@kunhar.com	rajshekhar_bhatt@ctl.creative.com	frontech@bom5.vsnl.net.in	info@intextechnologies.com	mehul@compua-geindia.com	pss.sales.marketing@philips.com	blr@hitechit.com
	www.adcomit.com	www.alteclansing.com	NA	www.creative.com	NA	www.intextechnologies.com	www.compua-geindia.com	www.philips.com	www.hitechit.com

5.1 SPEAKERS

	Creative Megaworks 550	Creative Inspire 5200	Creative PCWorks LX520	Creative Inspire GD580	Odyssey ODY 5.1	Philips A5.600	Philips A3.610	Typhoon Acoustic 5.1
	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
	500	47	46	47	NA	100	200	100
	150	17	16	17	NA	50	100	20
	70	6	6	6	NA	10	20	16
	70	6	6	6	NA	10	20	16
	25 Hz-20 KHz	40 Hz-20 KHz	40 KHz-20 KHz	40 Hz-20 KHz	20 Hz-20 KHz	40 Hz-20 KHz	40 Hz-20 KHz	30 Hz-18 KHz
	✗	✗	✗	✔	✗	✗	✗	✗
	Wired	Wired	✗	Wireless	✗	Wireless	Wireless	✗
	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✗ / ✗	✔ / ✔ / ✗ / ✗	✔ / ✔ / No / ✔	✔ / ✔ / ✗ / ✗	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✔ / ✔	✔ / ✔ / ✗ / ✔
	4	3.5	3.5	4	2.5	3.5	3.5	
	✔ / ✔ / ✗	✔ / ✔ / ✗	✔ / ✔ / ✗	✔ / ✔ / No	✔ / ✔ / ✗	✔ / ✔ / ✗	✔ / ✔ / ✗	✔ / ✔ / ✗
	4.5	4	4	4	2.5	4	4	2.5
	4 / 4	3.5 / 4	2.5 / 3.5	3.5 / 3.5	2.5 / 2	3.5 / 3.5	3 / 3	2 / 2
	4.5	3.5	3.5	3	3	3	2.5	2.5
	4 / 4 / 3.5	4 / 4 / 3.5	3 / 3 / 2.5	4 / 3.5 / 4	3 / 2.5 / 2.5	3.5 / 3/ 2.5	3 / 3 / 4	2.5 / 3 / 2.5
	4.5 / 3.5	4 / 4	3 / 3	3.5 / 4	3 / 3	3.5 / 3.5	3 / 3	2.5 / 2.5
	4.5 / 4	4 / 3.5	3.5 / 3	3.5 / 4	3.5 / 3.5	3.5 / 3.5	3.5 / 3.5	2.5 / 2.5
	4.5 / 3.5	4 / 3.5	3.5 / 3.5	4 / 4	2.5 / 2.5	3.5 / 3.5	3.5 / 3.5	2.5 / 2.5
	4	4	4	4	3.5	3	4	3.5
	4 / 3.5	3.5 / 4	3 / 3.5	3.5 / 4	2.5 / 3	2.5 / 3	4 / 3.5	2.5 / 3
	56.98	53.35	45.79	50.56	39.33	42.89	47.82	36.97
	20.95	19.05	14.35	25.45	14.75	23.8	21.85	14.15
	77.93	72.4	60.14	76.01	54.08	66.69	69.67	51.12
	1	3	2.5	1	4	1.5	1	3
	23,999	5,300	4,800	16,000	2,800	8,995	13,995	3,100
	C	B	B	C	A	C	C	B+

Jargon Buster

Root Mean Square (RMS): The sustained power in Watts that an amplifier can output at any given time.
Peak Music Power Output (PMPO): It's the maximum power that an amplifier can output for a short period of time.
Frequency Response: It is the range of frequencies that the device is set to operate within.
Dolby Digital 5.1 (Dolby AC-3): Developed by Dolby, this system has five discrete sound channels, in addition to Low Frequency Effects (LFE) that are directed to the sub-woofer.
Dolby Pro Logic: An older standard, this packs in information for a centre and surround channel in the normal stereo channel. Essentially, there are no discrete left and right channels for the rear or surround speakers.
Dolby Pro Logic II: Audio encoded with Pro Logic II carries five channels of sound in a traditional two-channel stereo audio signal, which is then decoded back to five speakers using a Dolby Surround Pro Logic II decoder. This technology can be used on any console that does not support Dolby Digital 5.1. The advantages of using it in game applications include minimal latency, full frequency range, compatibility with existing cables and backwards compatibility with mono, stereo and legacy Dolby Surround Pro Logic equipment.
DTS: Short for Digital Theatre Systems, this is a standard invented by Steven Speilberg and made its debut in *Jurassic Park*. It uses a sampling frequency of 96 KHz with 24 bits allocated to each of the six channels. Collector's edition DVD movies normally feature two soundtracks featuring both, Dolby 5.1, and DTS.
Dolby Digital EX and DTS ES: These are comparatively new standards that add an additional channel, which is the rear centre channel and is implemented in 6.1 speakers. Both the standards implement the rear channel somewhat similarly. For Dolby Digital EX, a special Dolby Pro Logic decoder is added to the surround channels creating a rear centre channel. This decoding method first came to light with the theatrical release of *Star Wars Episode 1*. For DTS ES, an additional rear centre channel is supplemented to the two surround channels.
Dolby Pro Logic IIx: This is a spanking new technology developed by Dolby Laboratories and is the first and only technology to process native stereo or 5.1 signals into 6.1 or 7.1 channel output. Different modes such as movie, music and game are available with this technology with the music mode featuring additional user controls such as Dolby centre width, Dolby panorama, and Dolby dimension.
THX: This is an abbreviation for Tomlinson Holman's eXperiment. It's not a surround sound standard but a seal of approval that is granted to audio equipment and theatres that meet its standards. This standard is further divided into THX Select (for installations upto 2000 cubic feet) and THX Ultra (2000-3000 cubic feet).
Sony Dynamic Digital Sound (SDDS): This proprietary Sony format provides up to eight channels of discrete sound. Sony designed this exclusively for motion picture theatres.

"This (Creative Megaworks 550) is a powerful PC sound station. If you like to listen to loud music, then this can handle about 500 W RMS output. Because of its steady and powerful bass, it does not give the clear picture of sound. Needs more pre-emphasis to increase the highs in the range of 3 KHz till 15 KHz to get clearer sound. Playing games and watching action movies on this will be a great experience."

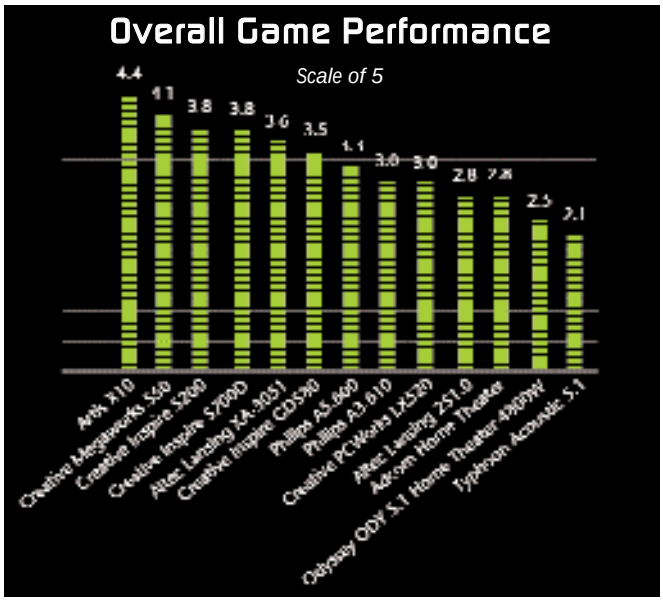
— NISSAR ALI CHIKATE

Ease of use

While most of the speakers were easy to set up, the Creative GD580 and the 5700D took a little longer as they had various input options, and we couldn't resist trying each one out. The Creative 5700D took the longest—it has a complicated decoder configuration. The other speakers were literally plug-and-play, and the average time taken per set was about 15 minutes—including unpacking the speakers from the box!

The Odyssey and the Typhoon definitely need to provide a remote. The Artis has bass and rear controls on the back, but the remote feels like it would shatter if you dropped it. The Megaworks remote remembers settings if you leave the speaker on, and leave the remote on standby. However, the settings are reset if you power down the speakers. Resetting every time you power up just eats into precious time that could be better utilised lazing on the couch!

After all the trials and tribulations were over, we finally settled down to choosing the winners. The Odyssey walked away with the Value for Money prize, for a decent performance, reinforced by a killer price of just Rs 2,800. Deciding on the performance winner was much tougher. After hours of heated debate, we decided that the Creative Inspire 5.1 5700D deserved to win. The Creative Megaworks and the Artis X10 were way ahead in terms of raw power, but it was the clarity of the Creative 5700D that grabbed it the title.



Creative Inspire 6600 6.1 speakers

Big boom

Creative's Inspire 6600 speakers are a treat for sound enthusiasts. The set consists of six plastic-bodied satellite speakers and a ported, wooden sub-woofer. The extra rear centre speaker brings an amazing audio realism to DirectSound 3D games, Dolby Digital EX DVD movies and digital music over a standard 5.1 speaker set.

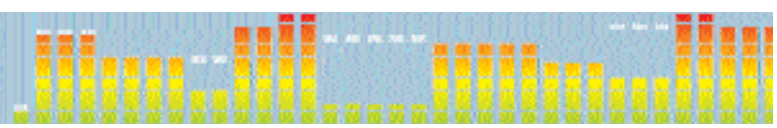
If you have a 5.1 sound card, the up-mix control switch on the sub-woofer allows you to create a 6.1 sound environment. The speakers have an aesthetic appeal that adds value to the decor of the room—for a change, the woofer doesn't need to be hidden away. The stand for the centre-channel speaker is designed specially to be placed on the monitor, so that the speaker aims downwards. It also comes with a replacement stand. Colour-coding makes speaker installation a breeze. Wires are long enough for you to place your speakers conveniently as per your preference.

The game test saw the speaker give a reasonably good audio output. The highs and the bass were reproduced perfectly without much distortion. The speaker set holds all the thuds well up to 70 per cent of the total volume range, after which distortions are hard to miss. However, the Inspire 6600 reproduces effects perfectly providing immersive game play. In the DVD video test, the effects were good, but some how the sub-woofer felt under-powered as compared to other high-end sets from Creative. Music test proved to be easy going on these speakers and it reproduced most of the audible spectrum perfectly. The boom from the sub-woofer has good depth, and does not turn annoying by being too loud. Vocal clarity was commendable, so was the distinctness of the instruments.

At Rs 8,600, the speakers are reasonably priced. Utilising them to their full potential will require you to upgrade to a 6.1 channel sound card.

Price: Rs 8,600
+ Excellent reproduction of effects
– Needs a better remote control

Creative Inspire 6600 6.1	B
Performance	
Features	
Build quality	
Value for money	



Creative Inspire T7700

Seven for the big blow

The Creative T7700 is the first 7.1 speaker set, and the only one to take part in this comparison. It comprises seven satellites and one wooden sub-woofer for a deep punchy bass. The front three satellites are two-way speakers, with a tweeter and a separate mid-range, whereas the rest make do with just a full-range speaker. A sleek wired remote control featuring bass, master volume/on-off controls, a line-in and a headphone jack is provided. Apart from these, a new connector, M-port, which allows you to connect a Creative MP3 player such as MuVo-NX, etc, to the speakers directly, also makes its way on this cute remote.

To test these speakers, we used the Creative SoundBlaster Audigy 2 ZS Platinum Pro since it offers a 7.1 output jack. An extensive setup guide helps you get the set up without any fuss. The rear and side satellites have cables long enough to be placed according to your listening preferences.

The performance was a mixed result. The highs and mid-frequencies were reproduced excellently. However, at 24W RMS, the sub-woofer lacks depth and punch. Bass was clean and undistorted, as long as the volume knob did not cross the 70 per cent mark. Thereafter, distortions were clearly heard.

In the game tests, the speakers reproduced excellent sound in *AquaMark 3*, but *Quake III* sounded rather dull. The effects are sure to make you jump out of your skin on a quiet, silent night!

Results in the music tests ranged from average to good. Sound reproduction is good, but becomes sharper at high volumes, indicating the tweeters going overboard. It's a pleasure to watch a DVD movie—the sound just wraps you like an envelope, but only if the speaker placement is properly planned.

Priced at Rs 11,900, the Inspire T7700 is reasonably priced. However, you need a 7.1 capable card to exploit its full potential. We recommend this speaker set to those who like watching DVDs with full effects and aren't bothered by the lack of a thundering bass. If you are a gamer or a music lover though, give this set a miss.

> "Though there are seven speakers in total, they do not have impressive sound quality. They do not create surround sound at all; They sound muffled at certain low frequencies. There are better sounding speakers in 4.1 and 5.1, why do I need 7.1?"
>
> — NISSAR ALI CHIKATE

Price: Rs 11,900
+ Good build quality
– Subwoofer lacks punch, effects not reproduced properly

Creative Inspire T7700	B
Performance	
Features	
Build quality	
Value for money	

Wired for Sound

You've just received your dream system—for which you scrounged and scrimped every single *naya paisa*—and you're on cloud nine. However, as you open the box, your ecstasy quickly dies away, as all you can see besides the speakers is a large bunch of wires with pins at their ends, and a bunch of tiny holes to stick them into. What goes where?

Analog cables: These connectors are the most common interconnect links, primarily used to carry analogue audio signals. They connect low-end soundcards, as well as televisions, VCRs and CD players to the speakers. At times, one end of an analog cable sports an RCA connector that's generally smaller than the standard analog connector. This may occur in a powered sub-woofer.

Coaxial cables: Coaxial cables are a combination of two cables—one running through the centre of the other—separated by a non-conducting jacket. Coaxial signals carry digital signals very efficiently, and hence, are used in the newer 5.1 and above sound cards. All coaxial cables feature an F-connector at one end. Similar to a cable-TV connector, it is usually linked in tandem with a DIN connector.

Optical cables: This is the latest type of connector, and utilises fibre-optic technology to transmit audio signals. Though very thin, these cables are very efficient in carrying digital audio signals. These are commonly used to connect DVD players, and game consoles.

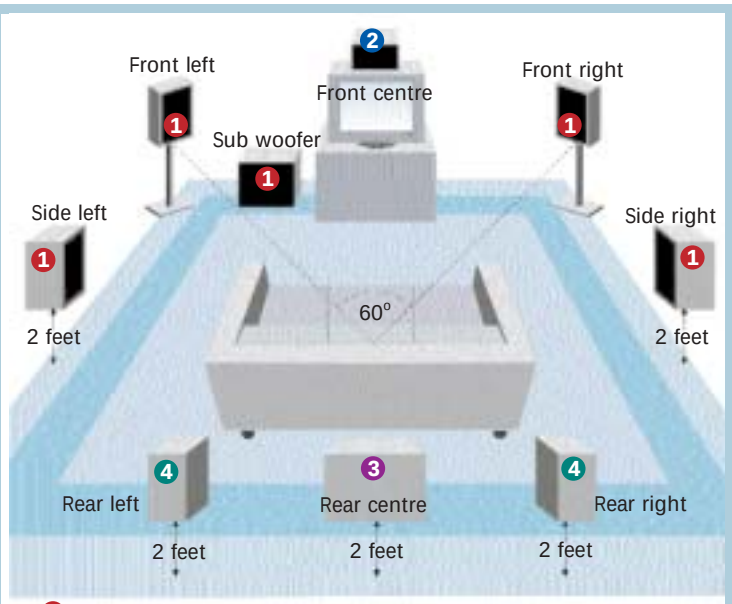
Sound Spots

If you are the only person using the system, make sure that you sit equi-distant from the left, centre and right speakers. If you always have friends over, then arrange the speakers in a straight line. Avoid placing the centre speaker closer to the listeners than the left and right ones.

The left speaker should make an angle of 25 to 30 degrees from the centre, with respect to the listener, as should the right speaker. We recommend a wider angle, with the left and right speakers further apart, if you use your system mainly to listen to music. Also, the three front speakers should be as close as possible to ear-level.

Place the surround speakers alongside and slightly to the rear, but not exactly behind the listener. The surround speakers should be at least about 2 to 3 feet above the listener's head.

As for room acoustics, make sure that there are not too many smooth or hard surfaces that cause reflections. This harshens and muddles the sound. Carpeting and draping is a solution. Avoid rooms that are perfectly square, since they have a noticeable resonant effect. Increase the bass output by placing the sub-woofer at corners formed by the intersection of walls, ceilings and floors.



1 For 4.1, 5.1, 6.1, 7.1 connect this satellite
2 For 5.1, 6.1, 7.1 connect this satellite
3 For 6.1 connect this satellite
4 For 7.1 connect this satellite

Decision Maker

	Price conscious	Prudent	Enthusiast
You need	A reasonably good speaker set that offers surround sound functionality with a good balance between performance and price	You want an extremely good sound experience without splurging a lot of money	A system with no-holds-barred performance and state-of the art features plus support for all the latest consumer audio standards. Price no bar; Experience? Out of this world!
Look for	A 4.1 setup that will provide you with an engaging experience without being tough on your pockets	A 5.1 setup that will please your senses but may pinch your budget just a little bit	A setup that will simply amaze you with it's clarity and power
Our pick	Creative Inspire 4400, Artis S400	Altec Lansing 251, Creative Inspire 5200, Odyssey 5.1	The Creative Megaworks 550, Altec Lansing X10, the Creative Inspire 5700D, GD580, or Creative Inspire T6600 6.1
Price	Upto Rs 4,500	Upto Rs 10,000	Above Rs 15,000

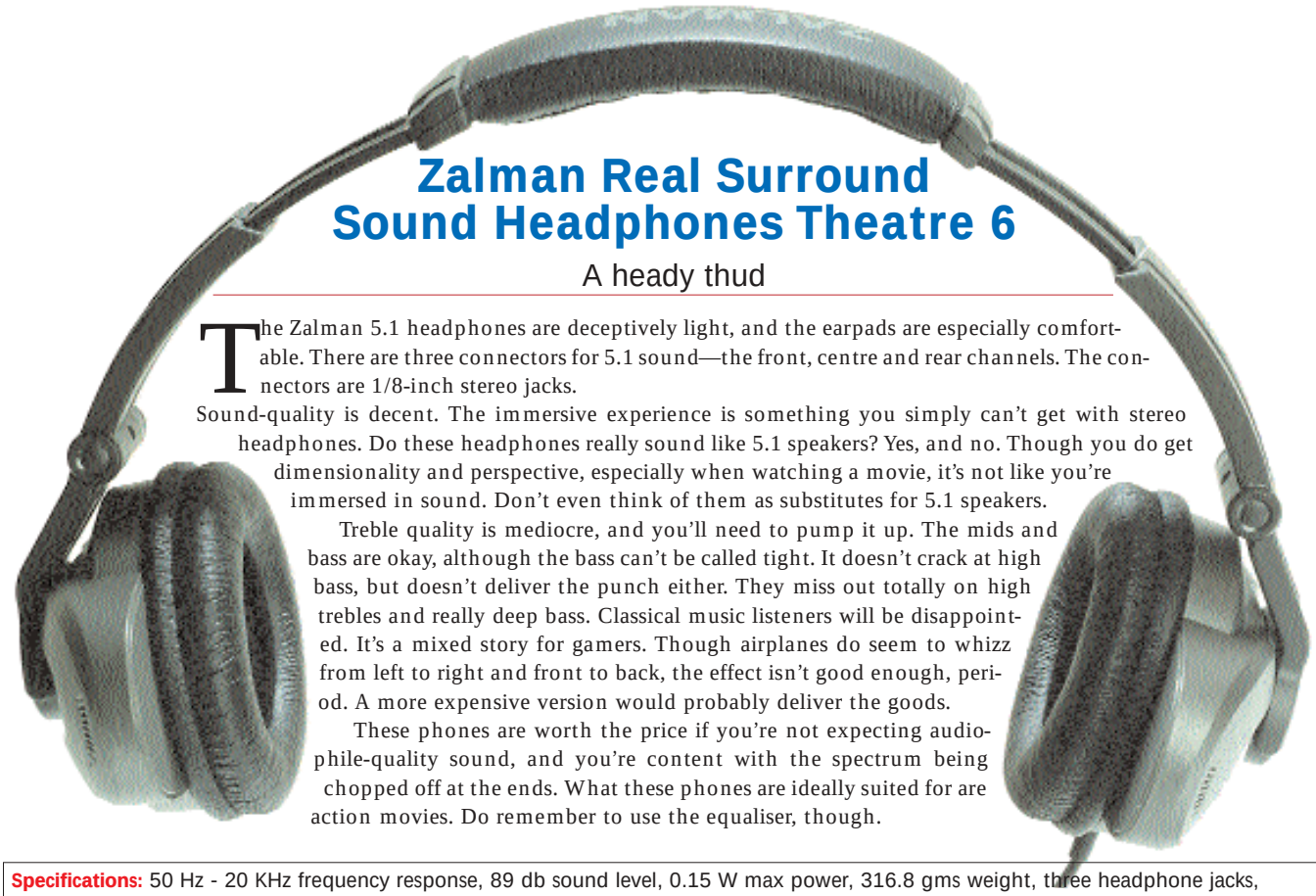
Conclusion

With the sound wars done with, not to mention the loss of hearing that we continue to suffer, it's time to reflect on the results.

Sound is a very personal, and subjective thing. What may sound harmonic to one, may be another's nightmare. These tests, and their results, give you an insight on each speaker's quality and overall performance. The lesson learned: A good speaker always sounds better when compared to others. However, that does not mean that the rest are bad! There are a lot of components involved in the whole scene such as the sound card, your room and the speaker placement that are conducive to a good experience.

A surround setup consisting of at least 4.1 speakers is necessary to watch movies, or listen to music. However, that's being phased out as all the channels are mixed to provide the surround experience. 7.1 systems have yet to come of age, and can be considered an overkill, while 6.1 are still being eyed skeptically. Media that will take advantage of such features is yet to be available in the market. And by the time it is, there will be more players in the same segment, and fiercer competition too. The 5.1 setup, at this point of time, is more than enough for your aural senses. Currently, this setup is a point of reference for all home-theatre manufacturers. Thus, it makes sense to opt for a 5.1 today. For the future, there is a lot more to come.

>> That Extra Zing



Zalman Real Surround Sound Headphones Theatre 6

A heady thud

The Zalman 5.1 headphones are deceptively light, and the earpads are especially comfortable. There are three connectors for 5.1 sound—the front, centre and rear channels. The connectors are 1/8-inch stereo jacks.

Sound-quality is decent. The immersive experience is something you simply can't get with stereo headphones. Do these headphones really sound like 5.1 speakers? Yes, and no. Though you do get dimensionality and perspective, especially when watching a movie, it's not like you're immersed in sound. Don't even think of them as substitutes for 5.1 speakers.

Treble quality is mediocre, and you'll need to pump it up. The mids and bass are okay, although the bass can't be called tight. It doesn't crack at high bass, but doesn't deliver the punch either. They miss out totally on high trebles and really deep bass. Classical music listeners will be disappointed. It's a mixed story for gamers. Though airplanes do seem to whizz from left to right and front to back, the effect isn't good enough, period. A more expensive version would probably deliver the goods.

These phones are worth the price if you're not expecting audiophile-quality sound, and you're content with the spectrum being chopped off at the ends. What these phones are ideally suited for are action movies. Do remember to use the equaliser, though.

Specifications: 50 Hz - 20 KHz frequency response, 89 db sound level, 0.15 W max power, 316.8 gms weight, three headphone jacks, 300 cm long cord ■ **Price:** Rs 2,995 ■ **Contact:** Mediatech India ■ **Phone:** 022-26361111 ■ **E-mail:** info@mediatechindia.com ■ **Web site:** www.zalman.co.kr ■ **Overall Rating:** ★★★☆☆

Control your Remotes

Home theaters have hit the Indian entertainment market, and they're here to stay. Very soon, you're going to be stuck with more remote controllers than you can manage—for your TV, DVD, receiver, speaker set, etc. This is where a true programmable, universal remote comes in. One unit that you can control all your gadgets with, and not sacrifice on functionality. Universal remotes are programmable and can be made to learn the signals of even the most obscure features. So, you can finally do away with the heap of remotes.

The universal remote (marked with a red circle) has a button that allows you to choose the device to control. In order to program the universal remote, you need to place the device's remote and the universal remote with their IR sensors facing each other. Now, you press the Learn key on the universal remote, then the button you want to define, followed by the corresponding key on the devices remote. An indicator on the universal remote lights up to tell you that the signal has been received. Repeat this procedure for all the keys of the device's remote that you want the universal remote to learn, and you're done.

You can even get advanced universal remotes that boast of an LCD display and better programming features, to make life easier.

Samsung LS17E34C LCD TV

Two for the price of two

The sleek-looking Samsung LS17E34C LCD TV is both—an LCD monitor and a TV, with connector slots for TV antenna, DVD, VCR, and any other A/V device. And it comes equipped with Dolby surround sound, making the audio experience as good as the video.

Setting up the TV function on the LCD is a simple, one-step process—all you do is plug the cable into the back panel, and start the channel scan. It lets you scan the available channels and auto-store them. Of course, you can also manually sort them in any order. It also lets you rename channels with a mnemonic, which means you can name your sports channel Tendulkar, or your movie channel, Shahrukh.

You can choose from four pre-defined picture standards—Dynamic, Standard, Movie and Custom. Besides this, you can also view it in the default 4:3 mode, or magnify it, or even switch to the 16:9 wide mode. This is useful specially while switching from TV to DVD mode.

The Picture-in-Picture (PIP) function allows you to watch a movie even as you work on the PC. The PIP feature comes with three window sizes.

It would be worthwhile to mention a design hitch: The LCD's control buttons are provided on the top, making it cumbersome to reach and adjust. This is partly fixed by the multi-function remote. It comes with a Kensington lock to make it theft proof, a device sorely needed for an expensive lifestyle product like this.

■ **Specifications:** 17-inch screen, 140 x 125 viewable angle, 1280 x 1024 at 75 Hz display resolution, built in TV tuner, HDTV, Virtual Dolby Surround, 58W power consumption, 7.7 kg with stand
■ **Price:** Rs 74,990
■ **Contact:** Samsung India Electronics Ltd
■ **Phone:** 011-51511234 ■ **Fax:** 011-51608818
■ **E-mail:** digimax@samsungindia.com
■ **Web site:** www.samsungindia.com
■ **Overall Rating:** ★★★★☆

Philips Micro Hi-Fi System MC-i200

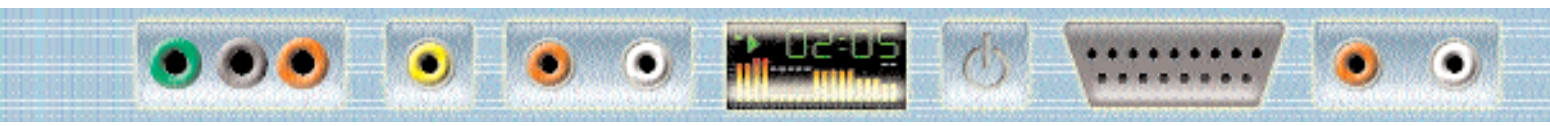
Music from the Net

■ **Specifications:** 1500 W PMPO, 70 signal-to-noise ratio, 50-16,000 Hz frequency response, RJ45 input jack, FM, AM, MW player, three-way bass reflex system
■ **Price:** Rs 34,990
■ **Contact:** Philips India Ltd
■ **Phone:** 022-5691-2331, ■ **Fax:** 022-26879276
■ **E-mail:** r.datta@philips.com
■ **Web site:** : www.philips.com
■ **Overall Rating:** ★★½☆☆

The Philips Micro Hi-Fi system MC-i200 plays streaming media live from the Internet, apart from AM or FM radio and the mandatory audio and MP3 CDs. It has a five-line display, a neat button layout and one-touch keys such as PC link, CD, Tuner, Connect, etc. It needs Internet connectivity to play streaming music with the help of the LAN connector. A simple process helps you configure networking details such as IP address, subnet mask, etc without much of a hassle. Choose one of the many streaming Web sites that its panel displays to listen to music of your style. You can also configure its MyStreams section at my.philips.com to suit your musical tastes.

The audio player can also play streams sourced over your own LAN network using Philips PC-Link software. Sans the LAN, you end up paying more for features you are never going to use.

Quality-wise, this system is as good as any other audio player. However, the maximum volume level seems to be a little low. At this price tag, you may be better off buying a full-featured music system or a home theatre, or even a PC with a 5.1 speaker setup.



MSI Mega PC 180

Mini-entertainment-gaming-arsenal

MSI entertainment and gaming appliance (MEGA) are series of small form factor bare-bone PCs. Mega PC 180 is a complete new product, re-defining the future of bare-bone PCs.

The Mega 180 is encased in an elegant, jet-black casing. The front bezel incorporates a colourful LED panel, similar to ones found on a consumer audio product. What differentiates the Mega 180 from other bare-bones is the fact that you can use it as a stand-alone audio appliance that can play audio CDs, MP3 CDs and AM/FM radio without switching on the PC.

The play, pause, forward, reverse and mode buttons are provided just below the LED panel for easy access. Two buttons let you toggle between the Hi-Fi mode and the PC mode. A 6-in-1 card-reader is placed below the LED panel. A push button smoothly opens a plastic flap to reveal two USB, two Firewire and an SPDIF optical-in ports at the bottom of the front bezel. The optional TV-tuner card can be controlled by the accompanying system remote.

The Mega 180 is based around an nForce2 chipset supporting AMD Athlon XP 3000+ and DDR 333 via two memory slots. It offers a dual-monitor out to connect two monitors. The board offers an 8X AGP slot and a PCI slot for add-on cards. Installing current-generation video cards will leave no space for any PCI card to be plugged into the PCI slot. The back panel has four USB ports, an Ethernet connector and six-channel audio with SPDIF optical-out. For efficient cooling, MSI has provided custom-made full copper heat sink with two lateral fans. The sides of the casing are perforated for better air circulation. The interiors are cramped, and installing drives is a cumbersome job.

The nForce2 does not disappoint and like all MSI motherboards handles system-intensive applications very well. Priced at Rs 19,000, the Mega PC 180 is definitely expensive, but it's the only one of its kind available in the market today and this exclusivity is what the price is about.

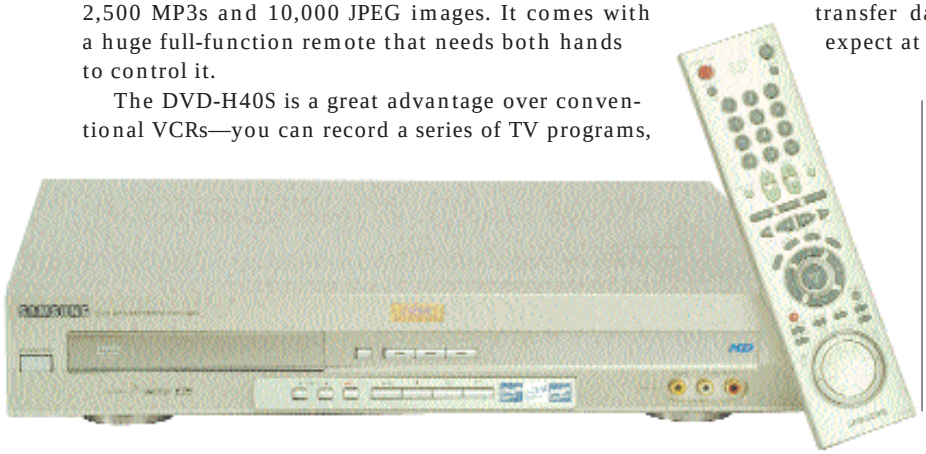
- **Specifications:** nForce2+MCP-T chipset, six USB ports, two Firewire ports, AM/FM tuner, MP3 player and optional TV-tuner card
- **Price:** Rs 19,000
- **Contact:** Cyberstar
- **Phone:** 080-51144075 ■ **Fax:** 080-22236781
- **E-mail:** narend@cyberstarin.net ■ **Web site:** www.msi.com.tw
- **Overall Rating:** ★★★½☆

Samsung DVD HDD Recorder DVD-H40S

Move away VCR

The DVD-equivalent to a VCR, the Samsung DVD-H40S plays DVDs, and stores programs, images, etc, on its inbuilt 40 GB hard disk. It has a friendly GUI that lets you choose between two storage modes—40 hours of video, 250 MP3s and 10,000 JPEG images, or 30 hours of video, 2,500 MP3s and 10,000 JPEG images. It comes with a huge full-function remote that needs both hands to control it.

The DVD-H40S is a great advantage over conventional VCRs—you can record a series of TV programs, and start watching stuff while it's still recording. Record videos at 2, 4 and 6 Mbps. The video output is excellent. It has optical and co-axial digital output ports, plus input ports for a camcorder, VCD, VCR and sound system. The only drawback is the lack of CD or DVD-writing support, and an interface to transfer data to and from a PC—something one would expect at Rs 45,000.



- **Specifications:** DVD, VCD, MP3 and CD playback, Dolby Digital and DTS support, 40 GB hard disk, video-in/out jacks, component video-out jacks, S-video in-out jacks, one digital optical audio out, one digital coaxial audio out, RF antenna input and output
- **Price:** Rs 44,990
- **Contact:** Samsung Electronics India Ltd
- **Phone:** 011-51511234
- **Fax:** 011-51608818
- **E-mail:** digimax@samsungindia.com
- **Web site:** www.samsungindia.com
- **Overall Rating:** ★★★½☆

Philips DVD Video Digital Surround System MX5700D

Just like the movies

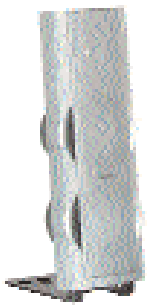
The Philips MX5700D is a five-DVD and CD home entertainment system, comprising five speakers and twin tower sub-woofers plus the main unit. The system plays DVDs, VCDs, SVCDs, DVD+RW, audio CDs, MP3s and mixed mode CDs. An interesting feature is the provision of a media slot that reads MP3s or JPEGs off memory cards using a PCMCIA adapter.

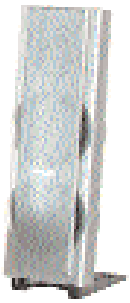
The front two speakers are clipped on to the top of the twin tower sub-woofers. The sleek centre and rear speakers definitely have the flair to add that extra bit to your décor. They are provided with long colour coded wires, making the installation foolproof and fuss-free.

The main unit has five flimsy individual disc trays placed vertically on the left side. Centrally placed is a display-dial for speaker output. The system status dial displays information on active media source, volume level, clock, etc. Next to it are nine buttons that enable one to control various features such as FM tuner, surround sound, playback control, etc. Two large backlit knobs for volume control and source selection are provided at the extreme right.

All standard playback features are available for DVDs, including sub-title selection, slow motion, fast forward, reverse, and title search. Use the media slot to view captured images on the TV directly. You need a 4-in-1 PCMCIA adapter to use Compact Flash (CF), memory stick, Smart Media (SM), Secure Digital (SD) or MultiMedia Cards (MMC) with the system. You can also play MP3 files off memory cards.

Performance-wise, the Philips MX5700D delivers crisp and clear picture quality accompanied by great sound. Though bass is a tad weak, the overall sound quality is great. The MX5700D is a good home entertainment package, especially if you consider its features and ease of use.





■ **Specifications:** 5-DVD/VCD changer, media slot, FM-tuner, Dolby Digital and 7200-watt PMPO surround speakers
■ **Price:** Rs 34,990
■ **Contact:** Philips India Ltd
■ **Phone:** 022-56912331
■ **Fax:** 022-26879276
■ **E-mail:** r.datta@philips.com
■ **Web site:** www.philips.com
■ **Overall Rating:** ★★★½☆

MSI DR4-A Dual DVD-Writer

Burn those DVDs

The MSI DR4-A DVD writer can write DVD±R, DVD±RW, CD-R and CD-RW, and read them all. Bundled along are the Nero CD-writing software, Sonic MyDVD, PowerDVD, Showbiz video-editing software, an audio cable and manuals.

This drive burns data at the speed of 4X on DVD-R in around 13 minutes, making it a fast burner. Record more than five hours of content on a single DVD that will otherwise take up at least three VCDs. An advantage of DVD media is that movie-quality is much better than on the VCD, since there's more space to fit the content.

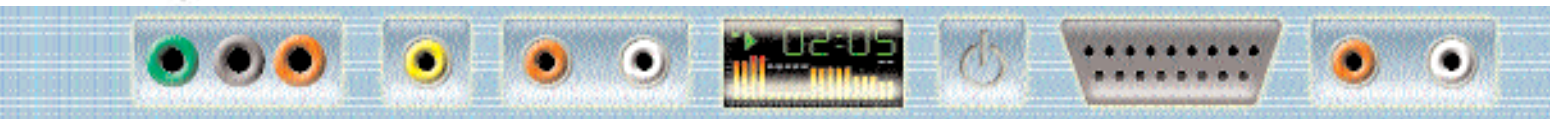
The drive burns DVD-RW at 2X. It just took 23 minutes to burn 4.5 GB of data on a DVD+RW, at a speed of 2.4X—23 seconds more than the Lite-On 811s.

The MSI DR4-A Dual Writer erases data just as fast. It wiped data off the DVD+RW in just 24 minutes 6 seconds—36 seconds lesser than the Lite-On 811s.

Affordably priced at Rs 10,000, it makes a good investment if you watch a lot of DVD movies, burn tons of data, archive images and songs and convert camcorder tapes to digital content.

■ **Specifications:** 8 MB buffer, HD-Burn support, EIDE interface, speeds: CD-RW: 10X, CD-R: 24X, CD-ROM: 40X, DVD: ±R 4X, + RW 2.4X, - RW 2X, DVD-ROM: 12X
■ **Contact:** Cyberstar
■ **Phone:** 080-51144075
■ **Fax:** 080-22236781
■ **E-mail:** narend@cyberstarin.net
■ **Web site:** ww.msi.com.tw
■ **Overall Rating:** ★★★½☆

DIGIT TEST CENTRE
testcentre@thinkdigit.com



The A-List

The best products in different hardware and software categories

Products that topped our performance tests

CPU
AMD Athlon64 FX-51
+ Great performance with multi-media applications
- Expensive
Contact: Tech Pacific
Phone: 022-55960101
E-mail: pratik.chube@techpacindia.com
Price: Rs 45,000

Motherboard
MSI 875P Neo
+ Terrific performance and equally good features
- Bad component layout
Contact: Cyberstar
Phone: 080-2276986
E-mail: narend@cyberstarin.net
Price: Rs 15,000

Primary Storage
Maxtor 250 GB MaxLine Plus II
+ Tons of space
- Gets heated
Contact: Cyberstar
Phone: 011-6438216
E-mail: yogi@maxtor.com
Price: Rs 20,100

Secondary Storage
Combination Drive
Sony CRX 300A
+ Top performance, vertical mountable, half height, Mt. Rainer support
- No CD-R or CD-RW media
Contact: Rashi Peripherals
Phone: 022-28260258
E-mail: ho@rptechindia.com
Price: Rs 3,800

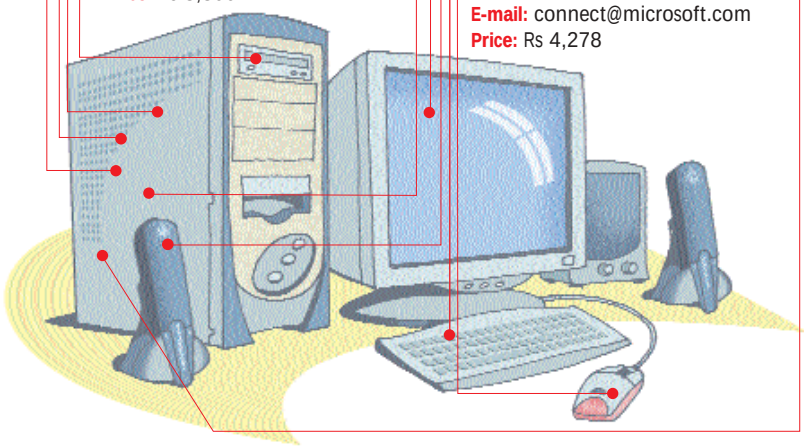
Graphics Card
Gainward GeForce FX 5950 Golden Sample
+ Extremely good performance
- Expensive
Contact: Mediatech India
Phone: 022-56396696
E-mail: sales@mediatechindia.com
Price: Rs 34,975

Display
LCD Monitor
SONY SDM-N80 18.1-inch
+ Stylish, great performance
- External power supply takes up extra space
Contact: Rashi Peripherals
Phone: 022-28260258
E-mail: ho@rptechindia.com
Price: Rs 1,47,000

Speakers
Creative Inspire 5700D
+ Crystal clear sound reproduction
- Will not be able to shake the room
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshekhar_bhatt@ctl.creative.com
Price: Rs 23,999

Input Devices
Microsoft Multimedia Keyboard
+ Great feel
- Expensive
Contact: Microsoft Corporation
Phone: 011-26294600
E-mail: connect@microsoft.com
Price: Rs 1,498

Microsoft Wireless IntelliMouse Explorer
+ Optical Mouse, USB interface, two extra buttons
- Expensive
Contact: Microsoft Corporation
Phone: 011-26294600
E-mail: connect@microsoft.com
Price: Rs 4,278



Sound Card
Creative SoundBlaster Audigy 2 Platinum
+ 6.1-channel output
- Expensive
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshekhar_bhatt@ctl.creative.com
Price: Rs 15,199

Laptop
IBM T40
+ Great design, excellent performance
- Expensive
Contact: IBM India Ltd
Phone: 080 2063199
E-mail: sanmenon@in.ibm.com
Price: Rs 1,69,990

Branded PC
Zenith Premium PC
+ 3.2 GHz, 17-inch LCD
- No Operating System
Contact: Zenith Computers Ltd
Phone: 022-2837 7300
E-mail: one-up@zenith-india.com
Price: Rs 60,000

Multi-functional Device
Xerox WorkCentre Pro 412
+ Fast printing, excellent quality
- Expensive
Contact: Xerox Modicorp Ltd
Phone: 0124-2561930/ 940
E-mail: kuldeep.malhotra@ind.xerox.com
Price: Rs 72,500

Laser Printer
Samsung ML-1710
+ Extremely fast
- Does not support USB 2.0
Contact: Samsung Electronics India Information and Telecommunication Ltd
Phone: 011-51511234
E-mail: farrukh@samsungindia.com
Price: Rs 13,990

Inkjet Printer
Canon S530D
+ Supports direct printing from digital cameras
- Expensive
Contact: Canon India Ltd
Phone: 011-26806572
E-mail: rajeev.singh@canon.co.in
Price: Rs 24,995

Scanner
HP Scanjet 4570C
+ Excellent scan quality
- Heavy and bulky
Contact: HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 17,999

PDA
Sony CLIE PEG-TG50
+ Runs Palm OSS and has a 320 x 320 TFT LCD display
- Rapid battery consumption
Contact: Solar Systems
Phone: 022-56916834
E-mail: solarsystems@vsnl.net
Price: Rs 27,000

Mobile Phone
Sony Ericsson P800
+ Easy and intutive navigation
- Blocky design makes it bulky
Contact: Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@sonyericsson.com
Price: Rs 34,995

Digital Camera
Canon IXUS 400
+ Cerabrite body, better buttons layout, wide shutter speed range
- Ultra compact body hampers handling
Contact: Canon India Pvt Ltd
Phone: 011-26806572
E-mail: shyam@canon.co.in
Price: Rs 49,995

MP3 Player
Apple iPod
+ Hard-drive based, FireWire cable bundled, line-out socket
- Very expensive
Contact: Apple Computer International Private Limited
Phone: 080-25550575/ 73
E-mail: indiainfo@asia.apple.com
Price: 30 GB-Rs 45,000

Products that are the best value buy

CPU

AMD 2400+

+ Sufficient power for normal desktop use
- Cumbersome installation

Contact: Tech Pacific
Phone: 022-55960101
E-mail: pratik.chube@techpacindia.com
Price: Rs 4,900

Motherboard

Mercury KT400FDSX

+ Good configuration
- No onboard sound

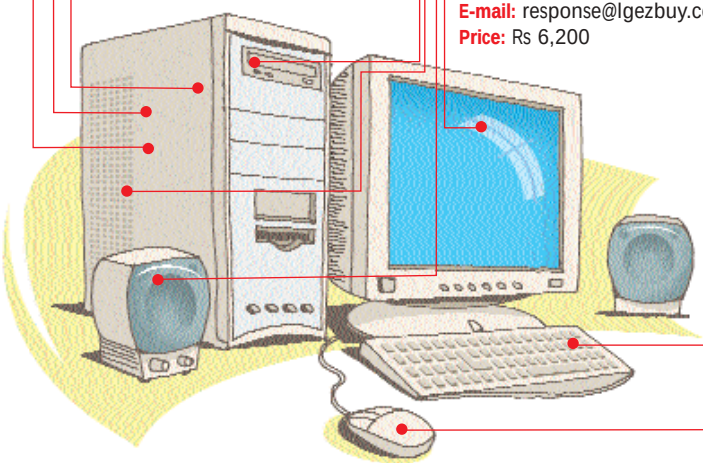
Contact: Kobian India Ltd
Phone: 080-25566624
E-mail: india@kobian.com
Price: Rs 2,800

Primary Storage

Samsung SV1203N 120 GB

+ Noise Guard and ImpacGuard
- 5400-rpm drive

Contact: Samsung Electronics India Information Telecommunication India Pvt. Ltd
Phone: 011-515111234
E-mail: marketing@samsungindia.com
Price: Rs 7,200



Secondary Storage

CD-Writer

Benq CRW5224W

+ Cheap
- Data cable not bundled

Contact: BenQ India Pvt Ltd
Phone: 022-25705231
E-mail: salesenquiryin@benq.com
Price: Rs 2,300

Graphics Card

Compro Paladyne FX 5600 128 MB

+ DirectX 9.0 compatible
- Very expensive

Contact: Mediatech India
Phone: 022-56396696
E-mail: sales@mediatechindia.com
Price: Rs 11,275

Speakers

Frontech JIL-1870

+ Good sound at an affordable price
- Cannot handle high volumes

Contact: Jupiter International
Phone: 022-22001211
E-mail: frontech@bom5.vsnl.net.in
Price: Rs 1,750

Display

CRT Monitor

LG StudioWorks 700S

+ High resolutions, great performance, anti-static, anti-glare, anti-reflection surface treatment
- No extra accessories

Contact: LG Electronics India Pvt Ltd
Phone: 0120-2560900
E-mail: response@lgezbuy.com
Price: Rs 6,200

Input Devices

Samsung PC Keyboard

+ Unmatched value for money
- No multimedia buttons, wrist support not bundled

Contact: Samsung Asia Pvt Ltd
Phone: 022-22814886
E-mail: marketing@samsungindia.com
Price: Rs 300

Logitech Scroll Mouse

+ Ambidexterous design

Contact: Rashi Peripherals
Phone: 022-28260258/ 59
E-mail: ho@rptechindia.com
Price: Rs 475

Branded PC

HCL EzeeBee

+ Winner of Best Value and Best Performance
- Needs a better graphic card

Contact: HCL Infosystems Ltd
Phone: 0120-2520977
E-mail: raman@hclinsys.com
Price: Rs 27,490

Laptop

ACI Ethos 4

+ Good configuration for the price
- Hampered ergonomics

Contact: Allied Computer International (Asia) Pvt Ltd
Phone: 022-56943260/ 26733124/ 56407000
E-mail: sales@aci-asia.com
Price: Rs 54,000

Multi-function Devices

HP PSC 2110

+ Good print quality
- No fax capabilities

Contact: HP India Ltd
Phone: 011-26826000
E-mail: seema.dawar@hp.com
Price: Rs 9,999

Laser Printer

Samsung ML-1510

+ Good image quality
- Slow print speed for combo document

Contact: Samsung Electronics India Information and Telecommunication Ltd
Phone: 011-51511234
E-mail: farrukh@samsungindia.com
Price: Rs 11,000

Inkjet Printer

HP 3325 Deskjet

+ Very small form factor
- 765 KB of buffer memory

Contact: HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 2,999

Scanner

HP 2300 Scanjet

+ Low warm-up time

Contact: HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 3,499

PDA

Palm Zire 71

+ Affordable, good battery life, comprehensive PIM applications
- No Palm Universal Connector, no backlight, no expansion slots

Contact: Tech Pacific Technology (India) Limited
Phone: 022-55960101
E-mail: aparna@corvoshandwick.co.in
Price: Rs 7,250

Digital Camera

Kodak DX6340

+ 3.1 megapixel camera with 4X optical zoom
- Only 16 MB memory

Contact: Neoteric Infomatique
Phone: 022-24172600
E-mail: rajeev@neoteric-info.com
Price: Rs 23,000

Mobile Phone

Sony Ericsson T200

+ Light-weight, perfect grip, WAP 1.2.1 browser and 43.2 Kpbs GPRS, PIM features
- Keys are hard and noisy, unusual socket for the charger

Contact: Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@sonyericsson.com
Price: Rs 5,995

MP3 Player

Ennyah Digisound II DS601

+ Fast data transfer, feature-rich

Contact: Great World Tech Pvt Ltd
Phone: 022-23892828
E-mail: sales@gtechworld.com
Price: Rs 6,250 (approx)

Bazaar

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

Handspring Treo 180

Digital phone assistant

The blue-grey Treo 180 from Handspring rolls the functionality of a PDA and a cell phone into a single device.

It features a 160 x 160 greyscale screen with a lid. The glass window on the lid lets you see who's calling. There's no graffiti input

mode, but the QWERTY mini-keyboard is quite handy when typing long SMSes.

The device can't read SMS messages off the SIM card, but offers to move them to its own memory when you install the SIM. The SIM Book module can read phone numbers stored on the SIM. Voice clarity is quite good, and there's an inbuilt speakerphone option. The phone supports GPRS, and you can surf the Web using the installed Blazer Web browser.

As a PDA, the Treo 180 offers standard Palm applications such as the Calculator, Date Book, Memo Pad, World Clock and To Do. The Phonebook works as the contacts manager, and integrates nicely with the phone for direct dialling.

The device connects to a PC through the bundled USB cable; there's no cradle. Syncing is extremely simple: Just install the provided software, and press a button to begin syncing data.

The inbuilt lithium-ion battery lasts for just about a couple of days with standard phone and PDA usage, though this period can stretch to about three weeks if you switch off the wireless mode and use the Treo as a plain PDA.

The Treo 180 can work nicely for you as an integrated solution. The lack of a colour screen and a camera at this price point could be a deterrent, though, and there are newer models in the market that you can consider.

SPECIFICATIONS

33 MHz Motorola Dragonball VZ processor, 16 MB RAM (non-expandable), PalmOS 3.5, 4.2 x 2.8 x 0.8 inches, weight: 147 gms, dual-band GSM 900/1900 MHz, backlit monochrome display, Infra-red, GPRS, Windows and Mac compatible

Price: Rs 14,500
Contact: Pitroshni Corporation
Phone: 022-22000013
Fax: 022-22070143
E-mail: pitronsys@yahoo.com
Web site: www.handspring.com

Handspring Treo 180	B
Performance	
Features	
Usability	
Value for money	

Nokia 6600

Chubby cheeks, dimpled chin

The 6600 from Nokia is a successor to the 7650 and 3650 models, and is much better designed. It's smaller, lighter, oval shaped and uses a Series 60 platform. It has a dual-tone finish. The five-directional joystick is flanked by two customisable soft-keys. The camera sits in the centre of a circular panel at the rear.

It has a 176 x 208 pixel active matrix TFT display which supports 65,536 colours; MIDI is supported. The internal memory is 6 MB, but a 32 MB MMC card is included for additional memory. The integrated camera captures video clips at 176 x 144 or 128 x 96 pixels. Standard messaging features are supported. You can connect to other devices using Bluetooth or Infra-red. GPRS and High Speed Circuit Switched Data (HSCSD) data transfer speeds reach 40.2 Kbps and 43.2 Kbps respectively. It has voice dialling, voice commands, a voice recorder and a hands-free speaker.

Voice clarity is excellent, you'll have no problems, even in a noisy environment.

The startup time is quite long, and even the backlight takes time to come on. However, when it does, you see a clear and bright screen. Screen visibility reduces in direct sunlight, but is usable. Still pictures captured using the camera come out fine in good lighting conditions. There's no flash.

The video-capture quality is plain acceptable; The audio captured with the video is better. A sore point is the length of captured clips—just about nine seconds. The included BL-5C battery offers a couple of days' life with normal usage.

The 6600 is definitely a phone to consider buying, especially if you can afford the price. However, there are not many compelling reasons for existing Nokia 7650 or 3650 users to switch to it.

SPECIFICATIONS

Tri-band (GSM E900/1800/1900), Symbian OS 7.0, dimensions: 108.6 x 58.2 x 23.7 mm, weight: 125 gms, integrated 640 x 480 camera with 2X digital zoom, video recorder, 32-note polyphony, GPRS, WAP, HSCSD

Price: Rs 23,799
Contact: Nokia India
Phone: 011–26779000
Fax: 011–26779147
E-mail: nokia.ebag@nokia.com
Web site: www.nokia.co.in

Nokia 6600	B+
Performance	
Features	
Ergonomics	
Value for money	

Intel Prescott 3.2 GHz processor

A little too new

Intel has finally announced the launch of its new Prescott line of processors. The Prescotts are the first desktop processors to be based on the 90 nm manufacturing process.

The new processor core competes directly with AMD's Athlon 64 line, but will also help phase out the Northwood-based Pentium 4 processors by the end of 2004. The new processors will be available from 2.8 GHz to 3.4 GHz, for now—Intel estimates that they will cross the 4 GHz mark by the end of 2004. For processor speeds above 3.4 GHz, a new chipset and socket is under way. Current Prescott processors have the same pin count as Northwood, and are compatible with the Socket 423 motherboard. Most motherboards supporting 800 FSB processors will be able to take the 3.4 GHz Prescott, though a BIOS upgrade from the board manufacturer might be required in certain cases.

The new manufacturing process will help Intel better the yield per silicon wafer, thus lowering the price per processor. However, it will be some time before Intel can pass on the benefits to consumers.

The new Prescott processors have a host of new developments at the manufacturing level, such as the use of 'strained silicon'—atomic level changes in the silicon lattice—and smaller gate transistor lengths. All of this helps make the transistor work faster, and allows for more transistors to be cramped on to a chip.

Other improvements, such as the inclusion of seven layers of copper interconnect, as opposed to 6 on a normal Northwood Pentium 4, help in designing a complex logical block, but without increasing the core area. One particular disadvantage of the 90 nm technique is current leakage, which results in higher voltage requirement and thus, higher heat dissipation.

Unlike the Pentium4 EE, where Intel just added an additional L3 cache to the existing Northwood core, the Prescott is an entire new processor, with heavy revisions done to the NetBurst micro-architecture—the term introduced for Pentium 4 design architecture. The idea behind this architecture was to increase CPU performance by increasing the clock frequency; but increasing the frequency calls for lengthening of the execution pipeline—a line-up of 'to do things'. This again means improving the branch predicting unit, so that it results in proper predictions, saving time lost due to wrong predictions. Thus, an improved branch predicting unit is under the hoods of the Prescott.

The most noticeable change is the increase in cache memories. The L1 cache has gone from 8 KB to 16 KB, and the L2 has also doubled to 1 MB. The introduction of 13 new SIMD instructions also improves graphic rendering applications.

Our test system comprised an Intel 875PBZ motherboard, ATI Radeon 9600 Pro Graphic Card, 512 MB DDR400 RAM and a 120 GB Seagate SATA hard drive. Windows XP with SP1 and all necessary drivers were loaded.

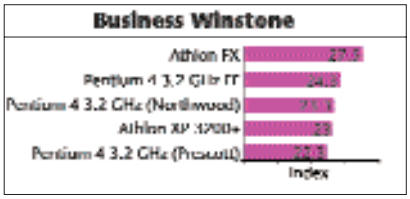
In the Content Creation 2004 test, the Prescott could only out perform the Athlon XP 3200+. Even the older Northwood-based Pentium 4 3.2 GHz beat it—this is due to the longer pipeline in the Prescott, which increases the latency. This is only temporary, and will vanish as processor frequencies increase. The Business Winstone test saw similar results.

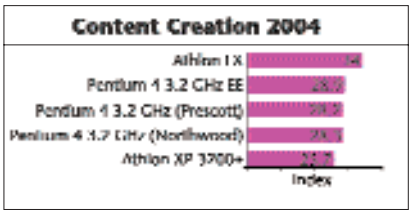
In *UT2003*, the Prescott lost to the 3.2EE by 3 fps—scoring 80.39 at a resolution of 640 x 480. In the other gaming tests that we put it through, it was always a hair's breadth behind the 3.2EE.

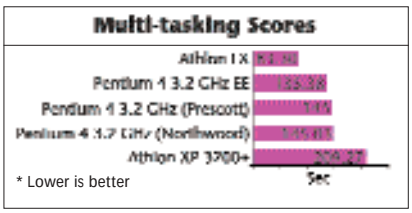
In the PovRay 3.5 OpenGL test—a rendering benchmark—the Prescott lost badly to the 3.2EE and the Athlon XP 3200+. Though the Athlon FX was the slowest, we suspect this is due to PovRay's problem with the 64-bit Athlon FX processor.

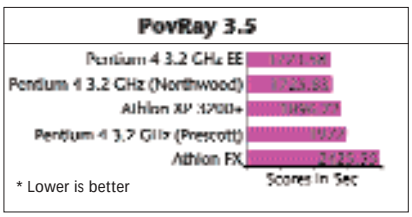
In the Super Pi test, the Prescott returned better scores than the 3.2EE and Athlon XP 3200+. This can be attributed to the improved execution unit within the processor.

The Prescott 3.2 GHz is temptingly priced at Rs 14,000, but for now, is too immature a line to recommend. It's a good performer, but doesn't really offer any significant advantages, yet. We suggest you wait for the Prescott's migration to the different socket and chipset, where the advantages will be more visible.









Price: Rs 14,000
Contact: SES TECH Ltd
Phone: 022-26824141
Fax: 022-26824581
E-mail: kp@sesindia.com
Web site: www.intel.com

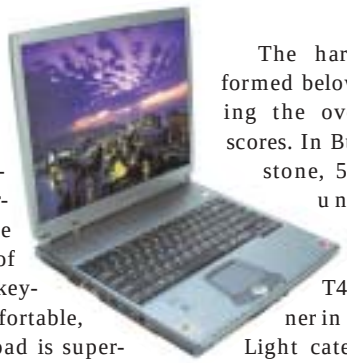
SYSTEM REQUIREMENTS

Socket 478, 1 MB L2 Cache, 90 nm fabrication Process, 800 MHz FSB, HT enabled

Intel Prescott 3.2 GHz processor	A-
Performance	
Features	
Build quality	
Value for money	

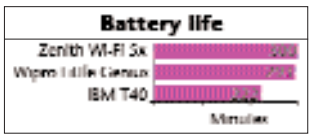
Zenith Premium Wi-Fi 5x Notebook

Copy cat



The Centrino-based Wi-Fi 5x makes a mark in the looks department with a silver-grey body and the subtle use of chrome. The keyboard is comfortable, while the touchpad is super-sensitive. The optical drive and the battery can be easily swapped. Build-wise, the laptop is rugged.

It has a Pentium M 1.4 GHz, 128 MB DDR RAM, 30 GB hard disk and a combo-drive. We tested using 256 MB of RAM—and we recommend the upgrade. The Audio DJ lets you listen to CDs without switching on the laptop.



The hard disk performed below par, affecting the overall system scores. In Business Winstone, 5X scored 24 units—three units short of the IBM T40, our winner in the Thin and Light category in the January tests. The graphics sub-system was a disappointment: The 5x was able to extract only 42 fps in *Quake III Arena* at 1,024 x 768. The batteries lasted about five hours, posting the best scores to date by any laptop. At Rs 84,000, the Wi-Fi 5X is a decent buy.

SPECIFICATIONS

Pentium M 1.4 GHz, 128 MB DDR RAM, Wireless LAN (802.11b), 30 GB hard drive, 15-inch TFT, IR port, card reader, TV-out

Zenith Premium Wi-Fi 5X Notebook	B+
Performance	
Features	
Ease of use	
Value for money	

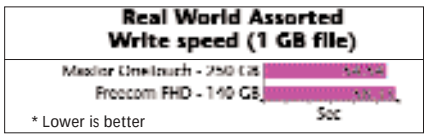
Price: Rs 84,000 (Rs 2,000 extra for an additional 128 MB of RAM)
Contact: Zenith Computers ltd
Phone: 022-28377300
Fax: 022-28364859
E-mail: laptops@zenith-india.com
Web site: www.zenith-india.com

Maxtor OneTouch 250 GB External Hard Drive

Touch and store

The elegant-looking OneTouch external hard drive is the answer for any storage needs you may have. It has a performance-enhancing 8 MB buffer. The drive sports a metallic silver and blue body, with a customisable onboard button.

The drive turned up good scores as compared to other external drives, in terms of performance and features. It has both, USB 2.0 and Firewire ports. In SiSoft Sandra 2003 Pro, it scored an impressive 21,428 KBps. It also logged a low 6 ms access time, and got to a sequential read speed of 27 MBps—this matches that of internal 7,200-rpm IDE drives. In the file transfer test, this drive outclassed all the other external disks we've ever tested. It took just 54.54 seconds for the 1 GB write test, as compared to 58.33 seconds for our performance winner, the Freecom FHD-1 40 GB drive. The read speed was also the best amongst all external drives—it took just 47.12 seconds to read a 1 GB file from this drive, as compared to 53.66 seconds for the Freecom. In the CPU utilisation test, it logged 20.3 per cent, the highest we've seen.



The drive comes bundled with Dantz Retrospect, a backup and disaster-recovery software. At Rs 19,500 excluding taxes, it's the cheapest external drive in terms of price per MB.

SPECIFICATIONS

250 GB, 7200 rpm, 8 MB buffer, 1.38 Kg, USB 2.0 and Firewire interface, OneTouch hotkey to launch an application

Maxtor OneTouch 250 GB external hard drive	A
Perfrormance	
Features	
Build quality	
Value for money	

Price: Rs 19,500 + taxes
Contact: eSys
E-mail: yogi@maxtor.com
Web site: www.maxtor.com

Microsoft Basic Wireless Optical Desktop

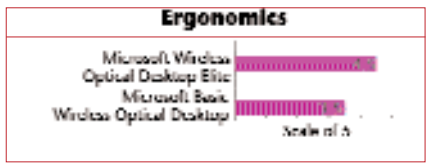
A good combination

This keyboard-mouse combination retains nearly all the features of its more expensive brethren, except for a palm-rest. It has a grey-and-white finish. The keyboard ergonomics are good and the mouse design is ambidextrous. Two AA batteries make the mouse slightly heavy.

The keyboard has multimedia and one-touch access keys for My Music, My Documents, etc. The function keys can be toggled using [F-lock] to double up as shortcut keys for Copy, Paste, etc. Other features include a logoff button and a recessed Sleep key.

The combo connects to a PC via a small radio receiver. The mouse has USB and PS/2 connectors, but the keyboard only has a PS/2 connector.

At Rs 4,590, it's an excellent, but expensive product.



SPECIFICATIONS

Customisable button, sleep and log-off hotkey, PC and Mac compatible, ambidextrous mouse

Microsoft Basic Wireless Optical Desktop	A-
Performance	
Features	
Build quality	
Value for money	

Price: Rs 4,590
Contact: Microsoft Corporation (India) Pvt Ltd
Phone: 011-26294600
Fax: 011-26292650
E-mail: connect@microsoft.com

SB62G2 Shuttle XPC

Bonsai powerhouse

Based on the Intel 865G chipset, the Shuttle SB62G2 XPC is a miniature powerhouse. It has a brushed aluminium finish, and stands no taller than half a mini-tower. The screwless cabinet houses an 865G chipset-based custom-made motherboard, which supports a Pentium 4 processor up to 3.2 GHz, and has two memory slots for 400 MHz DDR memory. Cooling for the processor is via a specially designed heat-pipe cooling technology. The bracket that holds devices such as the hard disk is detachable. The necessary cables are provided, and the detailed manual illustrates the cable layout procedures clearly. There's one AGP slot and one PCI slot. The back panel has an onboard LAN connector, four USB 2.0 ports, one Firewire port, one onboard VGA connector and a serial port. The front has additional USB and Firewire ports. The XPC comes with support for six-channel sound, and optical In/Out for SPDIF connections.

In the Content creation and Business Winstone test, the XPC nearly outperformed several recently tested motherboards. The video encoding test took 72 seconds—similar to other 865-based boards. Gaming performance, too, was comparable to that of most 865-based boards.

The XPC is priced at Rs 16,500—an expensive proposition, considering that it's basically just a motherboard in a space-saving cabinet.

Price: Rs 16,500
Contact: Mediatech India
Phone: 022-26361111
Fax: 022- 26312222
E-mail: info@mediatechindia.com
Web site: www.shuttle.com

SPECIFICATIONS

865G chipset motherboard, support for DDR 400 MHz, six USB 2.0 ports, two Firewire ports, SPDIF-In/Out, proprietary heat pipe cooling, 220 W power supply

SB62G2 Shuttle XPC	B
Performance	
Features	
Build quality	
Value for money	

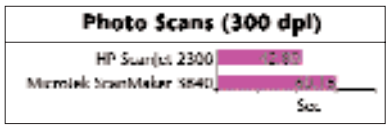
Microtek ScanMaker 3840

Cheaper, faster, better

The ScanMaker 3840 from Microtek scans at an optical resolution of 2,400 x 1,200 pixels at 65,535 colours, in software interpolated mode. The scanner has a USB interface with three hotkeys for scan, mail and print.

The provided TWAIN driver is not as intuitive as those that come with other scanners; also, values are predefined. However, there is an advanced mode, from where you can custom-define the resolution, and set brightness and contrast.

The build quality is solid, and performance was decent. Scanning our text document at 300 dpi took 24.78 seconds. It took a little over three minutes for the same document at 1,200 dpi. It read the scanned newspaper image using OCR software without a glitch.



The scanner also passed the image quality evaluation test with above-average results. It disappointed in the smoothness test, where the image was a little on the dark side; also, the colour blend in a shadowed area appeared blocky.

Price: Rs 4,999
Contact: Rashi Peripherals
Phone: 022-28221013
Fax: 022-56916609
E-mail: ho@rptechindia.com
Web site: www.microtek.com

The scanner is priced at Rs 4,990, and makes for a good buy wherever scanner use is occasional. We recommend it for document scanning, but not for images.

SYSTEM REQUIREMENTS

1,200 x 2,400 dpi, A4 scan area, USB interface, 48-bit colour depth

Microtek ScanMaker 3840	B-
Performance	
Features	
Ergonomics	
Value for money	

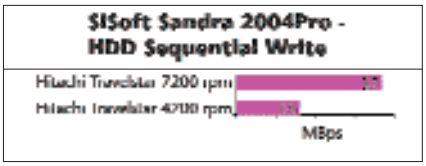
Hitachi Travelstar 7K60 (60GB 7200rpm laptop hard drive)

Faster, and how!

This 2.5-inch form factor drive gives a much needed boost to laptop performance. We tested the drive with a Zenith 5X Premium notebook, and the scores were compared with those of the 4,200-rpm drive within the laptop. The Travelstar scored much higher, as we expected.

In the SiSoft Sandra 2004 Pro drive benchmark, the Travelstar managed 25,592 drive-indexes, as compared to just 11,724 for the 4200-rpm drive. It also logged 37 MBps sequential read speed and 7 MBps sequential write speed, as compared to 16 MBps and 4 MBps respectively for the 4,200-rpm drive.

This drive is best suited to notebooks that use desktop processors, and also have better graphics chips on board. The Travelstar is also suitable for slim form-factor desktop PCs such as the Dell Optiplex series.



Price: Rs 20,500 plus taxes
Contact: Spectra Innovations Inc
Phone: 011-25737668
Fax: 011-25737668
Web site: www.hitachi.com

The price—Rs 20,500 plus taxes—makes the Travelstar an expensive upgrade, but if you use your laptop for disk-intensive computing needs, this is the drive we recommend. The Travelstar carries a three-year warranty.

SPECIFICATIONS

60 GB, 7,200 rpm, 2.5-inch form factor, ATA6 interface

Hitachi Travelstar 7K60 (60GB 7200rpm laptop hard drive)	B
Performance	
Features	
Build quality	
Value for money	

DigiVue DG-210 2.1 MP Camera

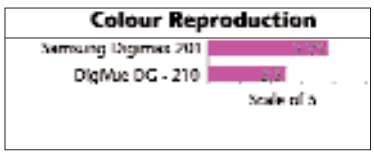
When price matters

The DG-210 features 2.1 megapixels, 3X optical and 2X digital zoom, and a 16 MB Compact Flash memory card.

The camera looks rather bulky. There are several inconveniences that are apparent: you need to press the shutter button for about two seconds, and wait for a sound before the image gets clicked. The flash takes over three seconds to charge. The lens moves in and out very slowly, making it difficult to capture a moving object and refocus on the fly. The images we clicked were dark, both indoors and outdoors. Colours such as orange were too bright, and green, too dark.

The camera is targeted at photo studios, and so comes with Photoshop 5 LE, which can be used to generate multiple passport size images. The DG-210 allows exposure settings from +2EV to -2EV in steps of 0.5EV. Regular users need to have knowledge of how to adjust this in different conditions for decent photographs.

At Rs 10,000, the camera is cheap, and will appeal to those migrating from film to digital cameras. However, we recommend spending a few thousands more for a better camera.



SPECIFICATIONS

2.1 megapixels, 3X optical zoom, 2X digital zoom, 16 MB CF card, four AA battery

DigiVue DG-210 2.1 MP Camera	B-
Performance	
Features	
Ease of Use	
Value for money	

Price: Rs 10,000
Contact: Monarch Video Vision
Phone: 022-22619022
Fax: 022-22618706
E-mail: viren@bom2.vsnl.net.in
Web site: www.monarchvision.com

Dragon NaturallySpeaking 7 Professional

Hands-free typing

This is the latest version of the popular software. There's a new Vocabulary Optimiser, which analyses the documents on your machine, to understand your writing habits. The provided handbook explains all valid voice commands, such as "start Internet Explorer", "click control menu", etc.

The software provides good functionalities, such as integration with Word, Internet Explorer, playback of dictations, voice control of Windows, customisable vocabularies, and more. There's support for additional input devices such as a digital recorder, Pocket PC, cordless microphone, etc.

The software provides a set of APIs so that developers can extend the existing functionality.

On the performance front, the software handles voice commands exceedingly well, but when it comes to dictation, it doesn't get every word right. This performance lag is only for a short while, though. However, there are times when the software doesn't understand a word, even after one repeats it as many as four or five times.

This professional version costs Rs 44,995—consider it only if your workload is very large.

Price: Rs 44,995
Contact: ScanSoft International
Phone: 011-26207477
Fax: 011-26207495
E-mail: sameer.dania@scansoft.com
Web site: www.scansoft.com

SPECIFICATIONS

Intel Pentium III 500 MHz or equivalent processor, 256 MB RAM, 300 MB hard disk space, Microsoft Windows 98, Me, XP, 2000, 95C or NT4, with SP-6 or greater, Creative Labs Sound Blaster 16 or equivalent sound card supporting 16-bit recording, Microsoft Internet Explorer 5 or higher, CD-ROM drive, ScanSoft-approved noise-cancelling headset microphone (included), speakers (for playback of recorded speech and for text-to-speech features)

Dragon Naturally Speaking 7 Professional	B+
Performance	
Features	
Ease of use	
Value for money	

AverMagic Pro Plus

Magician at work

AverMagic Pro Plus is an image-editing tool that lets you retouch old or damaged images, revive them, do digital mixing, create visiting cards and so on. Using the software, you can turn black and white images to colour; you can define the skin tone in photographs, and even smoothen wrinkles.

The digital mixing feature is most commonly used in wedding albums. The process requires patience, though. Text can be added for effect. There are several pre-defined templates that allow you to quickly create frames for the front of albums, select a canvas with a texture of choice, place objects such as flowers into your photographs, and so on.

The features this software offers are all there in Photoshop; however, AverMagic Pro has been specifically developed for tasks such as the ones above, and the learning curve is therefore reduced.

It is worth its price of Rs 3,750 as it is customised to do a niche job, and do it more efficiently.

Price: Rs 3,750
Contact: Aver Software Technologies Ltd
Phone: 022-26732955
Fax: 022-26732956
Web site: www.avermagic.com

SPECIFICATIONS

Windows XP or 2000, PII or above processor, 64 MB or more of RAM, 2X or a faster CD-ROM drive, 15 MB hard disk space, SVGA video card

AverMagic Pro Plus	B+
Performance	
Features	
Ease of use	
Value for money	

Aural Aura

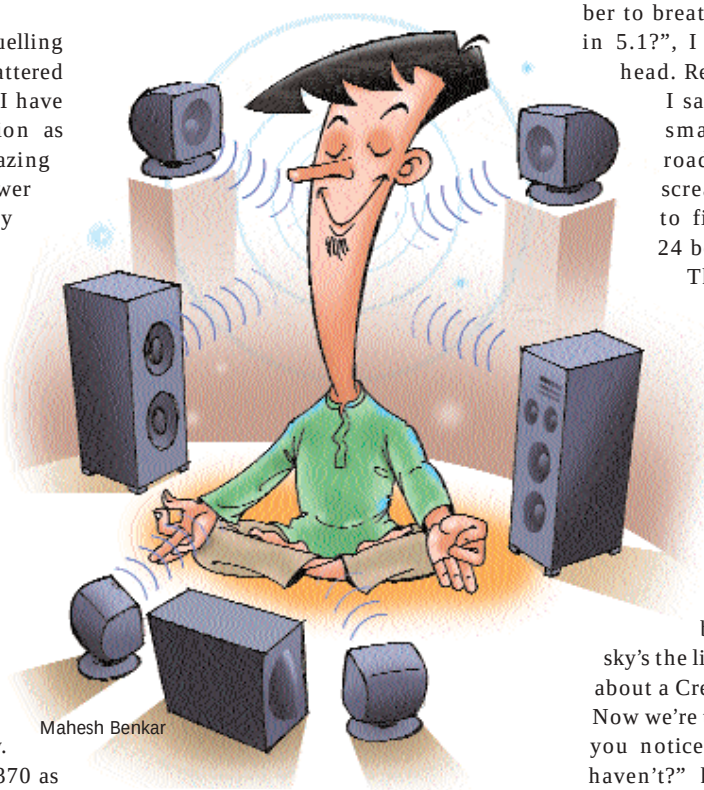
Agent 001 mulls over hitting the right note

Recently, I was at a friend's house for a *UT 2003* LAN party. Of course, this friend is one of those people who can deflate your ego in a nanosecond. He has six gaming rigs, and one personal PC. The gaming rigs are standard high performance machines, made-to-order, for one purpose only—gaming. His personal computer, on the other hand, has the latest and best hardware, a 19-inch flat monitor, 7.1 speakers with bass that can knock the breath out of you, etc.

On my way home, after eight gruelling hours of splattering and being splattered by rocket launchers, I realised that I have almost as good a PC configuration as him—the difference between amazing and average was just the sound power and quality. While I was busy scrounging, scrimping and saving money to buy faster RAM, faster and larger hard drives, faster CPU, the best motherboard, a 9800 Pro graphics card and a huge monitor, my friend outsmarted me with amazing audio. My mind was made up—I would take a trip to Mumbai's Lamington Road the next day to get that perfect sound.

I walked into the first shop that displayed speakers, and told them that I wanted the best sound solution that my money could buy. He suggested a Creative SoundBlaster 4.1 Digital sound card with Creative Inspire 4.1 speakers. The cost: Rs 1,200 and Rs 3,000 respectively. He suggested the Creative SBS 2.1 370 as well, for Rs 1,550. I promptly demanded more, and the best he came up with was the Creative SoundBlaster Live 5.1 SE sound card and Creative Inspire 5.1 speakers—Rs 2,070 and Rs 4,700, respectively. He told me that I could opt for Altec Lansing speakers, but they were more expensive and didn't offer any performance gains over the Creative sets. According to him, Frontech and Mercury were just cheap, but did nothing for the ears of even the most amateur of audiophiles.

From here on, almost every shop I went into said exactly the same thing. Some even suggested the Frontechs. Oblivious to things such as frequency response and RMS power, they insisted it was a good buy just because it offered an FM tuner. "You can listen to radio even when the PC is off, what more can you want?", asked one. Frustrated, muttering under my breath about morons selling onions and potatoes instead of superbly crafted hardware, I plodded on.



Mahesh Benkar

The next guy suggested a JBL PRO 2.1 speakers. "Nice," I thought. "Only Rs 9,500", he added. "Umm, not so nice after all. Breathe, breathe, must remember to breathe", I told myself. "Nothing in 5.1?", I asked aloud. He shook his head. Relieved, I darted for the exit.

I saw a guy walking out of the smallest looking shop on the road, carrying a large carton that screamed Artis 5.1. I walked in to find a young man of about 24 behind the counter.

The shop had everything you could dream of, all precariously stacked and balanced right up to the ceiling. The guy also seemed to know his stuff. The store was crowded with about two people, so I waited my turn politely. When he nodded at me, I asked for the best sound solution available. "Depends, on your budget", he shot back. "The sky's the limit", I replied. "OK then, how about a Creative 7.1 solution?" he asked. Now we're talking! I asked to see it. "Have you noticed some space in here that I haven't?" he asked, and with a smile started dialling four and eight digit numbers randomly.

He finally gave up and told me that there were none available off hand, and there would be a minimum waiting period of 15 days. He wouldn't give me the price, saying, "Fifteen days is a lifetime in this business, the price could double, halve or remain the same. Give me your phone number, and I will call you as soon as they're available." I left the number and went home. Now, I'm way too excited in expectation of the 7.1s, and terrified of the price he's going to quote. "The sky's the limit indeed!", me and my motor-mouth!

SHOPPING TIP

- Ensure that you have the requisite connectors on your sound card or onboard audio, before you buy a speaker set, especially if you are buying a 4.1 or a higher system. Basic speakers need only one connector, while the 4.1 and 5.1 systems have three connectors.
- Make sure that you get the original cords and connectors, as they also affect the quality of the sound dramatically.
- If you are buying stands for the speakers, ensure that the satellite speakers sit on them rigidly.
- Insist on a demo before buying, and if possible, at the place where you are going to install it.
- Buy noise-cancellation headphones—similar to those used in airlines—if you plan to use headphones in a noisy area.

PHOTOGRAPHER: Mexy Xavier IMAGING: Solomon Lewis

You got Game

The Internet is the ideal arena for gaming challenges. But which games and where do you find them? Read on...

Gaming is no longer a geek thing! From bored secretaries playing *Solitare* and *Bejewled* to self-proclaimed gamers drooling over the scenery in *Serious Sam II*, everyone has a favourite game. We all love to boast about the scores we've achieved in the games we're obsessed with—this week's games at least.

Blame it on the competitive world we live in, and the rat race we're all trying to win—the fact is the thrill of a 'High Score' is like a drug. This substance abuse is no longer limited to teenagers, or the teens-at-heart—my mother, who can just about check e-mail, has developed a dependence on *Dynomite*, a game from Pop Cap Games.

Of course computer manufacturers are making the most of all this, and coming out with 'Gaming rigs' for those who need really high frames per second (fps) rates, aniscopic filtering, etc., while playing *Halo*, *Quake III*, *Serious Sam*, etc. Even gaming consoles such as Microsoft's Xbox and Sony's PS2 are gaining popularity, in turn making multi-player gaming more popular. How many of you out there with kids in the family have been bugged to chaperone an outing to McDonalds, more for the PS2 than the burgers? The rising Internet penetration also helps, as there's tons of competitiveness when playing multiplayer games. The thrill of playing a game against someone as far off as Iceland or Argentina is also addictive.

There are basically two different types of games—browser-based games and stand-alone games that connect to game servers. Browser-based games need no additional software to be installed on your machine, and are usually quite simple and straightforward. These include games from Yahoo! Games ***(http://games.yahoo.com)*** and MSN Gaming Zone ***(www.zone.com)***; both feature single as well as multiplayer games. Stand-alone games such as the *Quake* series, *Halo*, *Half-Life*, *Counter-Strike*, etc., need you to run the game and then connect to Internet game servers to participate in a game.

Nothing but

Browser-based games are popular for two reasons. First, you don't need a high-end machine to play them, as they run within a browser window. Second, you don't need to install any major software. Most games use the Java Run Time Environment, Macromedia Flash or Macromedia Shockwave players, you can install these from ***www.java.com*** and ***http:// www.macrome-***

dia.com/downloads/.

Perhaps the first name that one thinks of when going online to play a game is Yahoo! Games. It provides many Java-based single and multiplayer games. If you are playing a multiplayer game, you can choose a room to play in. After you have joined a room, you can join an existing game, create your own game, or just watch a game. The best part of Yahoo! is that it comes up with new games frequently—addictive games that are easy to learn. The bad part is that not all games are free. Keep an eye out for the words 'All-Star', these require you to pay Yahoo! a small fee to play. It's also hard to figure out which games are single player and which are multiplayer.

Another thing to keep an eye out for is the attitudes of players. Yahoo! has a ranking system: when you first join, you are given the rank of 'Provisional player'. Based on your performance in successive attempts, this ranking improves. The problem is that higher ranked players tend to treat a Provisional player as an amateur; they might even refuse to play. If this happens, simply ignore them and find other players and games to join.

MSN Gaming Zone ***(www.zone.com)*** from Microsoft offers 71 free single and multiplayer games. The games are designed well, and you may need to load some software before you can play. When you get the software install security warning, insure that it's from Microsoft, click Yes, and you're ready to play. Though there are paid games available, the free games section is clearly demarcated on the home page. However, you will have to endure many advertisements, and ensure that you click on the correct link to start playing. Also, remember that there might be problems if you use a browser other than Internet Explorer 5 and above.

Playsite ***(www.playsite.com)*** offers many interesting and addictive Java-based single and multiplayer games. The emphasis of this site is on winning virtual cash by playing games. When you register as a 'Free player', you're given 500 'Playing bucks'.

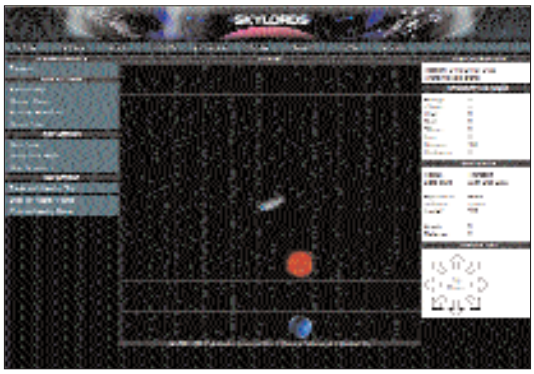
Depending on whether you lose or win, playing bucks are added or subtracted from your account. This adds the feel of playing with real money, and can get quite addictive. You can keep asking for more until your request total up to 500 playing bucks. All the games are conveniently arranged in categories—Card Games, Billiards, Puzzles, Word Games, Board Games, etc.

Miniclip ***(www.miniclip.com)*** features around 150 free Macromedia Flash and Shockwave games, and more games are added frequently. You will find many unique games here such as Snowboarder, Golf, Trial Bike, Table Tennis and Couronne. The only drawback is that since they're all based on Flash or Shockwave, the games might take a little long to load, especially if you're on a dial-up connection. Some games are totally free, while others are demo versions of paid games. If you are playing a demo version, you can only play each game for 15 minutes a day.

SkyLords found at ***www.skylords.com,*** is a massive multiplayer strategy game, which is played using only your browser, totally free! It includes many interesting features such as diplomacy, trading, piracy, espionage, space battles, custom spaceship model designing and clan warfare. This server can support thousands of players at a time, and each round lasts a month—starting on the first of every month, but you can join in anytime. When you signup, you have to undergo a training session to learn how the game works. This game is recommended for those who love strategy games. Another game similar to SkyLords is Fate Lords ***(www.fatelords.com)***, and they're many more online. To learn more about these MMOGs (Massive Multiplayer Online Games), go to MassMOG ***(www.massmog.com)***, a site dedicated to gaming and development news, articles and a discussion forum.

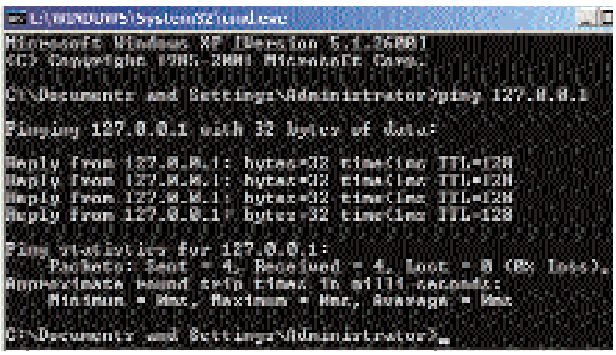
Everything but

Though browser-based games don't require fast connections and servers, software-based games such as the *Quake* series do. Even if you have a fast connection, but use a slow server, or use one that's just too far away from you, be prepared for jerky frame rates and a thoroughly uninspiring gaming experience. When playing software-based games online, remember the golden rule of Ping. The ping command is your friend, and will help you have a better gaming experience. The ping application is used to verify the existence of an IP address.



Thousands of people play the browser-based multi-player strategy game SkyLords

Before joining a server, make sure to ping it to see whether it's worth joining. Go to ***Start > Run***, type ***'command'*** and press ***[Enter]***. Ping the game server by typing ***'ping <IP>'*** or ***'ping <URL>'*** depending on whether the server you have is in IP or URL format.



You can ping yourself by typing 'ping 127.0.0.1' or 'ping local host'

The average value is what you should look at, the lower it is, the closer or faster the server is. An average of 300 ms or more is bad, and you definitely don't want to be on such a server. Also remember that data loss should be as close to 0 per cent as possible. For India, games servers located in the US are just too far away; instead look for servers in Singapore, or within India itself.

There are three different ways to find the server that is nearest to you. The first is to use the in-game browsers. Many games, such as *Halo, Call of Duty, IGI2*, etc., have in-built browsers to find the servers. Normally, to access these, you have to go to your game's ***Multiplayer > Internet*** menu option. Here you're presented with a list of available game servers, the number of users, ping times and other information. Arrange the list in ascending order by clicking on the 'ping' tab, and join the server with the lowest ping time.

Another method is to use third-party game-server browsers. These browsers are like the in-game browsers, except that they support many games. One of the most popular browsers is Game Spy Arcade—download it from ***www.gamespyarcade.com***. Not only can you find servers for most games, you can also use the inbuilt Web browser for some browser based fun.

Qtracker ***(www.qtracker.com)*** is a server browser with additional functionalities such as LAN game server browser, server launcher, MP3 streaming audio browser, HTM server list generator, etc. It keeps track of where a particular player is playing, and shows you an image of the map the player is playing on. You can change skins, and also search within Asia for a game server—thus providing you with faster servers.

Use your in-game browser to find the game server with lowest ping

Another game server browser called aGSM ***(www.agsm.net)***, allows you to find

What's Out There

	Web site	URL	Pros	Cons
Browser-based games	Yahoo! Games	***http://games.yahoo.com***	Addictive and easy to learn games.	Many games are not free
	MSN Gaming Zone	***www.zone.com***	Clearly demarcated section for Free games	You may need to install some software to play certain games. Most games are large, and take time to load
	Miniclip	***www.miniclip.com***	A lot of unique games	Demo versions can only be played for 15 minutes a day
	SkyLords	***www.skylords.com***	Interesting MMOG game with many interesting features such as diplomacy, trading, piracy, espionage, space battles, custom spaceship model designing and clan warfare	Not everyone likes MMOGs
Game browsers	Game Spy Arcade	***www.gamespyarcade.com***	Has a huge number of supported games. You can also play browser-based games	None
	Qtracker	***www.qtracker.com***	Can search for LAN games. In-built MP3 streaming audio browser can generate HTML server list	Doesn't support as many games as Game Spy Arcade
Indian servers	Frag-shak	***www.frag-shack.com***	Servers in Mumbai	Paid service; doesn't support many games
	Kawabonka	***www.kawabonka.com***	Free servers in Delhi	Doesn't support many games

What's for Me?

You have two choices for multiplayer online gaming—browser-based games and stand-alone games. Browser-based games are those played within your browser, e.g., the games you play at Yahoo! Games. Make do with these if you have a low-end system, or aren't interested in big games. What's more, you can minimise them in a fraction of a second, and bring up your work document if the boss passes your desk! On the other hand, if stunning graphics and great sound is what you're looking for, and you have a high-end machine to boot, then play stand-alone games such as *Halo*. Do keep in mind that browser-based games are the only option if you have a slow Internet connection.

and monitor multiplayer game servers for many popular online games. Those who run Linux can use XQF (***www.linuxgames .com/xqf/***), a game server browser and launcher that supports many popular games such as the *Quake* series, *Unreal Tournament*, *Half-Life*, etc.

You can also use your Web browser and go to specific sites to find the nearest servers. Web sites such as Moritt ***(http://www. morritt.tv/UT2003)***, which are dedicated to a specific games—*Unreal Tournament 2003* in this case—maintain a huge list of game servers. You can get the IP address and port from the site and use the game's multiplayer option to connect to it. You can also visit GameServers ***(http://gameservers.net/overview_clans.php)*** to find a list of such servers. However, none of these sites provide a region-wise list of servers.

Desi game servers

Multiplayer online gaming is still in its nascent stage. There aren't many game servers in India, but hopefully this will change soon. Frag-Shak ***(www.fragshak.com)*** is one server that is located in Mumbai. Players from Mumbai can get ping times as low as 10 ms here. However, this service is not free—you need to pay a small fee of Rs 70 a month. It supports games such as *Quake III*, *Counter-Strike*, etc. You can download a client that tells you the currently available servers and their ping times.

For those living in North India, there is a site called Kawabonka ***(www.kawabonka .com)*** that has servers located in New Delhi. Dedicated servers are available for many First Person Shooter games such as *Unreal Tournament*, *Quake III Arena*, *Counter-Strike*, etc. Non-dedicated servers for many other games are also available. The best news: these servers are free!

Play it slow

Not all games need high FPS rates, or even have real-time capabilities. Chess, for example, is a game that many people love to take their time with, and some can take upwards of an hour to calculate a move. For such games, a slower paced interaction is quite sufficient. This is where Play By E-mail (PBeM, or just PBM) comes in. You can play chess by e-mailing your move to your opponent, and he e-mails his counter move back to you. Many other games can also be played this way. Sites such as PBeM ***(www.pbem.com)*** and PBM ***(http://www.pbm.com/~lindahl/ pbm_list/)*** are dedicated to them.

When a new strategy game is started, the situation, surroundings and options are announced by the game master. To join a game, you have to send an e-mail to the game master, and describe the character you want to play. After your request is approved, you can e-mail what you want your character to do in the given situation. After all the players have made their moves, the game master e-mails each player the current situation and all the players then make their next move. These sort of games are perfect for those who can't afford to spend more than a few minutes at a time playing a game.

Summing up

The best thing about the Internet is that it has something for everyone: if you're an avid gamer, you can play almost all of your favourite games with players around the world; if you only play occasionally, there are tonnes of browser-based games for you out there; you can also play games with your friends using the IMVironments of Yahoo! Messenger and MSN Messenger 6; and if you only have e-mail access, you can still play PBeM games. So go on out there, get rid of that boredom and play *TicTacToe* with your friends on MSN Messenger, or frag some dude in *Quake III*. There's just one rule... Have fun! Happy gaming!

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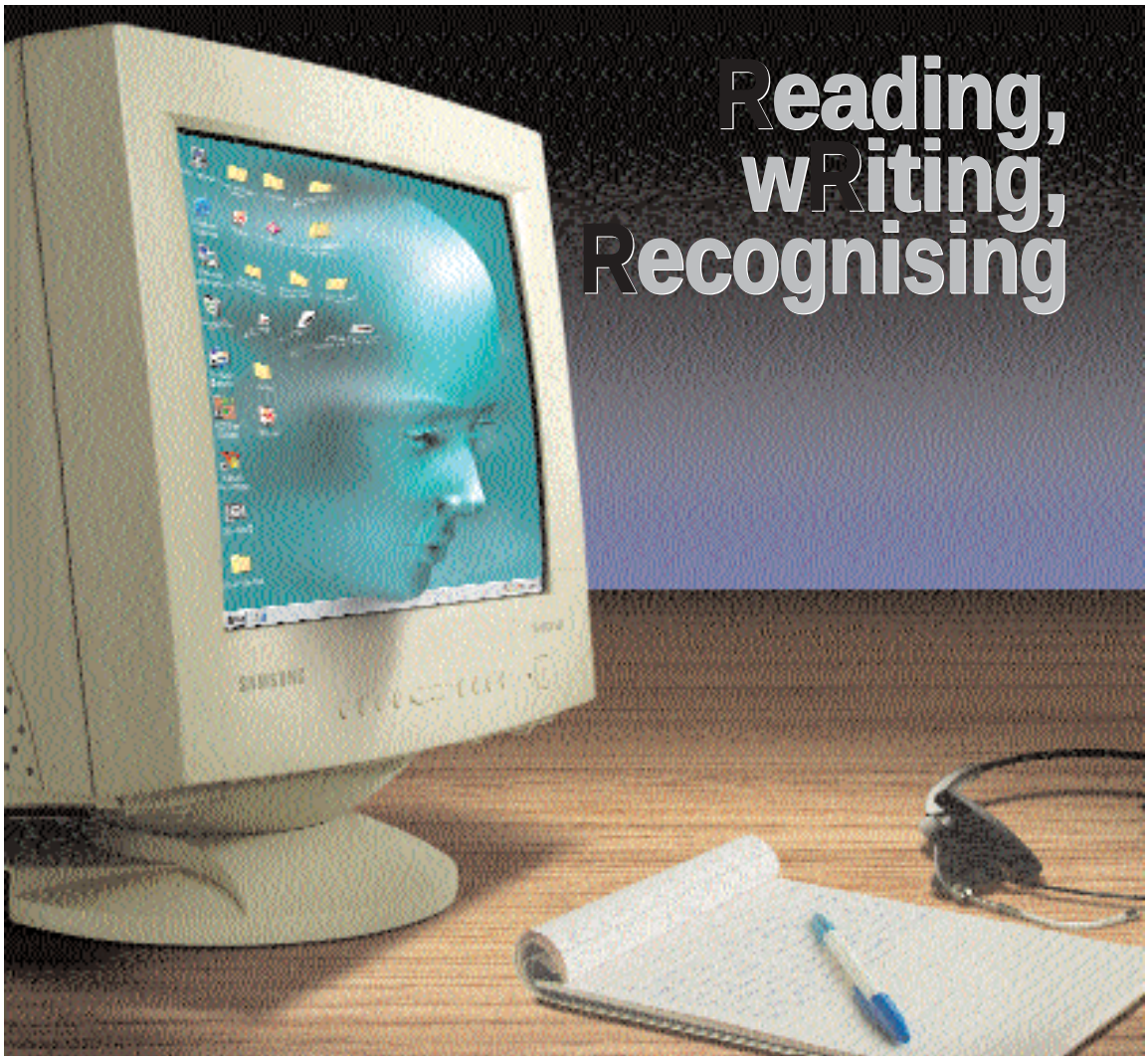


Atul Deshmukh

Advances in speech and handwriting recognition promise to move us away from the desktop

The desktop is at the centre of most computing today. This is the exact opposite of what proponents of Ubiquitous Computing, or Ubicomp, envisage—they believe that computers should become invisible, blending into the fabric of our daily lives. We should not need to know what they're like, or how they work—no more than you need to know about printing technology, how paper is made and where ink comes from. The goal of Ubicomp is silent computers everywhere, not thrusting their presence upon us as today's desktops and laptops do.

With computers all over the place, communication is the imperative. It seems obvious that each machine would require us to learn something new in order to communicate with it—pushing buttons on a telephone, typing on a keyboard, etc. But it's not obvious at all that the machine should dictate how we behave. Intuitively, it should be the other way round. We should be able to communicate with our machines the way we do with people. Ubicomp is a lofty proposition, but its ideals drive development, albeit not overtly—think PDAs, cell phones and Bluetooth. As a first step towards Ubicomp, we expect that our basic means of communication—speech and writing—should be easily interpreted by our machines.

Today's best speech recognisers approach 99 per cent accuracy, but they often fail when facilitating our interaction with computers. Why? Because the interfaces aren't transparent. Speech recognition (SR) is most visible today in dictation software. The setup involves a headset, which restricts freedom of movement. Next comes the training of the software, and training oneself to speak in such a way that the software understands. Dictation is a skill, not a natural mode of speech, and worse, small errors can be frustrating; when an error needs correction, you have to switch from speaking to typing. Infusing the software with AI capabilities is not the answer. For a computer to routinely understand natural commands such as "no, not 't', make that a 'd'", it needs to understand natural language—a far harder problem than voice recognition.

We can't yet talk with our machines; we can only instruct them to do specific things. The problem is that we live and talk in 'conversational' mode, within which people understand us. A computer requires us to get into 'command' mode. Experts expect that this will soon change; the state of the art of SR is much more promising than it was just a decade ago. Accuracies have improved, dictation speeds have increased and costs have fallen dramatically.

What you say

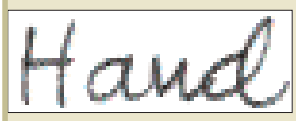
Spoken sentences can be broken into three basic levels: the phoneme level, the word level and the sentence level. A typical SR system analyses speech essentially by identifying phonemes, and looking at how they are strung together. Three steps are required to extract a complete sentence from a speech waveform: identifying the phoneme, the word and the sentence. Most SR systems model these as Hidden Markov Models (HMMs) (See box 'Hidden Markov Models' on Page 100). Alternatives to HMM systems include hybrid systems that use both artificial neural networks (ANNs) and HMMs.

When an HMM is used, the system is constantly making guesses as to what was said. For an English SR system, all the phonemes used in English would be modelled as HMMs. This modelling is done with extensive training from sound dictionaries—for instance, from newspapers and books, spoken by different people with different accents, at different times. After training, the system has a good idea of what each phoneme sounds like. Having heard the letter 'F' thousands of times, spoken at different times by different speakers in reference to different words, the HMM that the system constructs for that sound accounts for variations amongst speakers, and is sufficiently different from the HMM for the sounds of the letter 'S'. Besides, if an SR system is trained by the user, it modifies its phoneme dictionary to reflect the user's speech peculiarities.

After recognising phonemes, the system needs to put these together into words. This again involves guessing: faced with a sequence of sounds, the system guesses what phonemes must have been uttered to make the sequence. HMMs may again be used in this step. Once the sequence of phonemes has been guessed, it must be constrained into a valid word, for which purpose a dictionary is used. Some systems use HMMs to model the grammaticality of sentences. Such a system would interpret 'he read a book' correctly, instead of as 'he red a book'—because the latter is not a valid sentence, even though the two sound identical.

HR: The Segmentation Problem

One of the most studied problems in HR is that of segmentation: finding the boundaries between letters.



In the text here, segmentation is relatively easy

In contrast, when the word is written this way, segmentation is more difficult

Advanced algorithms make use of heuristics to guess the correct segmentation points

The written word

Intuitively, it seems that handwriting recognition (HR) is harder than recognising speech. After all, most people pronounce the letter 's' pretty much the same way, but most people don't write 's' the same way, especially doctors! In fact, the immense variation in the way people write is one of the biggest problems in HR. Writing a letter at a time, carefully, with all the right strokes, is not an option we'd like; we want to write in quick scribbles, the way we normally do.

HR technology is driven, in large part, by the emergence of portable devices, and the focus of computing shifting away from the desktop to cell phones, PDAs and tablet PCs. HR can be notoriously bad on some devices, if we write the way we want, without following the rules; And if we do follow the rules, we know how confining it feels. The lists of rules is long—write on the line, write in mixed upper and lower cases, leave a good gap between words. And when an error occurs, use the keyboard to correct it—which, if it happens too often, defeats the whole point of HR. Systems still need to get to the point where they don't require you to write to their convenience. But how exactly does HR work, and what can we expect in the future?

Recognising handwriting

HR systems vary in the way they detect words, and several methodologies are being explored. In HR, unlike in SR, the basic unit is the word, since there's always a space between words. Some systems work upon the movements the writer made in the process of writing; some work upon the shape of the letters produced. Within the latter category, some systems try to guess a word as a whole, while others try to break apart a word into letters.

Many systems, such as the Tablet PC, use ANNs as part of their recognition engines. ANNs have the advantage of being trainable. To get a feel for how ANNs can be taught simple characters, check out the Java applet at ***http://members.aol.com/Trane64/java/JRec.html***. An executable program demonstrating the same idea, developed at Carnegie-Mellon University (CMU), USA, is available at ***http://www.andrew.cmu.edu/~jgo/hwrecog.htm***.

The input to the system—say a typical system that uses a neural net, and breaks apart a word into letter segments—is an image of the handwriting to be recognised. This image needs to be pixelised and digitised before it can be used.

The first step the system would perform is the pre-processing of the image-detecting where the handwriting is within the image, removing 'noise' such as stray marks, and possibly the application of algorithms that

Jargon Buster

Phoneme: A phoneme is a basic unit of spoken sound: for example, the sound of the 'f' in 'father', or the sound of the 'ee' in 'sleep'.

Artificial Neural Network (ANN): A layered network of computing units, each of which can perform only a very simple operation. The computational utility of the network comes from the way the units are connected.

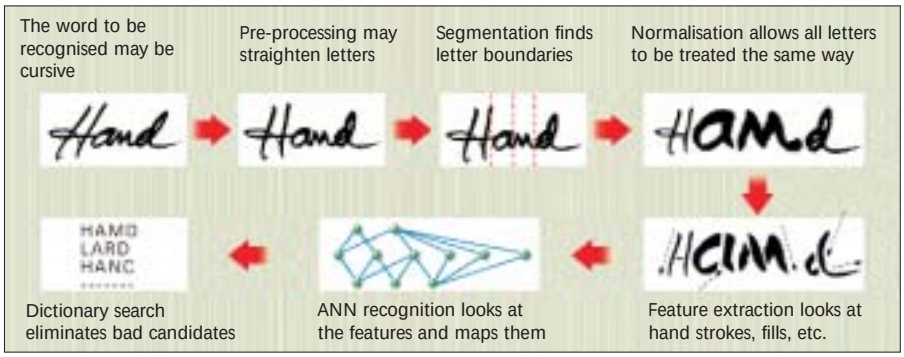
Handwriting recognition: The technique by which, for example, words written on a PDA using a stylus, are analysed and converted to text.

Dyslexia: A condition characterised by difficulty in reading, spelling and so on. This makes it a learning disability. Sometimes, it is accompanied by difficulty in writing as well.

Dysgraphia: A condition characterized by severe difficulty in writing by hand.

Natural Language Processing (NLP): The processing, by a machine, of everyday speech and writing, resulting in the machine getting at the meaning of what was said or written.

Machine learning: The discipline dealing with techniques that enable machines to learn from past experience and data, and possibly predict future data.



Typical stages in handwriting recognition using a neural net

give a uniform size to the text, straighten slanted lines in cursive writing, etc.

The most difficult part of the process is segmentation, i.e., breaking up the image into meaningful components, often single letters. Letter boundaries are hinted at by features such as changes in thickness, a change in slant, a small gap, etc. Using these, the segmentation process tries to isolate the letters in a word. The isolated letters may later be analysed according to their overall structure, or by individual features.

Segmentation is helped if the input is online—that is, if writing and recognition are being done simultaneously—because the system then has additional parameters to work on such as changes in pressure, small time gaps and so on.

After the letters have been demarcated, each letter or character is recognised by the ANN. The features that the system looks at are essentially the building blocks of written text—vertical and horizontal strokes, curves, circles, etc. Contextualization comes in here: isolated characters are usually not fed to the ANN—it's usually small groups. This improves accuracy. For example, when writing the word 'her', say the 'h' looks more like a 'b'; the word will still be recognised correctly as 'her', because 'ber' isn't a word. After recognition, dictionary-based correction completes the process: if a word that's not a valid dictionary word turns up, it's replaced by the closest match. Several HR systems can learn, and thus get personalised to one's writing peculiarities. This leads to better accuracy.

Where theory ends and problems begin

The applications of speech recognition extend far beyond dictation software. As we move away from the desktop and towards 'computers everywhere', we also move towards 'speech recognition everywhere'. However, there is no one-size-fits-all SR application: the demands of different areas are different.

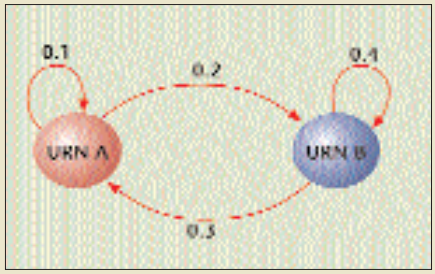
Consider voice recognition in a car. Hands-free mobile phone use is one thing, but what about voice-controlled, automated steering and guidance? Here, accuracy is of paramount importance, and there is very little space for 'ums' and 'ers'. The speaker must conform to speech-quality standards, and the software must be as accurate as possible. Fortunately, in such applications, the vocabulary the system needs to have is limited, making the task somewhat easier.

Background noise is a common problem with SR, and will remain so—even when partially remedied by noise-cancelling microphones. Consider the application of SR in labs, or in classrooms, where researchers take down notes while working with equipment; or where a lecturer's speech is automatically transcribed and presented to students after the lecture. Elimination of background noise is essential to good reproduction in these scenarios.

An interesting application is where software trains students to speak a language properly, with the correct accent and nuances of pronunciation. This poses a unique problem—a trade-off between how much the software should

Hidden Markov Models

HMMs are used to model what might be happening in a system, when there are both known and unknown parameters. In speech, the known parameters are the sounds that are heard, and the unknown parameters are what the speaker actually said. We need to try and guess the latter from the former. A simple way of understanding HMMs is via the urns and balls model. Think of two urns, each containing both red and blue balls. A genie keeps jumping back and forth between them. Each time he stops at an urn, he picks out a ball, and calls out what colour it is. We can hear him say the colour, but we don't know what urn he's calling out from. So, the urns are the unknown parameters, and the colour of the ball is the known parameter.



Probabilities of the genie jumping between, or staying at, urns A and B

Say the probability of the genie jumping, or transitioning, between urns A and B, is as below:

This means that the probability of the genie staying at urn A is 0.1, of going to B from A is 0.2, and so on. Assume that the initial probability of the genie being at A is 0.4, and of being at B is 0.6.

URN	A	B
Probability that a ball is red	0.3	0.6
Probability that a ball is blue	0.7	0.4

Now, suppose that the probabilities of red and blue balls being in urns A and B respectively is as follows:

Say we've heard the genie call out, in succession, "red", "blue" and "red". What sequences of moves by the genie could have produced this utterance, and with what probabilities? These can be calculated.

The probability that the genie was at urn A all three times, is

0.4*.3 + .1*.7 + .1*.3 = 0.22.

This means that the sequence was 'AAA' with a 22 per cent probability. The probability that he jumped from B to A and then back to B, is:

0.6*.6 + .3*.7 + .2*.6 = 0.69.

This means that the sequence was 'BAB' with a probability of 69 per cent, and so on. Thus, given a sequence we can estimate, using an HMM, the underlying sequence that produced it.

compensate for the speaker. If it compensates often, students may never discover that they pronounced a word badly; if it compensates too little, there would be too many errors.

The application of SR towards helping people with disabilities such as dyslexia or dysgraphia, is yet another challenge. Those who cannot use a keyboard, or notepad, can benefit tremendously from SR technology. However, the software would need to be tailored to individual cases, because of variations of the conditions amongst sufferers.

Among the many commercial applications of SR, is the automation of call centres and the like, as well as voice systems that take orders over the phone. A problem area here is the variability in telephone microphones, along with, of course, a caller's telephone habits—such as how far away from the mouth he or she holds the mouthpiece. Such difficulties are not insurmountable, but they go to show that research that merely attempts to improve accuracy is not enough.

What's being done

Although SR has been around for quite a while, it's only recently that it's taken off. One reason is that processor and memory requirements are relatively high, and it's only now, when memories and processors are more powerful and affordable, that powerful SR applications have been made possible.

Research into good models of how we construct our speech will continue. SR technology may benefit from research in other areas—Natural Language Processing, and Machine Learning, for example. The phonemic model of speech has been very successful, but it is by no means the only model. At CMU, alternatives such as the modelling of speech based on syllables are being studied. Also being developed at CMU, are language models that automatically detect, and adapt to, changes in the form and the content of what is being spoken—the speaker's pronunciation and vocabulary, and even what he, or she, is talking about.

Yet another problem being addressed at CMU is that of the transcribing of pronunciations for thousands and thousands of words: in the training phase of an SR system, a linguist needs to read out volumes of text, in a consistent tone, volume, etc. Methods of automatically generating pronunciations for new words, from training examples, are being devised.

What we should see

Speech and handwriting recognition technologies can only get better each year. The fact that Microsoft bundles dictation and handwriting software with Office XP 2003, is an indication of how ubiquitous they will become.

It is expected that pen input systems will replace some, if not all, keyboards. Devices such as the SmartQuill hold special promise.

Pen computing may have other implications as well. The Roman alphabet has a special status in the world today. More ubiquitous speech and handwriting recognition could change that. As things stand, people who don't use the Roman alphabet are on the other side of the 'keyboard divide': using computers entails acquiring keyboard skills that don't come intuitively. Consider someone who speaks an Indian language, he or she needs to press three keys on a QWERTY keyboard to get a character, and think of what pen-based input could do for him or her.

Also, it's natural that translation services, together with natural-input recognition systems, would bridge international computing boundaries.

Peter Fleming, president of Aristotle Systems, a speech-technology consulting firm, has some realistic predictions for SR in the years to come. He predicts, "Greater 'programmed understanding' of grammar and syntax will improve accurate recognition… Keyboards, mice and electronic pens will become more closely integrated with speech recognition… Microphone positioning and usage will become more natural; more use will be made of common sense in choosing the correct word for a particular context." However, he also says, "Dictation speech recognition will never become the universal and exclusive data input method."

As we inch towards transparent computing—and eventually Ubicomp—one small step at a time, two things are clear: advances in speech and handwriting recognition will drive much of the transition; and, as we learn to communicate more directly with our machines, there must be a compromise. Until NLP and other AI problems are solved, we will continue to compensate for what the machine lacks. And hope that, as time advances, this needed compensation will diminish.

RAM MOHAN RAO
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Areas Of Application

Flight and combat: The British Eurofighter Typhoon is the first combat aircraft to have speech recognition as a standard part of the input system. The pilot can issue voice instructions, and have spoken questions answered by the system. This way, the pilot need not look down at buttons, dials, LCD screens, etc., and is free to navigate in a more natural manner.

Automated surgery: AESOP 2000 is a surgical robot that takes commands that tell it where to hold a particular instrument. This is used in keyhole surgery, which involves the surgeon looking through a tiny opening in the skin, as happens in endoscopy.

Translation: Automated translation has been researched for long, and translation systems for PDAs will soon hit the market. The speaker speaks in his native language into the PDA, which then translates the text into the chosen language, and speaks it aloud.

Household appliances: Sensory Incorporated sells their VoiceDirect Speech Recognition Kit for less than $50 (approximately Rs 2,300). The kit comes with everything one needs to speech-enable household appliances and devices such as remotes and telephones. One simply needs to wire up the devices according to the setup procedure, and train the system with commands, such as 'power on'.

www.technologyreview.com/articles/rnb_121903.asp: A system whereby a speaker speaks into a PDA in one language, and the PDA speaks out a translation in another

www.india-today.com/ctoday/19991201/marvels.html: A description of how speech recognition is incorporated in the Eurofighter Typhoon

http://research.microsoft.com/news/msrnews/smartquill.aspx: A page about the SmartQuill, a device that captures handwriting strokes in its own memory

www.pencomputing.com: A perspective on pen computing, current and future

www.ubiq.com/hypertext/weiser/UbiHome.html: Mark Weiser's page on Ubiquitous Computing, with several write-ups and papers

30 Minutes Expert

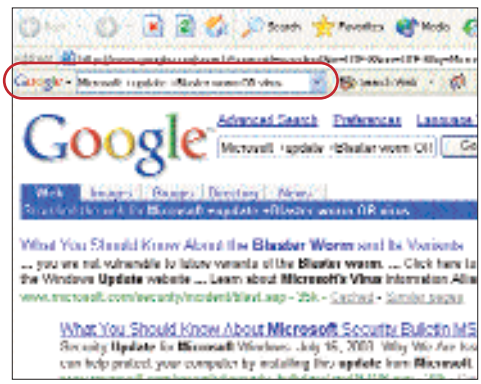
Searching by bar

Using search engines to look for information is passé. Tap the power of search tools

Wouldn't it be easy if you could search the Web directly, without waiting for the Web page of a search engine to load? It is, given the right tools. You can set the toolbar of the search engine of your choice (Google, Opera, Netscape, etc.) on your desktop, and search from there.

STEP 1 Download and install Google toolbar from ***http://toolbar.google.com/***. Double-click the Internet Explorer icon on the desktop to load IE. Next, right-click on any of the toolbars, you will see additional options such as Links, Addresses, Standard Buttons, etc. Click on 'Google' to load the toolbar. The toolbar has a text field, and buttons—'Search the Web', 'Navigate the Google News site', a graphical button to block pop-ups, an Autofill tool for Web forms, a blog updater and a button that enables or disables the highlighting of search words on the resultant page.

STEP 2 To search, just enter the search string into the text field of the Google toolbar and hit [Enter]. You can also specify Boolean text searches in the same text field area.



Use the Google toolbar to search Google directly

The Google deskbar

The Google Deskbar (***http://toolbar.google.com/deskbar/***) is an add-on to your taskbar from where you can initiate any search directly. It displays the search results in a small window on the desktop

The Google Deskbar displays search results in its mini-viewer

itself. The results window retracts after short periods of time. To amend this, right-click on the taskbar and select ***Toolbars > Google Deskbar***. A small text search field appears on the right-hand corner of your Windows Taskbar. You can also configure it to open the search link inside a separate browser window. Click on the arrow beside the binoculars, and in the menu that pops up, click on Options. Here, under the Mini-viewer tab, check the 'Display search results within mini-viewer' box. Check the 'When clicking on results, open a browser' box, to open results in a separate browser window. Enable the 'Automatically close the mini-viewer when you leave it' option to close the Deskbar search pop-up when your mouse cursor leaves the pop-up window area. Uncheck 'Use animated open and close' for disabling animation displays.

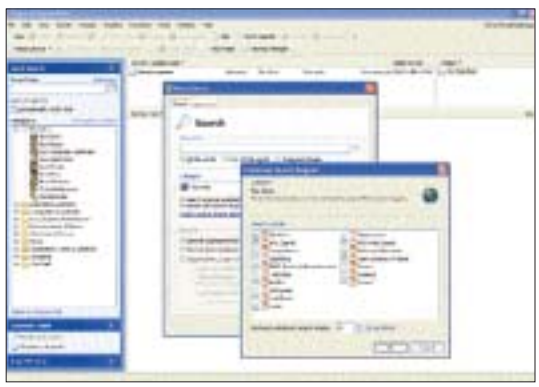
Other tools

Copernic Agent is another popular search tool that integrates into search engines and produces results available to them.

STEP 1 Download and install Copernic agent from ***http://www.copernic.com/en/products/agent/download.html***. Start Copernic Agent, click on the left-hand pane and select Advanced. A small window pops up for you to enter your search. Click on 'Modify search engine settings' to open a small window that lists all the search engines it uses as reference engines—AltaVista, AOL, etc. Select all for more results, or deselect those you do not want to use. Click OK to exit.

STEP 2 Copernic spreads a wide array of search engines at your disposal. The results are listed relevance-wise, which is indicated in percentages.

Click on the link displayed on the right-hand bottom half of the pane to browse through the results. This loads the Web site in the default browser.



Use Copernic to select the default search engines you want to use to perform your searches

Change the default browser by going to ***Tools > Options > Browser***. Here, you can also specify a browser of your choice by clicking on Alternate, and specifying the path to that browser. Click on OK to close the window.

With so many search tools at your disposal, it shouldn't be difficult to find the information you require!

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Map your Mind

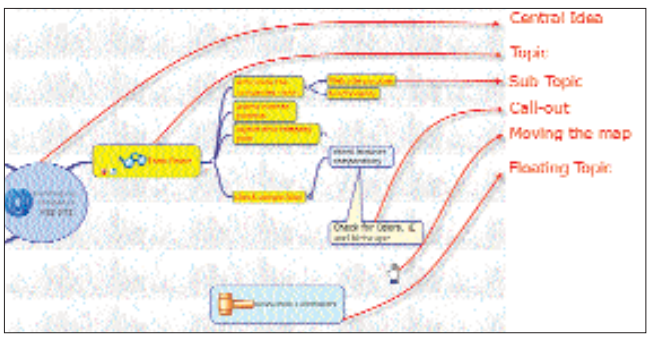
Think your thoughts are adrift? Here's how you chart ramblings to plan, organise and execute

Planning, strategy and venom—your boss's favourite topics when a project goes asunder. So, you sit down all over again to plot and plan. You'd like to fly off to Ibiza; instead, you fly helter-skelter with strategies on your mind. "Do whatever it takes to stimulate that pea-sized brain of yours," he growls. Then you remind yourself of taking into account outcomes that just might not be savoury. Oh damn, your thought process is complication personified! Well, you need to sit back, organise and structure it out.

Mind mapping is a technique that organises your thoughts in a representative way using words, symbols and pictures, and goes a step further by letting you manage all the content associated with these thoughts. It works on the principle that the eyes and the brain focus on the central image on the screen or a paper. This central image is the main idea of the thought process in mind mapping. From this central image, arise branches, representing the main themes that relate to the central idea. These have sub-branches that go to many levels, making a tree-like structure. Thus, a mind map is a flexible, pleasing, easy-to-understand and easy-to-memorise document.

Creating your first mind map

Though there are numerous tools to create mind maps, we will focus on Mindjet's MindManager. The reason? It's one of the best. Install the latest version—MindManager X5—from our Mindware CD or download it from ***www.mindjet.com***.



The structure of a typical mind map looks something like this

The interface is quite intuitive and similar to that of Microsoft Office products. Placed just below the Menu bar, the Toolbar has buttons for common functions such as Save, Edit, etc. Move your mouse pointer over the button and a balloon tip displays its function, and its keyboard shortcut. Below the toolbar lies the Action Bar that has buttons such as Map View and Outline View, to switch between different map views. Use buttons such as Brainstorm, Review and Presentation to switch between different modes.

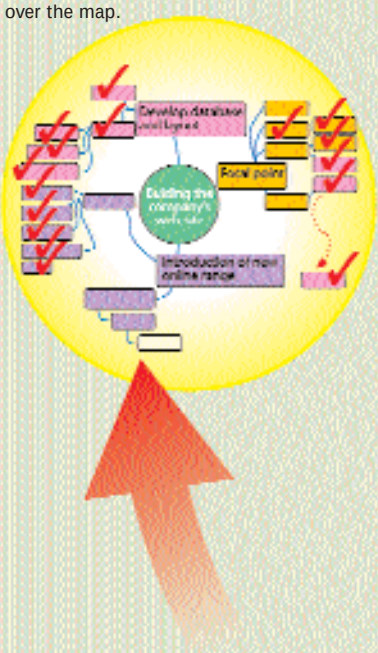
Change fonts, colours, line types and shapes in the map using the formatting toolbar that's, by default, placed at the bottom. The export toolbar, also placed there, allows for integration of MindManager with Microsoft Office. To the right are icons for the task pane that let you access Library, Search, etc., while you work on a map.

To chart a basic map, fundamental elements needed are the Central Topic, Main Topics, Sub-Topics, Floating Topics and Callouts. The first three elements form the tree-like structure of the map. Floating topics are not attached to any branch, and callouts are used for comments. Create a blank map ***(File > New > Blank Map)***, click 'Central Topic', enter the title of your map and press [Enter]. Press [Enter] once more to key in the main topic, and hit [Enter] again. Sounds confusing? Here are two rules to dissipate those baffling mists—Rule 1: Press [Enter] after typing any text; Rule 2: Select any particular topic, and press [Enter]. *Voila!* You have a topic at the same level as the one that was selected. To create a topic at a lower level, you need to press [Insert].

Click on empty space, and type to create a floating topic. Mouse-clicks are a little tricky in MindManager—click and hold the left mouse button down to change the mouse pointer to a hand that you can use to drag

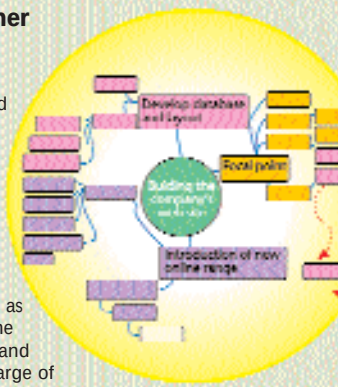
Step 5: Project completed

Now your Mind Map is ready to be used to track progress. When individual tasks are completed, you can put an icon to show so. When all the tasks are completed, you will see checkmarks all over the map.



Step 4: Further planning

Now look at the tree carefully, and delete the unwanted ideas, finalise the tasks and allot them to people in your team. On each task, you can enter information such as the date when the task was alotted and the person in charge of it. You can update this information at will.

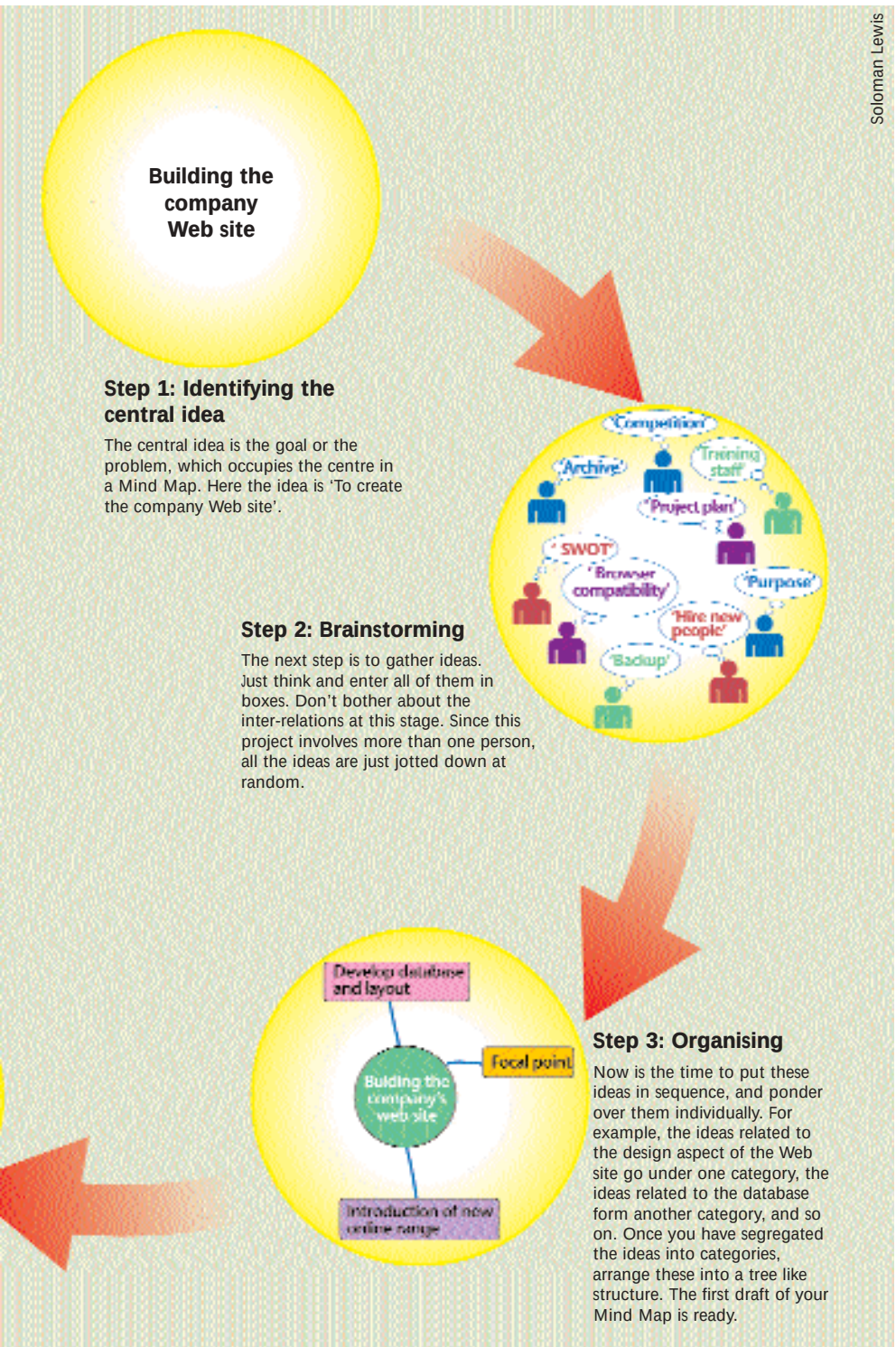


the map. A rectangle appears if you click and drag immediately; left-click and release it instantly, and you have a little triangle. These are spaces where you type your thoughts. Move this floating topic anywhere by simply dragging it.

As for callouts, click the topic you want to create them for, press ***[Ctrl] + [Shift] + [Enter]***, type in the text and press [Enter]. You can also insert these components using the Insert menu, and the buttons on the standard toolbar.

Reorganising your mind map

The biggest advantage of using software to create mind maps is flexibility. You can do just about anything in a mind map—move topics and sub-topics, make a topic



Step 1: Identifying the central idea

The central idea is the goal or the problem, which occupies the centre in a Mind Map. Here the idea is 'To create the company Web site'.

Step 2: Brainstorming

The next step is to gather ideas. Just think and enter all of them in boxes. Don't bother about the inter-relations at this stage. Since this project involves more than one person, all the ideas are just jotted down at random.

Step 3: Organising

Now is the time to put these ideas in sequence, and ponder over them individually. For example, the ideas related to the design aspect of the Web site go under one category, the ideas related to the database form another category, and so on. Once you have segregated the ideas into categories, arrange these into a tree like structure. The first draft of your Mind Map is ready.

Draw on Mind Maps

Mind maps are used for two things—memory and creativity. Though managers and students make the most out of it, mind maps can be useful to anyone. Here are some areas where you can put these to use.

Self-analysis: Use it to analyse your needs and future goals. Long-term decisions such as career switches are taken effectively using this tool. Look at the direction the thoughts in your map take you, and you have a decision at hand!

Diary: Unlike a conventional planner, a mind map diary can be used for time management—write little notes pertaining to the time at which you need things done. It can also be used to record events in a memorable and interesting manner—map your holiday trips, for example, and attach your anecdotes to the 'places' where they occurred.

Group study: It has been found that, together with group study, the Mind Map Organic Study Technique (MMOST) increases the pace, understanding, effectiveness and efficiency of learning. Visit ***http://www.mindmapping.co.uk/studying. htm*** and ***http://www.happychild.org.uk/acc/ tpr/features/0109mmap.htm*** for more information on MMOST.

Creative Writing: Arrange and re-arrange your thoughts before you begin to write using this tool. Students will find this technique very useful to write essays, just as this writer did for this story.

Exam preparations: Make notes while studying, so that you can review them later. You can also map your answers to cover all points.

Teaching: Plan lessons, presentations, projects and examinations.

Speeches or lectures: Mind maps can also be used to structure your thoughts before you give a speech.

Meetings: Ideas generated by meetings and brainstorming can be very well arranged in a mind map. You can collect ideas and arrange them into logical groups, for an easy analysis.

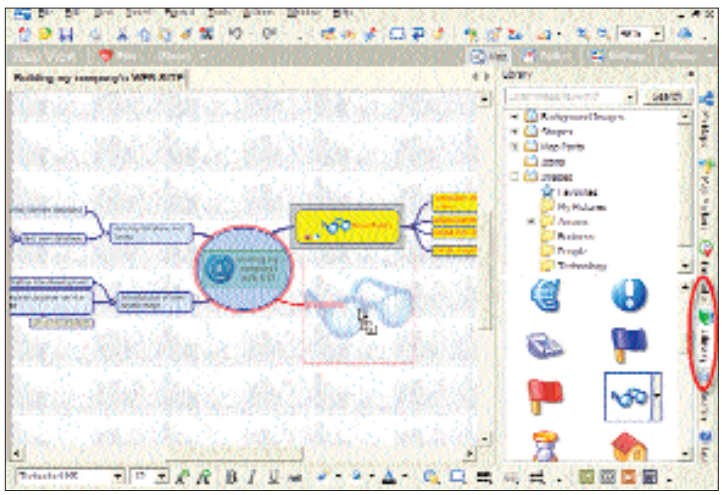
Business: Structure a complete company with this tool. It is also a very powerful marketing and planning tool.

a callout and a callout a topic. Moving the focus between the components of a map is also very easy. Use [Tab] to jump to the next topic in the clockwise direction, and ***[Shift] + [Tab]*** to move counter-clockwise. You can also use the arrow keys to move in the respective direction. You can even move the entire map. Click on the background, hold the left mouse button till the pointer changes to a hand, and then drag.

To reorganise the map, click the topic you want to move, and drag it to the new location. A visual clue shows you the position where this topic will be placed. If you press and hold [Ctrl] while dragging and dropping, a copy of that topic is created and placed at the new location. Delete a topic with all its sub-topics, by selecting it and pressing [Del]. If you wish to do away with just the topic, press ***[Ctrl] + [Del]*** instead.

Formatting your mind map

Make your maps visually distinct to enhance their appeal. Use the inbuilt styles, or create and use your own style. Go to ***Format > Style > Assign from Template Organizer...***, choose a style and click OK. Individually formatted elements won't be touched. Format them using the Formatting toolbar at the bottom of MindManager. Change fonts, colours, add shapes, boundaries and lines. Use the Library tab to insert an image that links to a topic, or just floats freely.



Insert images using the Library task pane to create visually appealing maps

Fine-tuning maps

To make your maps easy to comprehend—which is their intent—keep topics as short as possible. Use notes to attach additional information to a topic. Notes come in useful when exporting maps to Web pages or a Microsoft Word document. Select the topic and press ***[Ctrl] + [T]***, or go to ***Insert > Notes.*** This opens the Topic Notes window for you to type your notes, which can contain formatted text, links and images. Topics with notes attached, display an icon next to them in the map view. Move your mouse over this icon to read the note.

Another useful component is Task Information, which helps to schedule, pri-

Sites to Visit

Here is a list of software that you can use to create mind maps:

Windows software

MindGenius Business (*http://www.mindgenius.com/website/home.aspx*): Plan those business moves as you move up the ladder. Different versions of this software let you chart your education, and even daily chores.

Visual Mind 5.01 (*http://www.visual-mind.com/wv2.htm?335351*): This software closely competes with MindManager in terms of simplicity.

PDA Software

MindManager 2002 Mobile Edition (*http://www.mindjet.com/us/products/compare.php*): Here's a PDA version of the software:

Idea Pad for Palm (*http://www.palmgear.com/index.cfm?fuseaction=software.showsoftware&prodid=53084*): Use it to create a work pattern in the Palm of your hand!

Free Software

FreeMind: (*http://freemind.sourceforge.net/*) Prioritise your goals and draw up an action plan with FreeMind, written in Java.

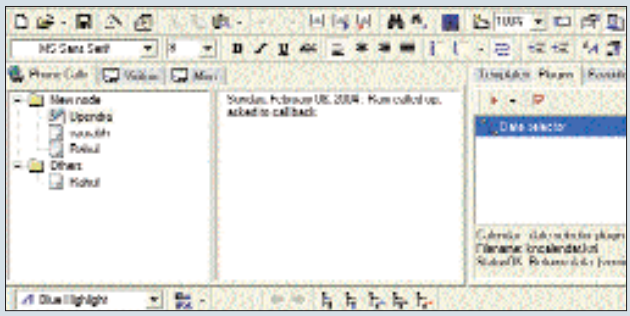
KeyNotes

Written in Borland Delphi, KeyNote helps you organise textual information. This notebook, or information manager, has an extremely configurable tabbed interface, an RTF editor and a hierarchical tree outline.

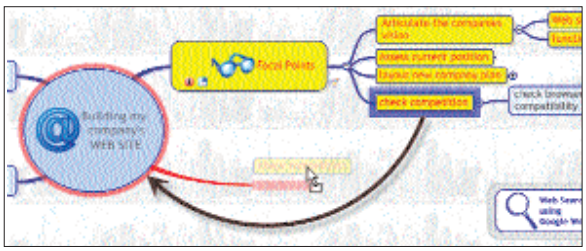
Available only for Windows, KeyNote is useful in situations wherein you open several text files, and later have trouble organising and then searching for information in them. With KeyNote, you can have many notes within one file and multi-level, nested pages within a single note. It also encrypts your data. Some of its features, such as virtual nodes, per-file configuration settings, multiple backups or WordWeb integration, are generally not found in this type of software.

Go to ***File > New File*** to create a new KeyNote file with a single note. Add more notes by going to ***Note > New Note***. In the 'New Note' dialog box, choose 'Multi-level tree' in the Type drop-down list, and click OK. Once you give a filename, it's saved automatically, so you don't have to bother about saving it repeatedly.

A tree-type note is similar to Windows Explorer. Its interface comprises a tree panel to the left, and the normal editor to the right. Add more nodes to your file by right-clicking the node and choosing 'Add Node'. Arrange the nodes by dragging and dropping them within the tree.



Forget the text files, start using KeyNote for well-arranged notes



Mind Mapping flexibility lets you move any topic or sub-topic by simply dragging and dropping

oritise, assign and group tasks. Click the Task Info tab to open the Task Info task pane. Now select the topic, and fill in the details such as Priority, Start Date, Due Date, Completed (%), Duration, Resources and Categories. Special icons appear in the topics to denote task information. Use this information to view parts of the map with specific task information. This can be done using the Map Markers tab.

Integration with Office

A feature that has made MindManager popular is its seamless integration with Word, Project, Powerpoint and Outlook. Import a Word or Project document by opening it in MindManager using ***File > Open***. Ensure that you choose the appropriate file type. The map thus created uses the formatting of the Word document. It creates a hierarchy of topics based on the headers in the Word document. The remaining text is imported as notes. MindManager creates two buttons in Outlook—one to export selected items, the other to export the folder. In Word and Project, it's just the 'Send to MindManager' button.

You can also use the Export toolbar to export maps to Office applications. Here, the topics are arranged according to hierarchy in the map, and formatted using the Word style sheet. PowerPoint creates slides based on the map structure. If you want to export only selected topics, you can do so by going to ***File > Send To***, and then choosing the application to which to export.

Integration with Outlook provides a two-way communication that lets you synchronise tasks. First, you need to either import Outlook tasks into MindManager by going to ***Actions > Import Outlook Tasks...*** or export MindManager Maps to Outlook tasks. Synchronise your tasks by clicking the 'Synchronize Outlook tasks...' button on the Export toolbar.

Mind maps are a great way to get your thoughts to walk the line of order and method. Have second thoughts? Float them too into position. It's as simple as that.

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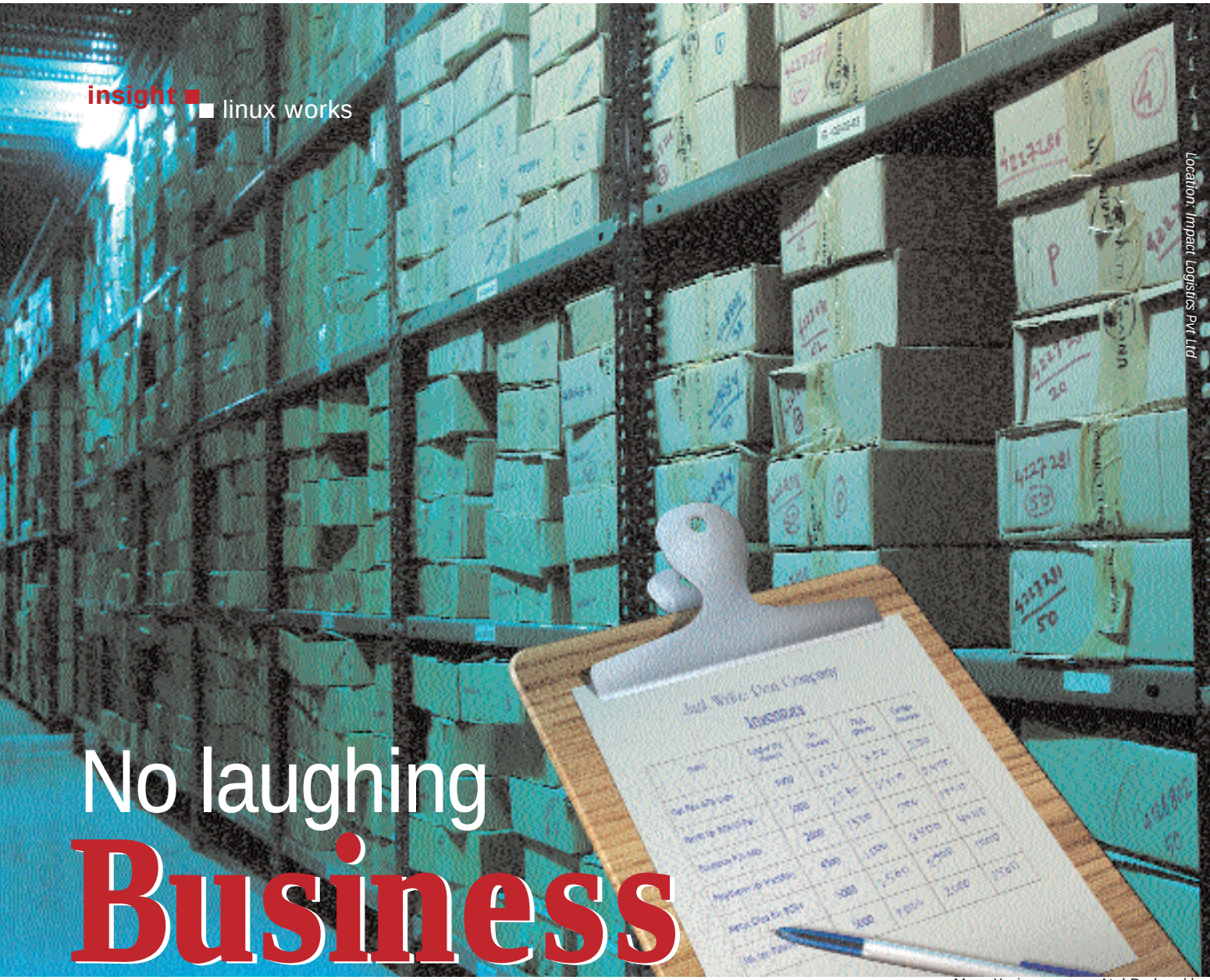


Location: Impact Logistics Pvt Ltd

No laughing Business

PHOTOGRAPHER: Mexy Xavier, IMAGING: Atul Deshmukh

Be it accounts, stock-taking, or the all-important payrolls, Nola can take 'em all on

The flexibility, stability and the power that Linux offers makes it a unanimous OS choice for business applications throughout the world. However, a long-established notion is that you need specialised software to get a grip on accounting, payroll and such taxing tasks when using Linux systems. And perhaps advertise for an 'experienced system administrator' who, though glum, is quite glib at keeping the system going.

Meet Nola, a software that helps you makes sense of all that *moolah* math with minimum effort. The best part is that it's PHP Hypertext Preprocessor (PHP)-based, so once you set it up on the server, all client machines can access it, irrespective of the OS they are running. Further, PHP lets you customise it in minutes, with just the basic knowledge of this famous server-side scripting language.

What you need

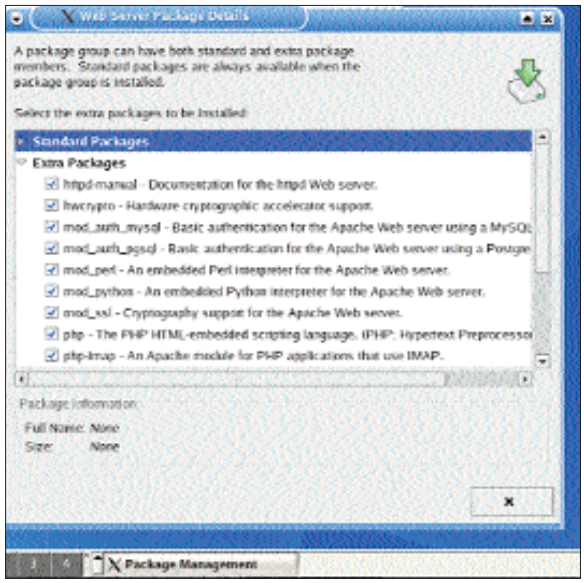
Nola is an open-source software that's written in PHP, and uses MySQL as its database. Distributed under General Public License (GNU) license, and developed by Noguska Management Systems, it's approximately 5 MB in size. Download it from ***http://nola.noguska.com/***.

It takes quite a while to install, courtesy its many dependencies. Here's a detailed list of them: Apache 1.3.21, OpenSSL 0.9.6b, Mod_SSL 2.8.4, Libjpeg 6b, Libpng 1.0.11, Tiff 3.5.6-beta, GD Library 1.8.4, Mhash 0.8.9, LibMcrypt 2.4.15, Mcrypt 2.5.7, PDFLib 4.0.1, Zlib 1.1.3, PHP 4.0.6 and MySql 3.23.4.1. That's pretty exhaustive, but in normal cases, you won't have to worry about anything except PHP, Apache and MySQL—all of which you need to configure before installing this suite.

Let's get started

Ensure that you have PHP, Apache and MySQL installed on your Linux system. If you did a complete install, these components are already installed. Check this in Red Hat Linux 9 by going to ***K menu > System Settings > Add / Remove Applications*** to start the Package Manager. Under the Server, check Web Server and click Details. Enable all the checkboxes, and click OK. Now, enable the SQL Database Server and click Details. Click OK after enabling all the checkboxes. To finish, click Update. Enter the Red Hat 9 installation CDs when it asks to complete the update. Don't worry about the other components, since they are installed by default.

Nola comes as a tar ball named nola-1.1.2.tar.gz. Extract this file to ***/var/www/html***—the default root directo-



If you are using Red Hat Linux 9, then you can easily add the components using the Package Management tool

ry for the Apache server. Verify this information in the ***/etc/httpd/conf/httpd.conf*** file that specifies this path as DocumentRoot ***"/var/www/html"***. To uncompress Nola, go to ***K menu > System Tools > Terminal*** and type ***'tar zxvf nola-1.1.2.tar.gz/var/ www/html/'.***

Next, change the ownership of this folder so that Apache can access this directory. When installed, Apache creates a user, called apache, who is a member of the group apache. Enter the ***'hown -R apache:apache /var/www/html/nola/'*** command to change the ownership to the user apache.

After this, enter ***'service mysqld start'*** and ***'service httpd start'*** to start the Apache and MySQL services. It's now time to configure MySQL by creating a database that can be used by Nola. For this, Nola has SQL scripts that you just need to execute. At the terminal, type ***'mysql -p < /var/www/html/nola/documentation/scripts/MySql/database.sql'*** to create a database named Noguska. Now, you need to fill up this database with basic data such as default user, etc, so that Nola runs properly. Type ***'mysql -p noguska </var/www/html/nola/documentation/scripts/MySql/filldata.sql'*** to do so.

Now, update the MySQL login information in the ***/var/www/html/nola/includes/define.php*** file. Change the default values of username and password to those specified for MySQL. If you have not changed the default values while installing MySQL, you don't need to change anything in the defines.php file.

Add the following lines in the ***/var/rc.local*** file to ensure that the mysqld and httpd services start every time you boot up your Linux system:

```
service mysqld start
service httpd start
sleep 8
clear
```

The last two lines guarantee that the services start in the background without distracting you.

That's it! Now, type ***'http:// localhost/nola'*** in the address bar of the Web browser, and the login prompt greets you. Log in using the default admin account with 'password' as its password. You will see the navigation bar on the left, and the main pages in the middle. At times, images just don't appear, leaving you with nothing to do. In this case, you may disable them and switch to text mode. To do so, open the file ***/var/www/html/nola/includes/defines.php*** and look for the section named '* Menu section'. It should have these lines:

```
//show menu items as images
define('MENU_SHOW_AS_IMAGE', '1');
//show explain items
define('EXPLAIN_SHOW_AS_IMAGE', '1');
//show icons on explain* sub-menus
define('EXPLAIN_SHOW_PICTURES', '1');
```

Change all the '1's in the above entries to '0's.

Now, when you refresh the Nola start page in the browser, it displays only text for navigation. Thus, the page takes lesser time to load, and the interface is simpler than before.

Setting up Nola

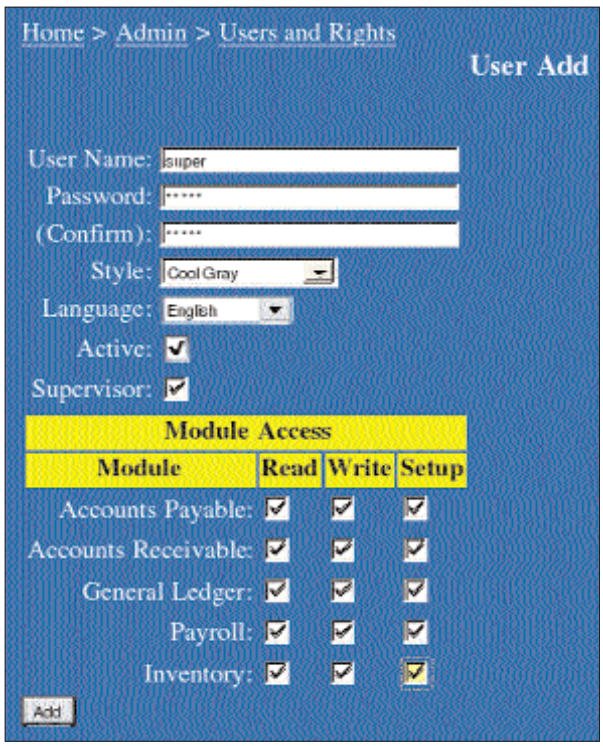
Before using Nola for your business operations, you need to set up certain things. First, go to the Admin section and edit the company name (by default, it is 'My Company - Edit Me') by clicking on Client Companies. Click the 'Edit Selected Company' button to enter your company's information. If you create multiple companies, these are listed at the top of the navigation bar as a drop-down list.

Next, change the default admin password by clicking Users and Rights. Create a new user by clicking on 'Add new user'. If you enable the Supervisor checkbox, the user gets administrative rights. Check the other checkboxes to assign users the rights to view, write and set up Nola modules such as Accounts Payable, Accounts Receivable, General Ledger, Payroll and Inventory.

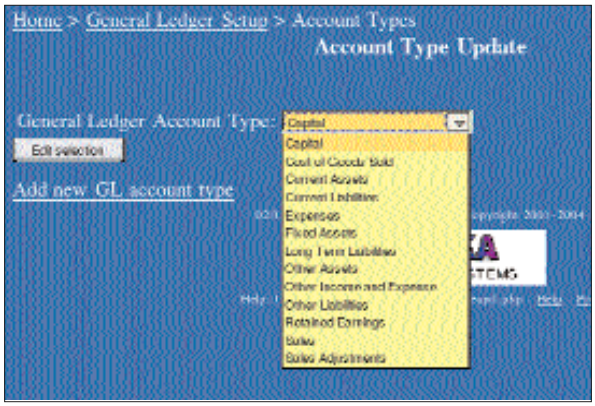
The Admin section also has options to create document categories. Here, you can specify the categories that users can upload. This is helpful when a user wants to upload a document such as a product's image that pertains to a particular transaction. Finally, this section also lets you import a customer list from a Comma Separated Values (CSV) file. The file structure should be as specified in the Help section of this page.

General ledger

Create financial accounts once you are through with the Admin section. By default, the basic account types such as Capital, Expenses, Sales, etc, are inbuilt. To create accounts of a different kind, go to ***General Ledger > Setup Function for General Ledger***. However, Nola cautions you that "this should only be done under the



Create uses with specific rights, under the Admin section of Nola

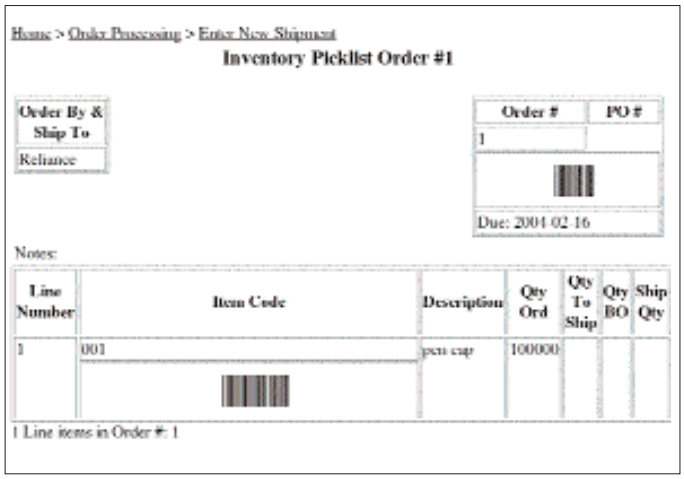


You can create any financial account under the preset account types

direction of Noguska Support staff as how these are entered affects all General Ledger reports and postings." To create new accounts, go to ***General Ledger > Edit Chart of Accounts,*** and click on 'Add new GL account'.

Start with the journal entries once the accounts are created. There's a two-step process to enter the credit and debit values when making a new journal entry. Remember to enter all the credit entries as negative values and debit entries as positive ones. Save the entry into the database by clicking on the 'Voucher <vouchernumber> Complete' link where '<vouchernumber>' is the one that you assign while making the entry.

In the General Ledger section, you will also find such self-explanatory links as Edit Journal Entries, Post Journal Now, Reverse Journal Entries, Profit and Loss Statement, Balance Sheet, Budget Variance, Journal Reports, My Pie Charts, Edit Chart of Accounts, Chart of Account List, Add Update Budget and Budget List.



You can print order forms with bar codes in just a few clicks

Vendors

Next, create a list of vendors by going to ***Vendors > Vendor Maintenance***. You have options to create new vendors, as well as modify existing ones. A useful link under the Vendors section is Vendor List / Labels, where you can create a CSV file of the data that can be imported into spreadsheet applications such as MS Excel. You will also find options that let you view a summary of all vendors and create mailing labels in PDF format.

Use the Purchase and Payables sections to view and enter information related to purchasing and payables respectively.

Placing orders

Access functions related to customers and their orders from the Order Entry section. Click the 'Add/Update Customer' link to add new customers to the database. Enter a new order using the 'New Order Standard Items' link. Under the Order List menu option, you will find links to view different orders and a link to view your Performance Statistics. Order Processing, present in the Order List, lets you Check In and Check Out orders, i.e., details about who took the job and when was it taken, and when it was returned. When that user starts working on the order, you can start the order by going to 'Fill Order Start / Stop'. Here a red button indicates that work is in progress. The button is marked 'Stopped' when clicked. A green button implies the reverse. You can also view the shipping status, and mark orders for shipping in this section. Billing information can be viewed and entered by going to the Billing section.

Inventory

Nola has a powerful and feature-rich inventory management for items that you manufacture. Go to ***Inventory > Setup Functions for Inventory*** and enter basic information such as plant location, item categories etc. Also, key in inventory units, pricing levels and few such essential fields. After you have entered all these details, go back to Inventory section. Here you can read and enter all the information about your inventory.

Nola also has a full-featured Payroll section for Payroll management. Here, you can enter employee database, calculate salaries, deduct taxes and lots more.

The last word

Thus, Nola lets you say a cheery *hola!* to the nitty-gritty of your company's finances, payrolls and stocktaking, etc., which is just a bit surprising for a Linux application. If you like the way it goes about accounting money, then you might like to try Nola Pro, its advanced version. Download the trial version from ***www.nolapro.com***, and have fun with those moneyed calculations!

UPENDRA SINGHAI
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Quick Tips

Work faster: Throughout the Nola interface, you will notice three types of icons, next to text boxes: the calendar icon, the lens icon and the plus sign icon.
Click on the calendar icon to open a small window displaying a calendar.
Use the lens icon to search for items, vendors, etc.
The plus icon lets you add items. Click Date to insert the same into the appropriate textbox.

PDF blues: Nola presents documents such as Vendors' Mailing List in the form of PDF files. if you encounter errors while creating PDF files, download and install the latest version of PDFlib 4.0.1 from ***www.pdflib.com.***

Path to path: The paths mentioned here assume that you are running Red Hat Linux 9.0. If you use some other version, you need to specify the path where Nola is installed, in the DocumentRoot section of the httpd.conf file. Normally, this is located in the /etc/httpd/conf/ folder.

Help on demand: Most Nola interface pages have a Help link just below the Noguska logo. Click this link to view related help topics in a pop-up window.

MIssing L2 caches, installer problems, Explorer crashes, Firmware upgrades, DOOMed installers, etc. You've got a problem? We've got the solution

Where's my L2 gone?

Q. I want to know what the L2 cache memory is, and why it is marked as 0 MB on my system. I have an Intel Celeron 1.7 GHz, 128 MB SDRAM, a 40 GB Seagate hard disk, a Mercury KOB82845 G/GL NDSMx motherboard with the Intel 845 GL chipset, onboard VGA and sound.

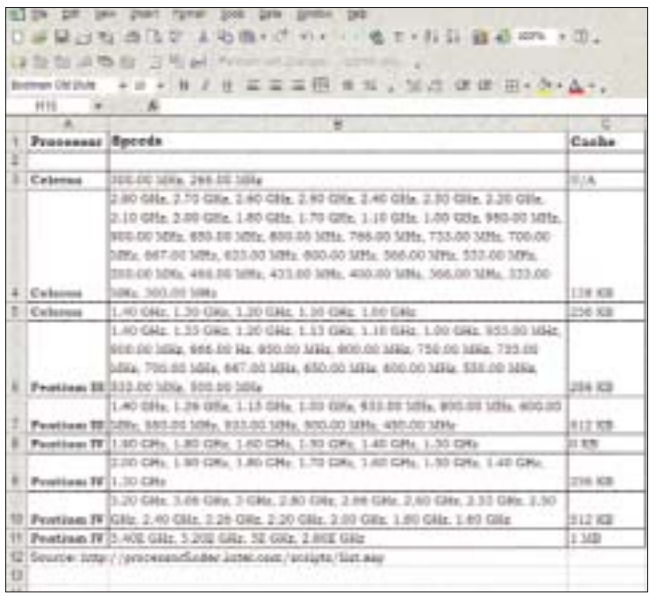
According to your October issue, a Pentium 4 has 256 KB of L2 cache, but my machine has 0 MB. I asked my computer vendor, but he knows nothing about it. My friend's PC, a Pentium 3, shows 256 KB of L2 cache. The performance of his computer is good.

I used the 'trial-and-error' method on the external cache option provided in the BIOS, but there was no performance difference. My friend's PC has DDR RAM. Is the L2 cache dependent on the type of RAM? Please help.

Gaurav Malji

A All CPUs have an inbuilt L2 cache, and it isn't dependent on the type of system memory you have, or anything like that. The L2 cache, which increases the CPU's performance, is inbuilt in the processor.

A Celeron 1.7 GHz processor should have 128 KB of L2 cache. There are two possibilities: the first is that the L2 cache in disabled in the BIOS, in which case you'll have to enable it. The other possibility is that the program you're using reports the cache status incorrectly. To verify this, press the [Pause] key when your system's hardware information is displayed. This information appears as a table just after you've switched on your PC, and just before Windows starts. You'll need to be a little quick, or you'll miss the screen. Look at this table, and you'll be able to view the correct system information.



	A	B	C
1	Processor	Speeds	Cache
2			
3	Celeron	300.00 MHz, 266.00 MHz	N/A
4	Celeron	2.80 GHz, 2.70 GHz, 2.60 GHz, 2.50 GHz, 2.40 GHz, 2.30 GHz, 2.20 GHz, 2.10 GHz, 2.00 GHz, 1.80 GHz, 1.70 GHz, 1.10 GHz, 1.00 GHz, 900.00 MHz, 800.00 MHz, 733.00 MHz, 700.00 MHz, 667.00 MHz, 633.00 MHz, 600.00 MHz, 566.00 MHz, 533.00 MHz, 500.00 MHz, 466.00 MHz, 433.00 MHz, 400.00 MHz, 366.00 MHz, 333.00 MHz, 300.00 MHz	128 KB
5	Celeron	1.40 GHz, 1.30 GHz, 1.20 GHz, 1.10 GHz, 1.00 GHz	256 KB
6	Pentium III	1.40 GHz, 1.33 GHz, 1.20 GHz, 1.13 GHz, 1.10 GHz, 1.00 GHz, 933.00 MHz, 900.00 MHz, 866.00 Hz, 850.00 MHz, 800.00 MHz, 750.00 MHz, 733.00 MHz, 700.00 MHz, 667.00 MHz, 650.00 MHz, 600.00 MHz, 533.00 MHz, 533.00 MHz, 500.00 MHz	256 KB
7	Pentium III	1.40 GHz, 1.26 GHz, 1.13 GHz, 1.00 GHz, 933.00 MHz, 800.00 MHz, 600.00 MHz, 533.00 MHz, 800.00 MHz, 733.00 MHz, 800.00 MHz, 400.00 MHz	512 KB
8	Pentium III	1.60 GHz, 1.80 GHz, 1.60 GHz, 1.50 GHz, 1.40 GHz, 1.30 GHz	0 KB
9	Pentium IV	2.00 GHz, 1.90 GHz, 1.80 GHz, 1.70 GHz, 1.60 GHz, 1.50 GHz, 1.40 GHz, 1.30 GHz	256 KB
10	Pentium IV	3.20 GHz, 3.06 GHz, 3 GHz, 2.80 GHz, 2.66 GHz, 2.60 GHz, 2.53 GHz, 2.50 GHz, 2.40 GHz, 2.26 GHz, 2.20 GHz, 2.00 GHz, 1.80 GHz, 1.60 GHz	512 KB
11	Pentium IV	3.40E GHz, 3.20E GHz, 3E GHz, 2.80E GHz	1 MB
12	Source: http://processorfinder.intel.com/scripts/list.asp		
13			

This chart shows the different combinations of processor and cache that are available

Unhandled Exception while installing

Q. I have a Pentium III 450 MHz computer with Windows 98 SE. The problem is that recently, I tried to install the demo version of *Clive Barker's Undying*. The installer for the game comes with the Install Shield Wizard—the newer one, with the soft-blue icon. The installer showed that it was reading the packages. Then, a box popped up showing that setup was preparing the Install shield wizard, along with the progress bar. Everything was fine until this point. Then, a message box popped up saying, "Unhandled Exception". The exact error message said: "Error number: 0x80070725 Description: Incompatible version of the RPC stub Setup will now terminate".

Another interesting fact is that this now happens for every installer that uses Install Shield. I've installed the game before, and It ran fine then. Also, the disks I installed from were clean, so the error is not with the source.

I updated my drivers, and reinstalled DirectX9. There was no change. The one →

thing I could not do, is use an older backup of the registry, as I'd just taken the backup that very day. I tried it out though, but it didn't help.

Kaisar

A This error is caused by an incompatible version of a DLL that was installed on the system, such as Oleaut32.dll, Olepro32.dll, Asycfilt.dll, or Stdole2.tlb. For example, version 3.50 of Oleaut32.dll is installed and used only by Windows XP. So, you get this error if it is installed on a machine running any other operating system.

There are three fixes you can try. Choose the appropriate for your computer:

If you have Microsoft Office or an Office 2000 component installed, install the Office 2000 Service Release 1. You can use this solution for any operating system.

If you do not have Office 2000 or an Office 2000 component installed, download and install the mcrepair.exe tool from ***http://download.microsoft.com /download/msninvestor/patch/1.0/win98/en-us/mcrepair.exe***. When it prompts you to overwrite newer files, make sure you click 'Yes' for each file. You can use this solution for any operating system.

If you're using Windows 98 or 95, the error is due to a bad version of oleaut32.dll. To correct this problem, follow these directions to remove the old file and reinstall it. First, download the file appropriate to your operating system to your desktop, but do not execute it. The download locations are:

For Windows 98: ***http://support.installshield.com/ kb/files/Q108188/dcom98.exe***

For Windows 95: ***http://support.installshield.com/ kb/files/Q108188/dcom95.exe***

Now go to ***Start > Shutdown > Restart in MS-DOS mode***. At the command prompt, enter the following commands on separate lines as shown:

```
CD c:\windows\system
rename oleaut32.dll oleaut32.old
exit
```

Now Windows will restart. Ignore the error message: "A required .DLL file, C:\windows\system\oleaut32.dll, was not found." Double-click the file you downloaded to your Desktop earlier. Click Yes at the dialog that opens. The dcom.exe file installs a new oleaut32.dll file. After DCOM has been installed, restart the system.

If this procedure results in your PC getting even worse, simply go back to the MS-DOS prompt, and rename the oleaut32.old file back to oleaut32.dll.

You're mistaken, mister

User discipline

Q I have five PCs running Windows 2000 Professional connected over a LAN. I created user accounts with group membership as Guests so as to prevent users from installing software without my permission, though they should be able to download software, MP3s, video, etc. However, users can still install software at will. I run a cyber café, and it's really difficult to spy on each and every person who walks in.

Hari

Illustrations: Mahesh Benkar

A If your file system is NTFS, then the simplest way about it is to provide write permission for the entire C: drive to the administrator only. Right-click the C: drive, select Security, and here remove all groups with the exception of the Administrators group. Check the 'Inherent to sub-folders' checkbox, and press OK to set the new permission. Now, the guest user won't be able to install any software. Next, create a common folder wherein users can download software. This folder should have read and write permissions for all, and can be on the C: drive or any other partition. Alternatively, you can get the users to download software onto a floppy disk.

Q You gave the Linux version of *DOOM* in the previous CD, but I'm new to Linux, and don't know how to install it on Red Hat Linux 9.0.

Hira Nand Prasad

A The version of *DOOM* supplied on the CD in the February issue is neither for Windows nor for Linux. It's for a Mobile, i.e., the Symbian Platform. It's a Java-based application; you need to attach the mobile phone to the computer, and transfer the application to the mobile, in order to use it. But this version is meant only for the Symbian platform, so you'll be able to use it only if you have a mobile running the Symbian OS.

I need a service centre

Q I stay near Charni Road, Mumbai. Could you please recommend a good service centre or technician who won't insist on me signing a yearly contract to make home visits?

My system is three years old, and it's been showing the wrong time for the past two months. I believe this problem can be solved by replacing the CMOS battery. But according to my vendor—my system is assembled—this is a crystal oscillator problem. Is that true? Can a motherboard fault cause the wrong time to show up in the system tray?

I've not signed a yearly contract with my vendor, so he won't send a technician for inspection of the fault.

Ashar Bhavesh

A Firstly, sorry: We can't recommend any company or individuals to you. But regarding the CMOS battery, you can boot your machine without the CMOS battery. The only difference would be that the machine will generate a CMOS checksum error, and you would have to press ***[F1]*** each time you restart. Also, if CMOS battery is at fault, it will not be able retain the changes made to the time.

Replacing the battery is not difficult. Open the cabinet, locate the old battery, remove it, and insert the new one. A CMOS battery costs around Rs 20. If the problem is not rectified after replacing the battery, then it might be due to the oscillator, in which case you'll have to take the motherboard to a service centre.

Windows Explorer keeps crashing

Q. My Windows Explorer keeps crashing whenever I do a search, or use Explorer for a long time. I'm running Windows XP + SP1. To zero in on the problem, I monitored Task Manager to see the cause of crash, and disabled all startup programs, including antivirus software. I found a program, Dr. Watson, which starts immediately and causes Explorer to freeze, and then it crashes, and closes all Explorer windows, including Windows Explorer. I'm really frustrated. I tried searching the Microsoft XP online database for a patch, but none was available. What's the solution?

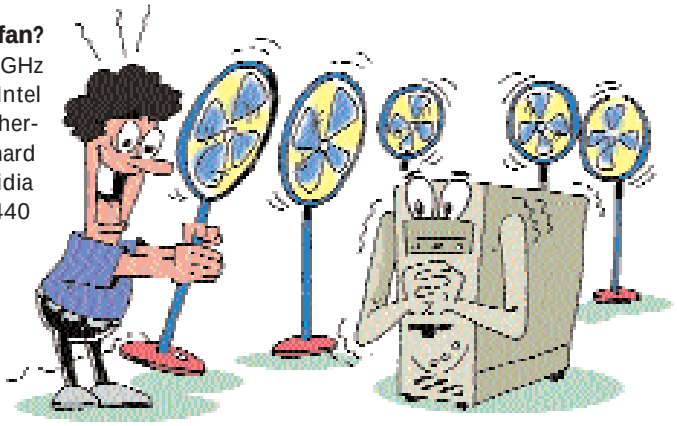
Shankar

A It's not necessarily Dr. Watson that's causing the problem. When an error is reported, Windows starts Dr. Watson, which creates a log file. This log file comprises the current state of the machine. This file can then be sent to the Microsoft technical support for help. Alternatively, you can configure Dr. Watson to create a crash dump file, a binary file that can be analysed with the help of a debugger.

By default, the log file created by Dr. Watson is named Drwtsn32.log, and is saved in the ***C:\Documents and Settings\All Users. WINNT\Application Data\Microsoft\Dr Watson*** folder.

Check the log file for the program that's causing the error. If it's Windows Explorer that's causing the problem,the fastest fix is to re-install Windows.

Fan in another fan?



Q. I have a 1.5 GHz CPU with an Intel 845GBV motherboard, a 40 GB hard disk, an nVidia GeForce4 MX 440 graphics card and a Creative Sound Blaster Live DE 5.1 sound card. Can I use another fan for the graphics card instead of its own fan? If so, what kind of fan should I use? Will it enhance my card's performance?

Udayan

A The fan that comes with the card is more than enough! You need not change or add any more fans to it. However, you can increase the number of fans in the cabinet, as it might improve the cooling system, and thereby increase the lifespan of the component. Make sure you have a better fan to keep things cool in case you wish to overclock your graphics card for better performance.

Help on the Internet

Q. My first question is whether it's possible to download attached e-mail files directly from the server—Hotmail or Sify—using FTP commands from within Windows, using the e-mail ID and password, without using a browser?

Second, is it possible to use a 40 GB hard disk on a 486 system? If yes, how?

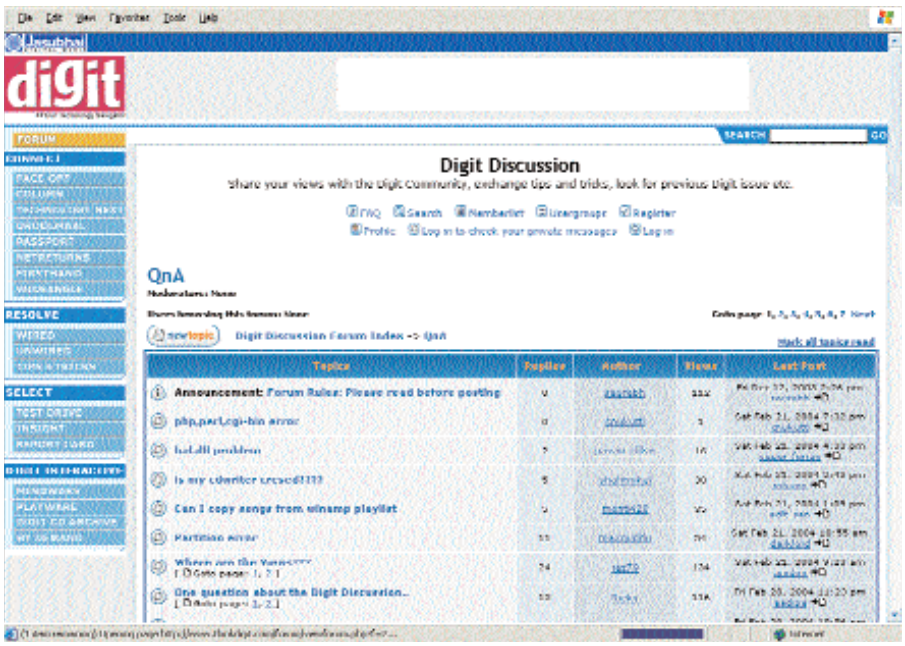
Lastly, is there a Web site I can go to, for suggestions on these matters?

Manoranjana Mohapatra

A For your first question, if you mean downloading attachments from e-mails in your Hotmail or Sify mailbox, then you can't. You can download attachments only after logging in via the usual interface. You can, however, download your Hotmail e-mails directly using e-mail clients such as Outlook Express or Outlook.

Now for your second query: Yes, you can, with the help of utilities you can find on the hard disk vendor's Web site. For a Seagate hard disk, go to ***www.seagate.com/support/disc/drivers/***, and for Samsung drives, go to ***www.samsung.com/Products/HardDiskDrive/utilities/index.htm***.

To answer your last question: We have a forum at ***http://www.thinkdigit.com/forum/viewforum.php?f=2*** to discuss such issues. You are more than welcome to join us.



*At **http://www.thinkdigit.com/forum/viewforum.php?f=2** you will find the QNA section where you can discuss your problems*

Firm wary

Q. I have three questions: What is a firmware update, and what does it do? Which of the following needs regular driver and firmware updates for optimal functionality: Motherboard, chipset, graphics card, sound card, hard disk,

FAQs

Read carefully

Q. My CD-ROM drive is driving me nuts. It reads every software CD as an audio CD. How do I put some sense into it?
Yudhveer Singh

A Such drives can be so irritating! The problem lies with the CD-ROM lens that is functioning erratically. Clean the CD-ROM lens using a lens-cleaner disc. Get it serviced at the nearest repair centre if the problem persists.

Boot out the choice

Q. I have Windows XP Professional loaded on my C: drive. Some time back, I installed Windows 98SE on the D: drive. This gave me a dual boot option. However, recently I formatted the D: drive and created a new partition after removing all traces of Windows 98SE. In spite of that, I still get a dual-boot screen asking me to choose between Windows XP and Windows 98. How do I get rid of that?
Tehseen Ali

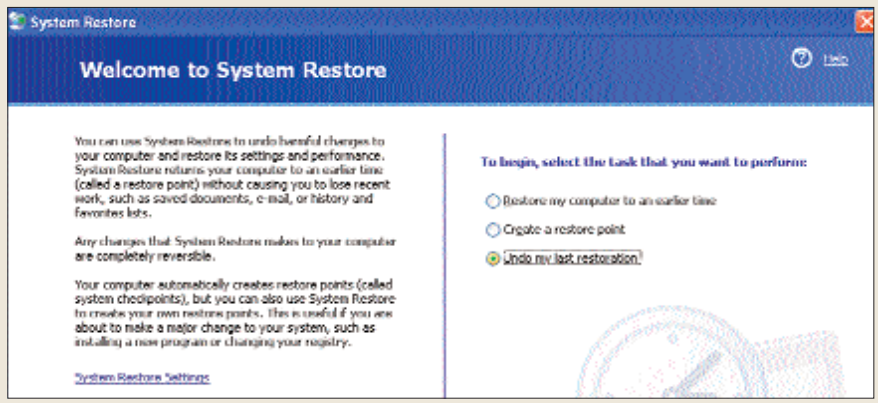
A Open the boot.ini file using Notepad, delete the following line: C:\="windows 98" and then save the file. The option will not appear the next time you boot your PC.

Restoring data

Q. I am using Windows XP Professional on a Pentium 4 system. Recently, my display and sound drivers were acting nasty. Hence, I reinstalled them, but to no avail. I then restored the system to an earlier time, and lost valuable software that I installed after the restoration point. There was no point available for the restoration when I tried to undo the changes. I don't have the CDs of the aforementioned software, so I can't reinstall them either. Is there any way to get back that software?
Shailesh

A Whenever you restore the system to an earlier point, Windows XP creates a restore point, and then proceeds with the restore. To undo the change, go to ***Accessibility > System Tools > System Restore*** and select 'Undo my last restoration'. If the restore point is not present then you might have disabled the system restore functionality. If so, then, pal, you have our condolences! You won't be able to go back to the said state.

Try using recovery software such as R-Fat, but it's doubtful whether you will ever retrieve the files since recovery is possible only until the physical location where the files are stored remains unused.



As the name suggests, 'Undo my last restoration' helps you recover data that is lost due to a prior restoration

processor, modem, monitor, or the TV tuner card?

Lastly, I intend buying a PC, primarily to play games. Which OS should I opt for—Windows XP Professional or Windows XP Home Edition?
Akhil Bahri

A Firmware is software that's embedded in the hardware. It's accessible through specially written applications that can write or read from the ROM chip, where the firmware resides. For instance, the BIOS on the motherboard is the firmware. As and when manufacturers discover bugs in the hardware, they put up specific updates to overcome them. Firmware updates can also help overcoming hardware limitations.

Assume that your current AMD board supports a 166 FSB processor. Later, if AMD releases a 200 FSB CPU, then the motherboard manufacturer may release a firmware update so that your board also supports it. In the case of such cards as TV-tuners, the manufacturer may release an update to support a new motherboard. Motherboards often require firmware updates for supporting newer features and hardware.

Finally, load Windows XP Home on your PC if gaming is your main need. It shores up to the needs of most games and is easy on the pocket too.

Dreadfully blue

Q. I have an Intel Pentium 4 1.7 GHz with a VIA P4M266-8233 motherboard, an S-Media GFX 5200 128 MB DDR graphics card, a 40 GB hard disk with dual operating systems—Windows 98 and Windows XP—and 256 MB SDRAM. I get the following blue-screen error message when uninstalling Realtek AC '97 for VIA audio drivers in Windows 98 to update them: "A fatal error has occurred at 0028:ff066a7b in vxd portcls(05) + 00003afb, the current application will be terminated." What do I do?
Neelonjon Goon

A Looks like driver corruption is at play here. Here's what you do: Hold down the Windows key and [Pause] to access the Properties of My Computer. Flip over to the Device Manager. Here, right-click Sound, select Properties and choose Update drivers. If this does not even allow you to overwrite the newer drivers, then restart your PC, go to the BIOS, disable Sound and then uninstall the old drivers. Restart again, enable sound in the BIOS and then reinstall the drivers.

sos@jasubhai.com
E-mail us your computing problems, and we may answer them here! Since we get more mails per day than we can handle, it may take some time for your query to be answered. Rest assured, we are listening!

tips & tricks

Atul Deshmukh

To be a Writer...

For those smitten by the writing bug, but facing the writer's block, we'll make a writer of you yet...

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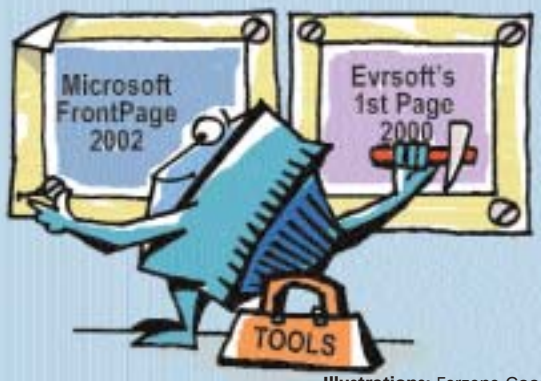
contents

WEB TOOLKITS

Your own Web site is one of the best ways to display your art. These site creation tools will help you bring forth your creativity online...



Illustrations: Farzana Cooper

1st Page 2000

1st Page 2000 ***(www.evrsoft.com)*** is a simple HTML editor with loads of features to help you create some dramatic Web sites with little effort.

Working around

The coding workspace comprises tabbed windows. By default, the Edit window is displayed, followed by the Preview and Reference panes. Click on the Reference pane to access a copy of several HTML guides, including the W3C HTML Reference.

Moding around

1st Page 2000 lets you access various modes, depending on your familiarity with the software. You are in the Easy or Normal mode, by default, when you start off for the first time. The page will show you large icons and simple controls, with all the advanced features within the respective menus. Once you are familiar with the tools at hand, you can go to Options and switch to the Advanced or Expert mode.

Quick work

To access simple spell-checking, press ***[F7]*** for all textual content; use LiveSpell ***(Tools > LiveSpell)*** to mark out incorrectly spelled text; use the thesaurus by pressing ***[Shift] + [F7]***.

Tagging

Find all assorted tag shortcuts for start, end, bold, italics, etc., under the Tag menu. Click to insert them into the HTML document. In the same menu, are the common font faces, font colours and font sizes.

Cleaning up

TidyHTML, a nifty customisable tool that comes with 1st Page, helps you clean and tidy up your HTML code of all its errors—go to ***Tools > TidyHTML Format and Fix***. Warnings are generated for any problems that TidyHTML cannot solve.

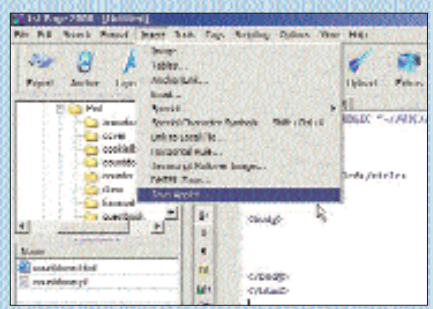
Quick and tidy

Use TidyHTML's quick-fix features ***(Tools > TidyHTML Quick Tools)*** to apply source-formatting, upgrade to a style sheet, or convert to XML or output tags in uppercase.

Use TidyHTML's powerful features to clean up your HTML code

Insert

The Insert menu eases the task of adding material onto the page. Whether it's adding an anchor to another Web page or another service, an e-mail link, images, tables or Java applets, etc, you can do it all. For instance, should you want to add in a table to the page, click on ***Insert > Tables...***, and key in the formatting as desired.



Use the Insert menu's numerous options to insert lots of little HTML code with ease

Perls of wisdom

1st Page 2000 comes with loads of features to jazz up your Web pages. Go to ***Scripting > Full Featured Perl Scripts***, and choose from countdown timers, credit card validators, etc. Your server should be running a CGI service, in case you wish to use the script.

JavaScript magic

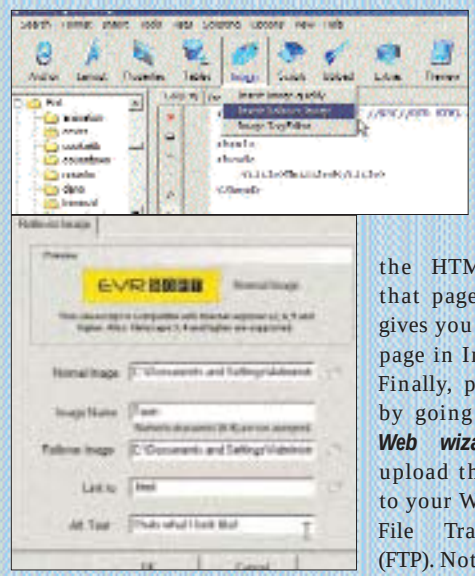
Go to ***Scripting > Instantz Scripts*** to access a list of JavaScripts, such as Audio Effects, Background Effects, Buttons, Calendars, Clocks, Menus, Passwords and so on; click on any of them to get further options. Choose the kind of effect you want to display, and click Insert. Selecting ***Scripts > Commonly Used JavaScript Wizard***

The Instanz JavaScript wizard has lots of easy-to-use JavaScripts

lets you access JavaScripts for several common applications such as drop-down menus, document fade effects, browser type and so on.

Rollover Images

One really cool effect you can add to your page is the rollover image effect. While in the Easy mode, click on the palette icon on the toolbar, and select Insert Rollover Image. In the applet that opens, specify the anchor and the ALT text to be inserted, and the image name as well. Click OK when you're done.



JavaScript for rollover images is now very easily inserted into your code

FrontPage 2002

FrontPage 2002 is Microsoft's standard HTML-editing and Web site creation tool that comes with Office 2002.

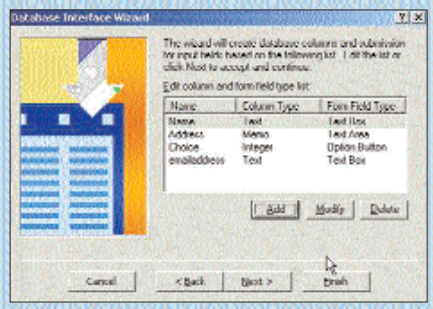
Creating your sites

FrontPage 2002 comes with a host of templates for all sorts of Web sites. Setting up a simple personal Web site is just a matter of minutes. Start FrontPage, go to ***File > New Page or Web***, and select Personal Web from the right-hand pane. Select Personal Web again and click OK. Thus, FrontPage creates a directory structure, as well as all the pages that you immediately need for your Web site.

You can edit the page content directly in the Normal pane. The HTML pane shows you all the HTML content for that page, while Preview gives you a preview of the page in Internet Explorer. Finally, publish the page by going to ***File > Publish Web wizard***. You may upload the pages directly to your Web site using the File Transfer Protocol (FTP). Note that you need a Web server with the Microsoft FrontPage 2000 Server Extensions turned on, or else the pages will not display accurately.

Creating database-driven sites

FrontPage 2002 lets you build nifty database-driven Web sites that work with your business even if you don't know how to work with databases, HTML, or ASP. Here's how you can, for example, capture e-mail addresses and phone numbers in a database. Go to ***File > New Page or Web***. In the right-hand pane, select Database Interface Wizard and click OK. Choose 'Create a new Access database within your web'. Click Next, and set a name for the database connection. Specify the names and types (whether string, numbers, etc.), of the database fields in the next screen. Click on Next, and the database is created. In the next screen, specify the pages you want created; by default a submission page and a results page are already selected. Finally, click Next and then Finish. Upload the database and the pages to a Web server that supports Active Server Pages (ASP), ActiveX Data Objects, Microsoft FrontPage 2000 Server Extensions or SharePoint team Services.



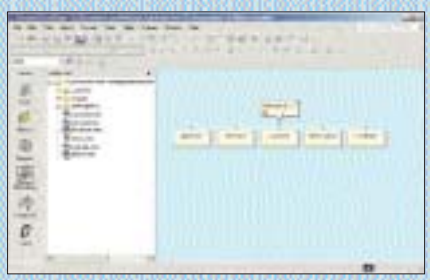
FrontPage 2002's menu-based interface sets up database and front-end HTML in a jiffy

Creating all sorts

FrontPage also lets you create Web sites that provide a corporate façade, or Web-based customer support. Go to ***File > New Page or Web***, and choose Web site Templates from the right-hand pane. This opens up the Templates applet for you to make a choice.

Views

You can employ FrontPage to inspect your Web pages too. Use the Views panel on the left-hand side of FrontPage to see various parameters on your Web site. For instance, clicking on Page lets you see the entire page in the workspace; Folders shows the folder structure; Reports builds up a site summary that details various Web site parameters such as pictures, unlinked and linked pages, broken hyperlinks, etc. Navigation shows you see a tree-like layout of the entire Web site, where you can add, delete or link in more pages. Hyperlinks shows you hyperlinks or anchors for each page in the folder list. Finally, Tasks shows you any listed tasks for the Web site.



The Views menu lets you inspect and change your whole site schema

Add in tasks from ***Edit > Tasks > Add Tasks...*** Use the Tasks view to track these.

Page options

Fine-tune compatibility options for your HTML projects so that they are accessed, either by several browsers, or a specific one. You can even host them on Apache or Microsoft IIS Web servers. Go to ***Tools > Page Options***. Flip over to the Compatibility tab, and select the browsers that you want to provide access to. Likewise, choose the appropriate version of the browser you're targetting. Servers lets you choose between Apache and IIS. For example, select Microsoft IIS for pages that are dynamically generated with ASP. Be sure to check the 'Microsoft FrontPage Server Extensions' checkbox for projects that need it. You can also select the appropriate settings from the remaining, such as ActiveX controls, VBScript, JavaScript, ASP, the CSS version, etc.

Set the custom page options from the Page Options applet

BLOGGING

Blogging is a neat way to get your work online, as well as a channel to communicate with other people of similar interests. Let's look at two popular Weblogs—Live Journal and Blogger

Live Journal

Live Journal ***(www.livejournal.com)*** is an excellent Web site to start your blogging odyssey. It lets you set up a simple blog with images. Registration is very straightforward. After logging in, go to Journal and choose Update... This opens the Update page, where you can key in your thoughts, adventures, experiences, etc., into the text field. Additional options let you put in access levels to make posts public, private or accessible only to friends. You can also disallow comments. You can define pictures you want to use, as well as click the Pictures link to add new pictures. Finally, click on Update Journal to load the entry onto the blog.

Live Journal lets you interact with a vast community of bloggers

Customisation

Live Journal allows for limited customisation within the page. Click ***Manage > Customize***. Here, the settings let you choose between S1, the old system and S2, the new system.

S2 lets you customise your blog's layout, and even has a style system language called S2

S1

S1 lets you customise your blog page layout using the Page Layout Style that has a number of listed styles. Layout customisation is possible with recent events and views. Also, set colour theme options here. A cool feature is Style Override that lets you tweak specific things about your page layout. These are valid at the beginning of a document, and are limited to <title>, <base>, <style>, <link>, and <meta>. Finally, change the look and feel of your Mood icons and save the changes.

S2

The layout customisation in the S2 system lets you change language and themes. Choose to blog in English, six other languages, or opt for a customised language. Finally, click Customize, under Individual settings, to set colour, font, presentation and text options. Even more detailed presentation styles are possible with their style system language, also known as S2.

Adding friends

You can add friends who will be able to access specific sections of your blog that are

The Friends tool lets you read your friend's posts, and lets them read all yours

not available to the general public. You can also view their posts on the Friends page. Friends have to be Live Journal users. Go to ***Manage > Friends*** to edit, add and filter friends. Finally, click on Save Changes and access the updated Friends page there.

Set the FTP details to blog directly to your personal Web space

Blogger

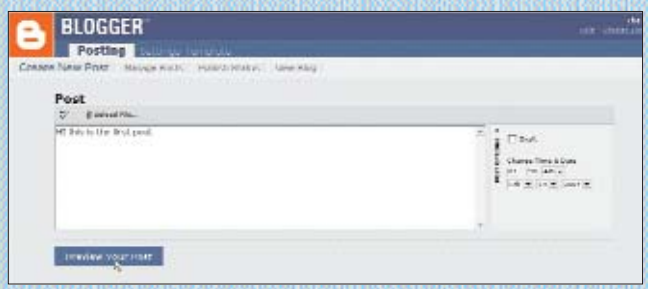
Blogger ***(www.blogger.com)*** is another popular blog spot. It has now tied up with Google. Posting is simple—all you need to do is click on your blog name. Blogger immediately puts you at the posting page, where you can add new posts by clicking on Create New Post. Once done, click on Publish Your Post.

Getting personal

If you have Web space, you can create your blog page, using Blogger's editing and publishing tools. You need to supply the FTP authentication details (username and password), and create the appropriate directory on your Web server. Choose to 'FTP it to your own server' while setting up your blog, and provide the necessary details. Now you can add in all posts at Blogger.com, and view them on your Web site!

Settings, and more

Clicking on Settings lets you access a lot of things about the way your blog works. Under Basic, you can change titles and the description of your blog. Publishing lets you set all your publishing details; Formatting sets time, date, language, etc.; Site Feed lets you link RSS feeds to your blog; E-mail lets you specify other e-mail addresses to route comments to, and Members lets you add in team members who can also blog on the same page—the best way to set up a community blog.



Blogger is one of the most popular blog spots

ConTemplating

You can change templates, from ***Templates > Blog Template*** and tweak the HTML code a bit. Choose New Template lets you select from a list of existing templates.

ACCESSIBILITY

"The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."

So said Tim Berners-Lee, W3C Director and inventor of the World Wide Web, and this aspect can be put into practice with a little effort. Once you have put together your Web site, use these tips to ensure that your pages are accessible to all.

Images

For those who do not use graphical browsers, or cannot access graphics in a browser, a simple accessibility tip is to use the ALT attribute and describe the image.

Detailed description

With HTML 4.0, you can now choose to put in full-picture descriptions along with the ALT text. Use the LONGDESC attribute to add this description. It can also take the form of a separate page referenced by a d (descriptive) link.

Quick images

Use the width and height attributes for every IMG tag to specify the dimension of an image. This speeds up image loading, and the text around the images starts to fill in rapidly. Here's their syntax:

<IMG SRC="coolcar.gif" height="200" width="200" ALT="My concept car" LONGDESC="car_detail.html" ALIGN=left>

Flashing Java

For all your efforts to make a classy Web site with Flash effects, it's possible that someone may be accessing it with a browser sans a Flash player. Hence, keep an alternative link that lets people bypass such effects. It is unreasonable to expect people to download an extra plug-in just to view the information on your Web site, especially when they can find the same elsewhere.

Keep the same in mind while opting for Flash menus. While the eye-candy is pleasing, with slow Internet access, people would prefer to have a no-fuss access to information. The same argument goes for using Java applets on your Web site. It's possible that Net-surfers may not have the Java Runtime Environment (JRE) installed. Downloading it from the Internet takes quite a while. Hence, keep a non-Java version too, and display a visible link to it.

Frames

Frames may make your Web pages look organised and neat, but they can be quite a hassle for those using a browser that does not support them. Hence, keep a link to a version of your Web site *sans* frames. This ensures access to all, regardless of frame compatibility.

Here's what you can do. After '</FRAMESET>', write ***'<NOFRAMES></NOFRAMES>'***, and include the HTML code that you would want to display in a frame-disabled browser within these two tags.

Here's a site with reasonable frames, which allow for easy navigation through the site

Testing

Testing each page on all the possible browsers makes a lot of sense, as if your pages are not in strict conformance of the W3C standards, then your complex pages appear differently in different browsers. Ensure that your HTML toolkit has several popular browsers, namely, Opera, Netscape and Mozilla. Also, consider testing the page with the Lynx text browser.

Checking and validating

It doesn't take too much effort to have your Web pages tested and validated. With little effort, you can use freely available services and tools over the Internet that will validate your Web pages and Web sites.

W3C's check

The W3C Web site ***(www.w3c.org)*** offers you free HTML and Cascading Style Sheets (CSS) validation services. Access the free HTML validation service at ***http://validator.w3.org/.*** It checks and ensures that your HTML code follows the W3C's Web Content Accessibility Guidelines (WCAG). Either submit the URL, or upload an HTML file for inspection. Access the tweakable features for this service by clicking on 'Extended Interface' or 'Extended File Upload Interface' on the home page. Alternatively, gain access to them at ***http://validator.w3.org/detailed.html*** for a submitted URL, or ***http://validator.w3.org/file-upload.html*** for an uploaded file. W3C's service depends on Document Type Definition (DTD) to validate the code. Lack of a proper DTD would lead to non-validation of the page.

W3C's site offers a free validation check. Just enter the URL to get the page validated

Validating the page CSS

Visit the W3C CSS validation service (***http://jigsaw.w3.org/css-validator/***), and choose to either validate by giving the URL of the CSS, or uploading

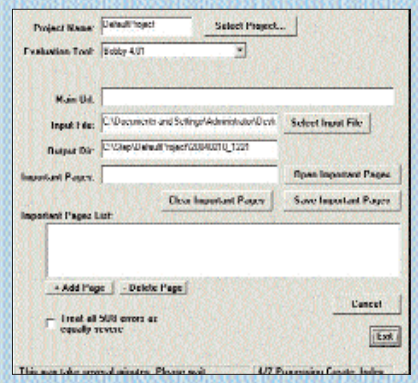
Standards of Access

The various accessibility standards ensure that the Internet and the World Wide Web is accessible to all, irrespective of the surfer's mode of access or disabilities. There are two well-known standards and guidelines of accessibility. The first is the World Wide Web Consortium (W3C) standard called the Web Content Accessibility Guidelines (WCAG), under their Web Accessibility Initiative ***(http://www.w3.org/WAI/).*** These guidelines have three levels of specification that provide various priority levels. The other is the US Government's Section 508 guidelines ***(www.section508.gov)***, which look at a relatively lesser level of accessibility guidelines, concentrating mostly on basic accessibility, whilst leaving out many other pressing issues. Both services offer free accessibility testing services and tools.

Bobby is a free service that tests Web sites for ease of use, adherence to standards and accessibility by people with disabilities. Display their endearing mascot on your Web site once it's Bobby-tested successfully.

Get this mascot to grace your Web site once you pass the Bobby test

it. You can also enter the code of the CSS within the text scan area. There is also a stand-alone tool available at the Web site for the same purpose.



Use STEP to make more accessible Web pages

Bobby

Bobby (***http://bobby.watchfire.com/bobby/html/en/index.jsp***) is a free service that validates and tests your Web site, and ensures compliance with accessibility guidelines. Bobby checks for W3C's WCAG guidelines, as well as the U.S. government's Section 508 guidelines. Enter the URL of the page, and choose to test it for Section 508 compliance, or for the WCAG compliance. Use the Customisation page (***http://bobby.watchfire.com/bobby/html/en/advanced.jsp***) to tweak Bobby for better results.

Bobby offers check services for both, the W3C guidelines, as well as the Section508 guidelines

Section 508

The US Government's Section 508 guidelines require all data in electronic format to be accessible to people with disabilities. At their Web site, (***www.section508.gov***), find a free tool called STEP508 (Simple Tool for Error Prioritisation) that looks at the severity of accessibility errors as well as the effort to fix them.

Customizing Bobby

In the advanced features, select checkboxes for full text output, complete HTML source for the lines, as well as the Analyze HTTP error pages option. Finally, for pages that respond differently to different browsers, Bobby impersonates a Netscape, IE, Opera, or Lynx browser, as well as AOL and WebTV.

RESOURCES

If you are ready to host your Web site and publish your work online, check out the following tips on free and paid hosting, and make it look absolutely professional

Domain-ing it

With domain names available for as low as US$ 9.95 (approx. Rs 448), it's easy to get yourself one from Web sites such as Network Solutions ***(www.networksolutions .com)***. In fact, you can also visit Web sites such as GoDaddy (***www.godaddy. com***) that has special economical offers for domain-name buyers. Once you register your domain, you can use free DNS services such as ZoneEdit (***www.zoneedit.com***) that lets you specify several sub-domains. Finally, you need space on a Web server. While most free services give you decent space, your Web site would be listed under their domain, and you will have to suffer their ad banners on your Web pages. Host your Web site using space bought from an ISP to use your domain name.

GeoCities

With GeoCities (***www.geocities.com***) now a part of Yahoo!, signing up for an account is as simple as using the one existing with Yahoo!. GeoCities gives you 15 MB of space. Set up your Web site using their free Web site creation tools such as the Yahoo! PageWizards and the Yahoo! PageBuilder.

The PageWizard is a simple five-minute page set-up wizard that lets you select a page from the available page themes, and then customise the text, images and links and personal information. The PageBuilder wizard is a little more detailed in its customization. You will need JRE

Set up your GeoCities site in a jiffy, and experiment with the available styles

installed to access it though. Also, the PageBuilder takes a while to open if you are using a dial-up connection. For more customised pages, you can create your own page, then upload the pages and the associated files into your GeoCities account. Upload files that size up to 5 MB by clicking on Easy Upload in the Advanced Toolbox section of your GeoCities account.

Getting free space

Several Web sites offer free space to host your Web site. Most of them have a decent amount of space. They also come with basic Web site building tools and wizards to guide you through such services.

FreeServers

FreeServers (***www.freeservers.com***) is yet another place where you can access Web space for free. The basic account provides you 12 MB space, with an upper file-size limit of 256 KB. FreeServers also gives out free Web-hosting space for any of your domain names. For that though, the page will have its ad banners.

Brinkster

The basic free account at Brinkster (***www.brinkster.com***) entitles you to a maximum of 30 MB space. Brinkster lets you run ASP pages that interface with an online database; the FrontPage Server Extensions though are available only for the paid account. The file size restriction here is 1 MB (larger for databases). Use their browser-based file manager to upload files; FTP is restricted to the paid account.

Brinkster is free, has a clean interface, but limited features

150m

Huge is definitely what you call 150m.com's (***www.150m.com***) offer of 100 MB free space—restricted to a maximum of 1 MB for individual file sizes. 150m allows for FTP access to your space on their site. It also lets you redirect your domain names to the pages that you have put up here. Finally, 150m.com itself has a simple Web site creation tool and additional tweaks for your pages.

Space, more space

For those of you who would like still more space, check out O-F.com (***www. o-f.com***). The free basic free account gives you 100 MB of space, 150m.com style. You are limited to a daily bandwidth of 40 MB. The user manager interface is very similar to that of 150m.com, so if you have been looking for lots of space, try this free web space service as well. Apart from a site builder tool, there's a plus point for using this service—their free FTP services, just like 150m.com. This way, when it comes to uploads, you are not restricted to some browser based file manager. Again, for all the extras such as FrontPage Extensions, you would need to be a paid account user.

Templates

Web sites

Web site templates are a great way to start working with, since they come complete with images and interlinked pages. Start with MyFreeTemplates (***www.myfreetemplates.com***) that hosts a variety of templates for personal as well as business Web sites.

Newsletters

Now that you have your Web site up and running, it makes sense to let the whole world know, and what better way than a newsletter? Get free newsletter templates at MyFreeTemplates (***www.myfreetemplates.com***), and start working on despatching them. Of course, e-mail etiquette demands that you give people the option of receiving them, and not spam mercilessly.

MyFreeTemplates gives you an easy way of making classy looking sites

Gothic II

RPG at its best

Flashback to *Gothic*: You find yourself thrown into a penal colony, sequestered from the rest of civilisation by a magical barrier—you can get into the colony, but you can't get out. After several joyous hours of playing the game, you discover that the secret to getting the barrier down lies with a creature called The Sleeper. By the end of *Gothic*, you have slain The Sleeper, and in the process, gotten yourself trapped in the rubble of its temple. The Sleeper, before being vanquished, called out to like-minded creatures to rally against the good folks of the land. The fall of the barrier actually boosted the Orcs, allowing them to spread all over the mining prison colony, cutting off the supply of precious ore. To make matters worse, the farmers are revolting against the king, and refuse to sell their harvest at a low price .

Despair echoes everywhere. The world's in quick need of a miracle, and this is your cue. The solution seems to lie in an ancient and sacred artefact called the Eye of Innos. Innos is the God of light and fire, and a brother to Beliar, the bad guy.

Since your former home is besieged by Orcs and Dragons, you'll find refuge in the harbour city of Khorinis. Three main guilds are sprinkled around within the city—the Militia, Mercenaries, and the Monastery. The Militia are in service to the king, and are in the city on a secret mission. The Mercenaries guild was formed by the former convicts of the new camp at the Penal Colony—they're out and out fighters. In the Monastery, you're taught about Innos and the Magic Circle of Fire by the Fire Mages—the priests of Innos. But you'll need to join one of these guilds and progress in their ranks first. To join a guild, you need to become a citizen of Khorinis, and this is done by working with any of the masters as an apprentice: There is a hunter, an alchemist and a weaponsmith from which to choose.

Not a very intellectual conversation..

The land of Khorinis is home to some very interesting characters—the pompous Fire Mages, the do-good Paladins and the cutthroat band of Mercenaries. Any of them will help you get to your goal, but only for their vested interests. The land is huge and filled with lush forests, deep valleys complete with waterfalls, and a ship-wrecked treasure island. Access to various areas has been restricted in an obtuse manner. Some areas are guarded by monsters that you can't challenge until you gain enough experience—or, you find a way around them, or a trick to defeat them.

The game looks a lot better than its predecessor. The forests are covered with lush bushes, and rays of sunshine peek through the dense canopy of trees. Take a swim in the ocean, and you'll be greeted by lashing waves that froth at the shore. For the kind of hardware requirements the game demands, it looks very good.

The controls might be a bit frustrating at first. Although this sequel has better mouse support, it is designed only for keyboard play. With time, the controls become second nature, and you'll come to appreciate the simplicity of it all. Combat is divided into two-handed and single-handed. You have to time both—your attack, and block—in order to win battles.

The most obvious flaw is the translation from German to English. While not completely bug-free, most bugs only look bad and don't interfere with the gameplay. One irritating flaw is if you press the wrong key at the wrong time during a conversation, the game gets stuck in a particular camera angle—until you restart.

If you really want to enjoy the game, play it at an easy pace. It can be rushed through, but you'll miss a lot. Take it slow; enjoy the beautifully created world and the characters that call it home. All the dialogues in the game are spoken, so there's little chance of you ever getting bored reading page after page of text. There are some good moments in the game, some funny, some emotional, some nostalgic. If you're a RPG fan and are dying to play a good game, this is it. Good RPGs are few and far in between, so don't miss this opportunity.

Uh-oh. Better get out of here while I still have my legs

Genre: RPG ■ **Developer:** Piranha Bytes ■ **Publisher:** Atari ■ **System Requirements:** 700 MHz CPU, 256 MB RAM, 32 MB video card, 2.2 GB hard disk space ■ **Price:** US$ 39.90 ■ **Web site:** www.gothic2.com
Rating: ★★★★½

Vietcong

Tour of duty

Vietcong is the story of a platoon stationed right near enemy lines while the war between North and South Vietnam was in full swing. If you're a fan of classic rock, buy this game just for the sound track—the game kicks off with you in a chopper and *Hey Joe* by Jimi Hendrix in the background. The game has good graphics, excellent sound and very partial AI. The enemy AI will outsmart you at every turn, while your team can't seem to find its way around a rock.

And we shall ride into battle on our steeds... - The new face of the US cavalry

Weapons are beautifully and faithfully rendered. A nice touch is the wound placement—if you shoot someone in the arm, his arm, and not his chest, gets bloodied. Voice acting is impeccable and weapons are full sounding—not tinny and off like in some games. Ambient sounds, as you wander through the jungle, are really fantastic. Birds flapping, monkeys screeching, numerous frogs in a swamp; they're all there. Another neat aspect of the game is that natives speak to you in authentic Vietnamese. There are no English subtitles. Your only hope is to find someone who speaks both languages.

Vietcong is one of the most carefully crafted and intricate games on any platform. The amount of history incorporated into this game, and the amount of minute details draw you into believing that you're actually a soldier in Vietnam. There's even a Quick Fight mode, which you can play through various multi-player style levels against some good AI. In the end there is a real sense of accomplishment in beating *Vietcong*; even on the easiest settings, this game will still test your skills.

Genre: Action ■ **Developer:** Pterodon ■ **Publisher:** Gathering ■ **System requirements:** 700 MHz CPU, 256 MB RAM, 1.8 GB hard disk space, 32 MB video card, DirectX 8.1 ■ **Price:** US$ 29.99 ■ **Web site:** www.vietcong-game.com
Rating: ★★★★½

Tony Hawk's Pro Skater 4

Break all barriers

The major change in *Tony Hawk's Pro Skater 4*, as compared to earlier versions, is the time constraint to the missions. In earlier versions, missions were available at the onset of a level, and had to be completed in a given time. This time around, you can freely skate the environs and have fun; until you trigger a mission, and a timer starts ticking. Missions are handed out by skaters or bystanders. These can range from rescues and challenges, to races. Irrespective of whether you succeed or fail a mission, the game continues and you're free to retry, hunt for other challenges or just skate around without a care in the world.

A little help is always welcome

You can complete these missions, which get difficult incrementally, to earn cash and pro points. Cash can be used to unlock several features in the game, and pro points are used to unlock professional challenges. Vehicles can now be used to Grind, Wallride and perform the familiar Car Plant. What makes them really useful is the ability to hitch a ride by holding onto the rear bumper—seen in several skateboarding movies, and is called 'Skitchin' in skater lingo.

The game has certain enhancements in the sound department too. It includes a couple of great tracks-Iron Maiden's *Number of the Beast* and AC/DC's *TNT*. The soundtrack now comes with a playlist, which can be used to switch on or off certain tracks and also set the sequence in which they'll play. Iron Maiden's famous band mascot Eddie (Metal Head) is featured as one of the secret skaters! Those who're going try this series for the first time, be prepared to be hooked!

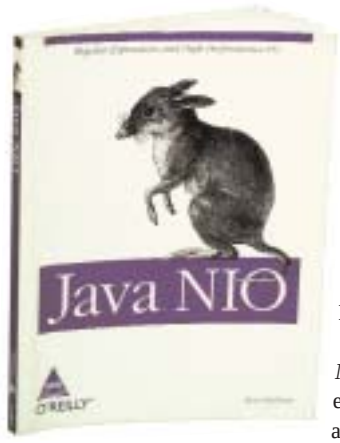
Genre: Simulation ■ **Developer:** Neversoft Entertainment ■ **Publisher:** Activision ■ **System requirements:** 800 MHz CPU, 256 MB RAM, DirectX 8.1, 32 MB GeForce2 or Radeon graphics card, 700 MB hard disk space ■ **Price:** NA ■ **Web site:** http://www.aspyr.com/games.php/pc/thps4
Rating: ★★★★½

Java NIO

It's interesting to NIO

The book starts with a rather bland opening line: "Let's talk I/O. No, no come back. It's not really all that dull." Come back, shouldn't we? As a Java programmer, you cannot really be blamed for putting I/O concerns on the backburner. After all, JVMs make programmers fret on extracting every ounce of CPU performance they could manage, thus relegating I/O optimization to neglect. However, with time, JVMs have evolved enough to run bytecodes at speeds approaching native code such as C/C++. This means that the classic case of I/O being the major performance bottleneck is now truer for Java than ever. And here, Java's I/O classes haven't been of much help.

This is where the New I/O (NIO) framework of Java comes into picture. NIO classes enable you to pack Java applications with efficient I/O routines for large buffers, non-contiguous read-writes, channels, memory-mapped files, etc. Ron Hitchen's *Java NIO* gives you a comprehensive coverage of the topic. The book makes for an interesting and fruitful read.



It can be roughly divided into four sections: Chapters one to four introduce and elaborate the I/O concepts, namely, buffers, channels and selectors. Chapter five deals with Java regular expressions Application Programming Interface (API). Chapter six talks about charsets, another mystery for programmers deploying software over multiple architectures. The book also packs in appendices on NIO and Java Native Interface (JNI), selectable channel Shared Programming Interface (SPI), and an NIO quick API reference.

The book uses very focused code examples to illustrate core topics, as well as asides such as file holes. Diagrams are intuitive and simple. Another nice feature is simple Unified Modeling Language (UML) class diagrams that give you a quick overview of various classes in the NIO framework.

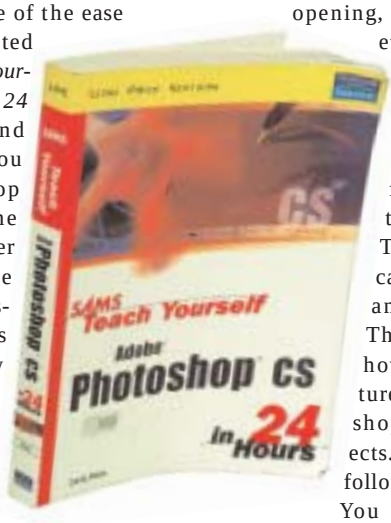
The final word—*Java NIO* is highly recommended to intermediate and advanced Java developers who want to keep abreast with the latest without going through voluminous tomes.

Publisher: Shroff Publishers and Distributors Pvt Ltd ■ **Authors:** Ron Hitchens ■ **Phone:** 022-27634290 ■ **Fax:** 022-27683375 ■ **E-mail:** spd@vsnl.com ■ **Web site:** www.oreilly.com ■ **Price:** Rs 275
Rating: ★★★★☆

SAMS Teach Yourself Adobe Photoshop CS in 24 Hours

The clock is ticking…

The *SAMS Teach Yourself* series of books is widely popular because of the ease with which they get you started on the subject. *SAMS Teach Yourself Adobe Photoshop CS in 24 Hours* treads the same path, and is good enough at making you understand what Photoshop CS does. Photoshop CS is the latest version of the premier product from Adobe—the sweetheart of graphic professionals across the world. This book was one of the first few written on Photoshop CS. In fact, it was written on the beta version of the product.



This 500-pages book is divided into seven sections. The first deals with basics such as opening, saving, selections, etc. The second segment talks about layers, masks and paths, the third about filters and the fourth talks about text and plug-ins. The fifth part takes care of photo-repair and enhancements. The sixth shows you how to print your pictures and use Photoshop CS for Web projects. A useful appendix follows at the end.

You can download the images used in the book from the publisher's Web site. This makes learning easier, as you can try out things explained on the same photographs. However, all the screenshots are taken on a Mac PC. Windows users might not be able to relate what they see in the book, and what they find on their monitor screen.

Another good aspect is the exercises given at the end of the book. Trying out these ensures faster learning. Though this book is in black and white, there are 16 coloured, high quality pages with some screenshots of what Photoshop CS can do. To sum up, here is a decent book if you don't know much about Photoshop, and want an overview of its features.

Publisher: Pearson Education (Singapore) Pvt Ltd ■ **Author:** Carla Rose ■ **Distributor:** Pearson Education India ■ **Phone:** 011-2146067 ■ **E-mail:** info@pearsoned.co.in ■ **Web site:** www.samspublishing.com ■ **Price:** Rs 350
Rating: ★★★★☆

Testing Mischief

Monkey business at its best at the DIgit Test Centre

The folks at the Digit Test Centre are usually a quiet lot—they sit in their large quadrangle-type room, where they tinker with motherboards, RAM chips and monitors with the same delight of a kindergarten kid playing with crayons.

But imagine the delight of the Test Centre folks when they asked several consumer electronics and IT hardware companies to send in their entertainment products for testing. While comparing their glee to giggly schoolgirls discussing their latest plaything would be inappropriate, their excitement was nothing less than what NASA scientists experience soon after they see Mars Rover spacecraft.

Nevertheless, once the products arrived—7.1 speaker systems, a Media Center PC, DVD players, an Internet radio, a 5.1 headphone set, a LCD TV, and TV tuner cards - these guys got back to their work with the seriousness of an Andrew Wiles trying to solve Fermat's Last Theorem.

Mahesh Benkar

... Or so it seemed

Mysteriously, they never came out to talk to people, or lunch with them, or even play table tennis—Digit's favourite pastime whenever they are stressed or want to escape the boss. Strangely enough, some sounds began to emanate from the usually pin-drop-silence TC zone. And boy, were they sounds or what!

A U2 Live Concert DVD on a seven-channel speaker system was by far the most popular entertainment option. But not once did they ever say to us: "Wish you were here." And since they were huddled around the speakers for most part of the day (and sometimes well into the night), the others felt the TC should change its anthem to *Goodbye, blue sky*, Pink Floyd's most evocative anti-war song.

But surely, the TC was indeed like a war zone, with most Digit team members trying a get piece of the entertainment pie. One person wanted to watch Tom Cruise's *Minority Report*, while others wanted the other Tom—the one who goes around with the Hanks surname— in his Oscar-winning *Forrest Gump*.

Those with a quiet demeanour settled for the 5.1 surround headphones with three jacks. One for the rear effect, one for the front, and one for the centre speaker. Even the traditionally-ignored stereo headphones were in demand.

In between, the bigger audiophiles among the group would switch on DVD audio, making music listening truly divine.

The story does not end here. There were other interesting products being tested this month—such as the Handspring Treo 180 and the Nokia 6600, a camera phone that can surprise the most hardened cynics with its features. Deepak Dhingra, who heads the Test Centre, and who grew a natty French beard to complement his 'newly-acquired 6600', went around clicking candid photos that even our in-house professional cameraperson Mexy Xavier would be proud of.

Another phone, the flip-model BenQ, was with Sachin Kalbag, who styles himself as this magazine's features editor. As a full-fledged, card-carrying member of the Boys With Toys club, Sachin even played a prank on his wife telling her he bought a Rs 10k phone just for the heck of it. She promptly threatened to not speak to him for an unspecified period. Thankfully, the said period was just 10 hours.

Meanwhile assistant editor, Sumod Hajela, went around flaunting the Handspring Treo 180 for a day or two, until he found out that Handspring has actually discontinued the model in the US, but a few importers have been bringing the model to India only recently. He would then strategically hide it, determined to now flaunt a Treo only if the model number was 600, a current favourite in the US.

The month of February was an eventful one for most people at the Test Centre, thanks to the consumer electronics and IT entertainment products bonanza. We already hear that the engineers in there have put in a requisition for 72-inch home theatre systems. Wait till they get *that*!

What is the temperature on the surface of the sun?

a. 5,50,000 degrees Celsius
b. 5,500 degrees Celsius
c. 550 degrees Celsius
d. 55,00,00,000 degrees Celsius

2 **Which is the brightest star, apart from the sun, visible to the naked eye?**
a. Sirius
b. Rigel
c. Vega
d. Procyon

3 **After the sun, which star is closest to us?**
a. Alpha Centauri
b. Sirius
c. Proxima Centauri
d. Rigel

4 **One is called Spirit; what is the other NASA Mars rover called?**
a. Apollo
b. Columbia
c. Opportunity
d. Lunakhod

5 **Galileo, NASA's probe, was launched in 1989, and spent 14 years charting Jupiter and its moons. It was pulled down in Sept 2003, due to lack of fuel propellant. How far did it travel?**
a. 24 million Km
b. 3.14159 billion Km
c. 0.07 light years
d. 4.6 billion Km

6 **Which Indian cosmonaut was the backup for Rakesh Sharma on the Soyuz T-11 trip into space?**
a. Bahadur Shah
b. Rakesh Haryani
c. Rakesh Malhotra
d. Ravish Malhotra

7 **The first human was sent into space on April 12, 1961. Who was it?**
a. Neil Armstrong
b. Valentina Tereshkova
c. Rakesh Sharma
d. Yuri Gagarin

8 **Which rocket launched all the Apollo missions? It is one of the most powerful rockets ever built.**
a. Saturn V
b. Jupiter II
c. Apollo 17
d. CAC-1

9 **Who was the first, and only, Chinese astronaut?**
a. Ai Chin Liu
b. Yang Liwei
c. Jackie Chan
d. Taikonaut

10 **Name the spacecraft launched by China in October 2003.**
a. Ananova
b. Yuhangyuan
c. Dragon Space
d. Shenzhou V

11 **What was the last Apollo mission?**
a. Apollo 23
b. Apollo 17
c. Apollo 27
d. Apollo 15

12 **What does the name of the Russian space station, Mir, which was brought down in 2001, mean?**
a. Peace **b.** Unity
c. Freedom **d.** Water

Answers

Quiz

1: b 2: a
3: c 4: c
5: d 6: d
7: d 8: a
9: d 10: d
11: b 12: a

Crossword

Across: 2. Xmen, 6. Terminator, 7. Star Wars, 8. Hackers.
Down: 1. Antitrust, 3. Matrix, 4. Startrek, 5. War games

did you know

...that a teaspoon of neutron star material weighs about 110 million tons?

numberette

A typical nova explosion releases about as much energy as the Sun emits in **10,000** years, or as much as in **1,00,00,00,00,0 0,00,00,00,00, 000** nuclear bombs

digit QUOTIENT

1 to 5 Way to go...
6 to 10 Good, if you like being mediocre
11 to 15 Your next job could be with us!

Got an interesting question? Send it in with the correct answer to quiz@thinkdigit.com

This month's theme: Movies

Across
2. Based on comic, a team fights for a world which hates them
6. I'll be back
7. The battle for Princess Leia
8. Popularly known in their circle as Hax0rs

Down
1. Bill Gates recruits a person to write software to interconnect all multimedia devices on planet
3. "You are the one!"
4. Starring Captain Jean Luc-Picard
5. It's fun to control that nuclear missile with my home PC.