

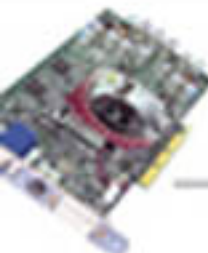


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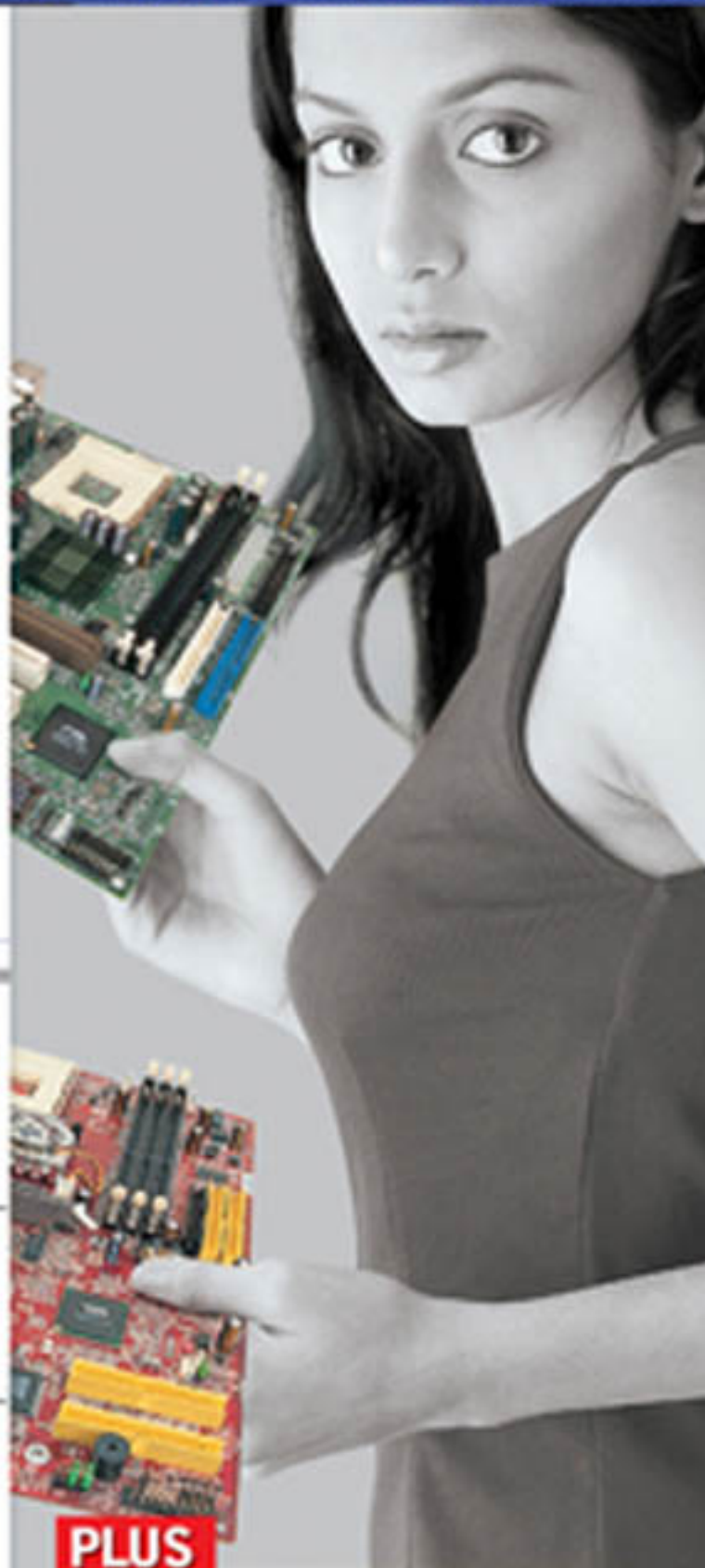
>> Your Technology Navigator

The BIGGEST-EVER TEST in India

Motherboards

Choose from among **47** modelsNet Telephony is here
Cheaper Conversations-Legally!Share resources
across two PCs!Quark 5.0 vs
Design 2.0Exclusive!
nVidia's GeForce4

Get ready for FREE Gaming!

**PLUS**Add fun to your DESKTOP
Buying a Secondhand PC
Hands Free Computing

Faster!

We've come a long way from the days of dial-up modems, frequent disconnects and pathetic Internet speeds to always-on, high speed connections where you can watch movies and play online games.

You're joking right?

Obviously. The promise of broadband in India still remains unrealised. Sure, if you've got the money, you can invest in expensive dedicated leased lines, VSATs and the like for your office or home and experience gut-wrenching speeds. There are more affordable alternatives: DSL and Cable Internet, both great technologies that can fulfil the promise of broadband.

But, they don't. These same technologies have let us down. Or to be more precise their service providers and implementers have let us down.

Early networks supported customers who used bandwidth in the range of 2-4 Kbps. This has changed. An average broadband customer today demands a minimum of 1 Mbps. So when service providers with older networks try to scale up to match the high requirements, reliability and performance issues creep in.

It's the classic chicken and the egg conundrum. Should the service providers ramp up infrastructure for users that don't exist yet? Or should they wait and get more users before they ramp up their infrastructure, which leads to poor quality of Service for the existing users.

The egg has hatched and the chicken is nowhere in sight. Users want high speed Internet access and are ready to pay for it. Especially considering the dial-up fees they pay to the telecom companies and their local Internet provider in any case.

So are we going to be stuck to our modems forever?

No. A solution is in sight. With the lowering costs of international bandwidth and the setting up of national high-speed backbones, the costs of upgrading infrastructure will become more feasible. But it's going to take some time.

Meanwhile the only 'real solution provider' is that one entity which currently controls all last mile connectivity—your local *cablewallah*. India has a very large cable TV penetration—it's much more than the telephone user base. The *cablewallah* is responsible for wiring our nation, so to speak, and with his lower operational costs and bundles of ingenuity, he's in just the right position to offer broadband to the starving consumer, neighbourhood by neighbourhood.

All that's left is for you to demand this service.



vinit_aggarwal@jasubhai.com



Vinit Aggarwal
Assistant Editor

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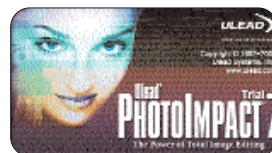
mindware



SOFTWARE

Ulead PhotoImpact 7

The ideal image editing software for working with digital photographs, creative design or Web graphics. Easy-to-use tools allow you to edit photographs like a pro.



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Give your PC the look you've always wanted with software like BackFlip v5.0, WinLogo Changer 1.2, GraFX Saver Pro 3.6 and much more

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Test Drive

■ Reviews of 8 select motherboards tested by us

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■ Bring the music back into your life with these music sites

Tips & Tricks

■ 10 of the best tips on boosting your PC's performance

playware



ARENA

Freedom Force

Lead your own team of superheroes against crazed villains with dirt on their minds and tricks up their sleeves in this tactical RPG that bristles with over-the-top action of comic books



Extras

Quake III Rally v1.0, True Matrix Mod for Max Payne, and more



SURGE

Music

Groove to the tunes of some of the most happening games ever such as *Duke Nukem* and *Monkey Island*

Trailers

Resident Evil, *Star Wars: Attack of the Clones*, *Spider-man*

GALLERY

Dig into a treasure chest of wallpapers, screensavers, themes and Winamp skins

DROOLMAAL

Good looks and functionality, all in one place!

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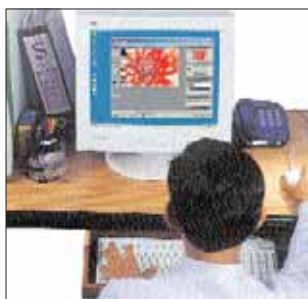
Drool of the month

www.thinkdigit.com



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

Web Special



Remote control your PC

This workshop will show you how you can operate your office PC from the comfort of your home.

Workshop

Learning the art of computing

For newbies and tech veterans alike, our workshops will help you come to grips with some of the basic—and at times not so obvious—features of computing.

Test Drive

Product Watch



From comparison tests to individual product reviews, we've got it all. Our reviews spell out the pros and cons of each product to help you make an informed buying decision.

Web Special



Send SMS from your desktop

You don't need a mobile phone to bombard your friends with messages. Learn to send SMS from your PC itself.

VOLUME 2, ISSUE 5

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DIGIT MAY 2002

hypothesis

MPEG-4

■ What is it?

A wide range of audio and video technologies designed to heavily compress streams of video, only with an interesting twist.

■ What does it do?

It allows video and audio to function just like a Web page, giving you the chance to interact with various elements of the picture in real-time. Imagine clicking on an actor's suit and finding all the details about it, like how much it costs and where to buy it.

■ What's the potential? MPEG-4 is catching up with developers and television broadcasters are lining up to cash in on the amazing possibilities of interactive video. With the interest it's garnering, MPEG-4 is set to become the most revolutionary compression standard yet.

snapshot

\$17.7 bn
was the worldwide
gaming software
revenues in 2001
Expected revenues
by 2004:
\$21.6 bn

Source: Datamonitor

Beach office

Have you dreamed about working while sitting on the beach with a cool drink by your side? Well, it's already happening at Telenor, a Norwegian telecom company.

Telenor's latest office at Oslo's former airport has what is claimed to be Europe's largest wireless network. The office happens to

be by the seaside of Fornebu—employees are found with laptops by the seaside in the evenings!

With this arrangement, workers are on the network no matter where they are in the company and are able to work efficiently. Telenor chose this system because of cramped office space—so cramped that they use a 40x40 centimetre cupboard for storage!

Telenor is also trying to sell this wireless zone concept to other companies. Could this be the beginning of the office of the future? Perhaps.



ILLUSTRATIONS: Prashant

Smart Dust

Imagine small modules the size of dust particles, which can act as sensors with communication capabilities. This is nanotechnology and it's nearer than you think.

The 'Smart Dust' has been developed by researchers of the University of California at Berkeley. These are basically self-sustaining network nodes with sizes of less than a millimetre each. They have in-built sensors and can communicate with other devices. This makes it possible for Smart Dust to be used in the field of distributed processing, health, security, etc, opening up endless technological possibilities.

Open source robots

The latest entrant in the robot scene is Open Pino, whose technical details are open source.

Open Pino (named after Pinocchio) is developed by Kitano Symbiotic Systems Project, which is funded by the Japanese government. The group has put the entire technical details (software as well as hardware) online. The source code of Pino is available under GPL (GNU Public License).

Priced at \$7,500 per kit, the Japanese claim that Pino sales have picked up since its online advertising started.

4G on the horizon

3G will take a lot more time to become commonplace. But NTT DoCoMo has already started work on a fourth generation (4G) network. NTT has major plans for 4G and it is expected to be around 260 times faster than 3G. This translates into downlink speeds of up to 100 Mbps and uplink speeds of 20 Mbps.

The most attractive feature of these handsets is

high-definition video—they will have pictures with double the resolution of normal television. Prototypes using this technology are slated to be released this summer and DoCoMo has plans of launching the network around 2010.

All this is happening despite the fact that DoCoMo's two-year-old 3G network is not yet in place properly and is currently only available in Tokyo.



A chip on your shoulder

Embedding chips in your body is not science fiction anymore.

Meet Jeff Jacob, who's getting a VeriChip embedded in his shoulder. He's in a critical state and requires medical attention throughout the day. The chip will actually help doctors attend to him if he has an emergency and is not able to speak. All that the doctor has to do is to read the chip using a spe-

cial scanner. In fact, his son and wife are also getting the



chip implanted in their bodies.

This chip made by Applied

Digital is about the size of a grain of rice and can be injected beneath the patient's skin. The chip stores the entire medical history of a patient. This is of tremendous help to doctors since they will have access to it even if the patient is unconscious or unable to speak.

These chips are not very expensive, and in the future might be coupled with GPS systems as well.

redalert

Bugged with 'MyLife'?

Dubbed 'MyLife', this worm propagates across mail servers with its payload sent across as an attachment.

After infection, MyLife erases system files that are essential for operation. To remove this threat, update your virus scanner and run a system-wide check. Once complete, you will have to delete those files that are listed as infected. Now you need to make manual changes in the system registry. Click **Start > Run** and type **regedit**, then press OK. Navigate to the following registry key: HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Run

In the right window pane, locate the following key and delete it: c:\windows\system\cari.scr

Maldal malady

'Maldal.E' uses Microsoft Outlook to mail itself to all the contacts in your address book. The worm arrives in an e-mail with a subject line—this is the computer name of the infected PC that sent the message.

When executed, the worm copies itself to the Windows\System directory as win.exe. To remove this virus update your virus scanner, and be sure to delete the worm's registry entry. Go to the Registry Editor and search for a key that reads:

HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Run\System = "%System%\win.exe"

Delete this entry, save the changes, exit, and reboot.

GeForce being scrapped

According to experts at *Xbitlabs.com*, the GeForce is dead! Yes, nVidia is planning to scrap the GeForce name altogether.

The NV30, nVidia's latest offering, will be using 3dfx technology. 3dfx was acquired by nVidia in early 2001. Now it seems that

nVidia is likely to use 3dfx's Rampage technology, which posed a threat to its new range of products. So we can expect the forthcoming nVidia products to have completely new architectures.

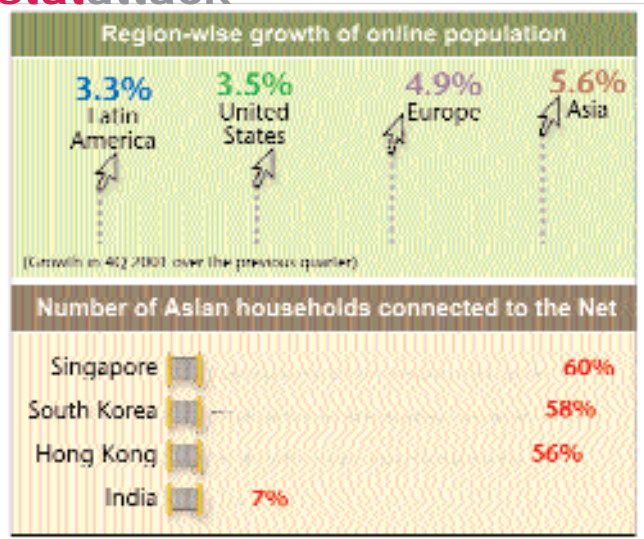
This is a path breaker as nVidia's new products are more or less modifications

to the previous product lines.

Wondering if this is a smart move? Well, 3dfx was the leader in graphics performance at one point of time. In fact, it had a cult-like status among gamers. If this happens, ATi had better pack up their bags!

statattack

INFOGRAPHICS: Jaya Shetty



Source: www.bizasia.com

snapshot

60% of Indians prefer using mobile phones and SMS to keep in touch
Growth in the number of Indian mobile subscribers between March 2001 and 2002 is **80%**

Source: www.newsbytes.com, www.zdnetindia.com

How ethical is monitoring?

Every worker has a right to protest against employers monitoring his/her e-mail and Internet use. Well, in the UK at least, if not in India.

UK's information commission has passed a draft, which makes monitoring of employee e-mail usage illegal. That ought to make many employees happy. After all, would you like it if someone

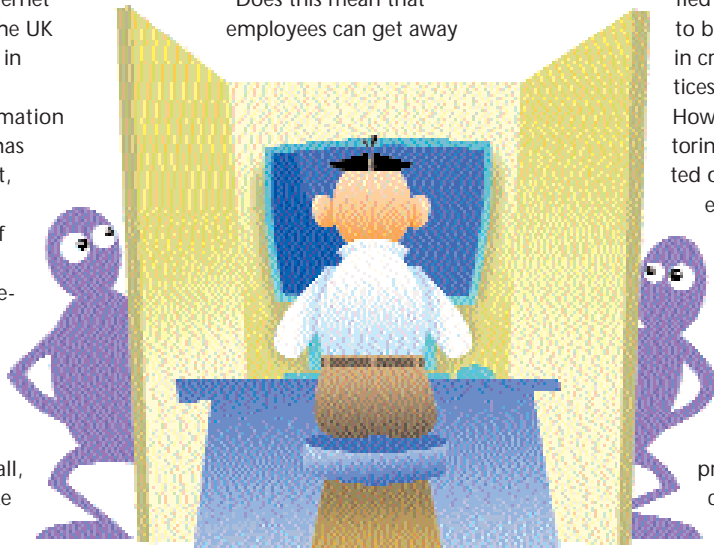
else read your snail mail letters before it reached you? Why should e-mail be different?

Does this mean that employees can get away

with anything? Not exactly. Monitoring of staff is permitted if the management has identi-

fied an employee to be indulging in criminal practices on the Net. However, monitoring is permitted only to gather evidence.

Although the draft has several loopholes, it is a welcome measure for most privacy advocates.



Move over, Graffiti and Transcribe

"You have a meeting scheduled with the boss at 10." No, that's not your secretary. That's your PDA speaking.

PDA manufacturers like HP and IBM are already working on speech for the PDA. These devices can recognise speech, translate it into other languages, and announce the translation. While they're at it, a talking PDA called Phraselator is already out there. And it's being used by US troops in Afghanistan!

Phraselator will actually translate commands and



phrases in English to Urdu. Its database has more than 1,000 phrases in different languages. It even uses specific tones for each kind of phrase. More phrases are being added to enhance its power.

Tux with MS Office

Linux lovers hate to admit this, but there are times when they miss MS Office. That's when software like CrossOver Office step in.

CodeWeavers has released a new software called CrossOver Office which lets you run MS Office and Lotus Notes on Linux. CrossOver Office does not need a Windows licence. Nor does it need emulators like WINE. Till now, one of the major problems faced when running Windows applications on Linux was the need to run emulators, which basically lead to applications being slower.

CrossOver Office is priced at approximately Rs 2,750 and is an attractive proposition for Office fans who have crossed over to Linux.

Fly DSL class

What would you give to surf on DSL

speeds while you are flying?

Well, Inmarsat's Swift64 will offer satellite bandwidth for aeroplanes to help passengers surf, send e-mail and even watch TV.

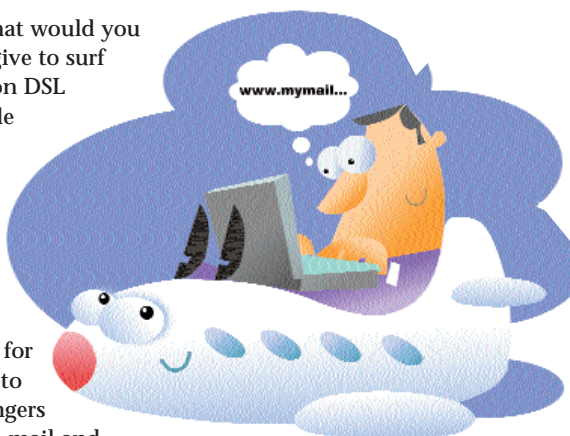
Swift64 offers data speeds of up to 64 kbps, same as that of a DSL connection. It will be available for corporate jet owners in June and for commercial airliners by the end of 2002.

The technology makes use of communications antennas that are already

using Inmarsat's services.

Passengers will connect their laptops to an onboard Internet server via an Internet jack available at each seat.

The Internet server will be using Inmarsat's communication antennas to transmit and receive data.



snapshot

The use of home PCs for surfing has dropped by almost **40%** (in the last four years) because people are surfing more at work

Source: www.ucsl.cc

■ Tetris goes pay-per-play in UK ■ Microsoft to officially support CD+RW standard ■ Groove's upcoming software seeks to revolutionise P2P

Die spammers!

Don't you hate seeing your inbox full of spam every morning? Junk mails that are mostly scams, and there's not a thing you can do about it. Not any more, if the American Federal Trade Commission (FTC) has its way.

The FTC has sued four Web-based scams like chain letter schemes to false cancer cures. They have also initiated legal action against 63 cases of Internet fraud in the last four months. Many of them have had to shut down operations. Looks like ordinary people are having their voice heard at last.

One of the saddest

victims of these scams is Peter Fulton who was fooled by a Web site selling cancer cures. These cures costing around \$2,400 to \$5,200 were claimed to cure cancer without surgery, chemotherapy or other such cancer treatments. Fulton's wife,

who was suffering from inoperable pancreatic cancer, passed away since the cures had no effect at all.

The site has been brought down, but the damage has been done. Here's hoping that FTC's actions will bring down spam on a whole.



heroes

Chameleon

A programmable microchip named after the camouflaging reptile is the next shift in handheld technology. With it, a handheld can change back and forth between a mobile phone, PDA, and a mobile entertainment device. Truly chameleonic!

Simulators

Australian education authorities are convinced that certain computer games, SimCity, for example, can be used as a learning tool for building strategic planning and team-building skills in young students. Schools in Australia's capital have already launched pilot projects at the primary level.

zeroes

PS2

A critical 8MB memory stick upgrade used to save games, particularly the lengthy RPG types, is in short supply. Irate customers caught unaware claim it's like getting the machine without a power cord.

Net Advertising

Web site owners are turning to downloadable software rather than pop-up advertising. Not only will this suck already skim bandwidth, but Net users are also complaining that some of these ads redirect them to adult content sites.

Learning from mothers

We are all proud of our moms, no matter how much they nag us. But Dan Baber from Michigan, USA apparently decided to go one step further. He started with trying to persuade people to

buy one day of his mom's attention. The offer was that his mom would e-mail the 'buyer' for one whole day.

He put her thoughts for sale as Item # 1527369622 on eBay titled "Best Mother in the World—Her Thoughts." His mom would e-mail or send a written response

about her thoughts on how she

brought up Dan and his sister. It has done surprisingly well since the bidding has reached \$610, even though the first bid was for \$1!

Well, it would seem that more people care about mother's advice than they actually admit.



KDE 3.0 is out

A new version of KDE, one of the better looking GUIs available for Linux, has been released. It



has better multimedia, e-mail and printing capabilities, support for 50 languages, and more.

Konqueror, the file manager-cum-Web browser, now has support for JavaScript, Java, XML 1.0, CSS, HTML 4, and SSL along with Flash and RealAudio support.

snapshot

64%

of online consumers distrust Web sites

Source: www.nua.com

■ Walter Hewlett's lawsuit upsets HP-Compaq merger plans ■ Microsoft gives up on Hailstorm, the set of software building blocks for its .NET service

Playing the suicide game

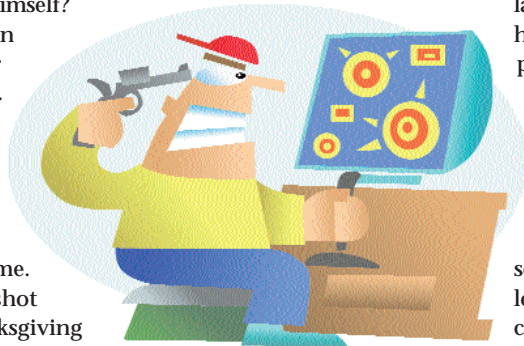
Sony's multiplayer online role playing game, EverQuest, is addictive. But is it addictive enough for someone to kill himself?

That's what Shawn Woolley's mother wants to find out.

Shawn was a major EverQuest addict who quit his job to play EverQuest full time. The 21-year old shot himself on Thanksgiving last year. Elizabeth Woolley, his mother, believes that his online gaming partners

might have clues as to what happened.

The problems arose when she approached Sony Online



Entertainment (SOE) for details. They refused to give

details citing customer privacy. This has led to Elizabeth suing Sony over Shawn's suicide. She wants Sony to put warning labels on the game. EverQuest has more than 400,000 people playing it online.

Blaming gaming alone for suicide is not an excuse. It's more important that parents monitor what their kids are doing online.

Besides that, correcting poor social skills and mental problems is also important. It's a combination of all these that drive a person towards suicide than just excessive online gaming.

quoteworthy

"I am a big believer in forcing change on large institutions for the sake of forcing change. The longer an organisation stays intact, the less successful it is."

— Louis Gerstner, Chairman and CEO, IBM Corp

"Intellectual property is at risk from rampant bootlegging, file sharing and CD burning."

— Pete Jones, CEO of BMG Distribution

"This is a combination that's good for Linux."

— Carly Fiorina on the HP-Compaq merger

Digital pens to replace keyboards

Think about entering data into a computer and the first thing to pop into your mind is a keyboard. An Israeli company plans to change that with their digital pen which is set to replace keyboards and mice. Virtual

pen or 'Vpen' from OTM Technologies allows mobile and PDA users to enter data, draw images, point and click, and play games. The Vpen is basically a stylus with a tiny optical laser reader. Although this concept has been around from the



1960s, it never really took off.

However, OTM has the advantage with Microsoft, Motorola, Siemens, and others supporting the technology. Motorola has already demonstrated its latest line of mobile phones which work with a wireless OTM pen. Microsoft also showed an iPaq linked to an OTM pen.

snapshot

\$39.7 bn was spent to acquire 1,289 Internet companies in 2001

Source: Webmergers

tomorrow's technology

Digitally discerning

With the current bandwidth situation in the country, here's a new development that's sure to tickle videoconferencing buffs to the bone. A new technology, recently developed by an Israeli start-up, 3DV Systems, has the potential to make Web-based video a

reality on slow dial-up lines. Their object extraction is a new technique that can discriminate objects in its field



of view and capture only what's required. It uses a laser to gauge depth of items and sends its readings to a computer. Their fellow countrymen at EnQuad Technologies employ a similar software solution.

The company has built an algorithm that can extract objects from a pre-recorded stream of video. It is similar to the Israeli technology in

that it can process the removal of undesired objects in real-time. According to the company's CEO, Eran Yarom, the technology can be stretched to accommodate other uses. A video feed of a cricket match can clearly capture the playing field, while sampling the outfield and the audience in a much lower resolution. Yarom claims the results are outstanding; a 75 per cent drop in bandwidth requirements. India, this one's for you!

■ Microsoft to focus on developing Office suite and IE for Mac ■ Banias to change Intel's mobile road map drastically ■

irthday plans

Dear Sir,
I was very surprised on seeing the April issue. You've always celebrated your birthday by giving away something special with your birthday issue. Why not this year? Although Digit did not turn four, you should celebrate four years of hard work!

Shishir
Bangalore



Dear Shishir,
April was not Digit's birthday. June will mark our first anniversary and you can rest assured that there are some exciting offers planned for this occasion. (Hint: Search this issue for the scoop on our Anniversary issue plans.)

Digit

ixing delays

Dear Digit,
I am a regular reader of Digit since the last two-and-a-half years and have always obtained my copy from the newsstand. However, for the last few months the magazine arrives by the 3rd or the 4th of the month. Why is this so? Earlier the magazine was always out by the 1st. Is this due to complaints from subscribers regarding the early availability of the magazine at the newsstand?

Ritesh Joshi,
Via e-mail

Dear Ritesh,
We're not playing favourites. All our readers—subscribers and newsstand buyers—are equally important to us. The magazine has been arriving later than usual due to delays at our end. We're aware of this problem and are working to fix this.

Digit

A sticky problem

Hi,
In your reply to Donald's letter about the list of CD contents (March 2002), you'd talked about the contents being listed on the back of the CD pouches. But these pouches are pasted on to the packaging cardboard in such a manner that when we pull them off a thin layer of paper is also torn off and hence a part of the printed matter is lost. This can be solved if the pasting is done at the edges of the pouches.

Ashok Sharma
Coimbatore

Dear Ashok,
That's an excellent suggestion! I've spoken to our production department about being more careful while pasting the CDs and they'll implement this, starting with this issue itself.

Digit

Missing the A-List

Hello Digit,
I am a subscriber of Digit and sorely miss the price list that was a regular feature in the previous issues. The A-List gave me the current prices for the best hardware and software products in the market. I don't understand why it has not been appearing since the last few months. I hope that it makes a comeback from the next issue.

Ramnan
Via e-mail

Dear Ramnan,
We've received a number of similar mails on the A-List, which was dropped from the magazine starting January 2002. We would love to hear from all our readers whether the A-List should be reinstated within the magazine. Visit www.thinkdigit.com and participate in our first online poll to decide the fate of the A-List.

Digit

thumbs down for Linux?

Dear Digit,
The last three issues of Digit have been Collector's Editions. You have truly changed for the better! The main reason is because of your shift away from topics like PDAs and Linux. Granted that they are here to stay, but from an Indian perspective, both of them are practically useless. Linux is the most cumbersome OS for every non-geek out there. Nothing beats the functionality of Windows, particularly XP, which simply blows the competition away. And we all know that Digit is not a 'for geeks only' magazine. I simply don't get the logic in using something that is so difficult to learn, all in the name of being independent of the Redmond giant.

Avinash Jayaprakash,
Thrissur, Kerala

Dear Avinash,
While we gladly accept your praise, there's been no change of heart from our side on Linux. In fact, the last three issues have featured some story or another on Linux. Sure it's not as simple to use as Windows, but in a country like ours, where most consumers equate software with being free (read pirated), a truly free operating system that can take on the might of the Redmond giant is a boon. By the way, do you have a licence for your copy of Windows XP?

Digit

Go graphics!

Hi,
I always wanted software that could help me in choosing the right PC and the April issue answered my prayers with its collection of benchmarking and diagnostic tools. But I was very disappointed that the graphics card test was dropped as I was eagerly looking forward to it. Please make sure you include it in your next issue.

Anuj Sahai
Via e-mail

Dear Anuj,
We had every intention of carrying the graphics card test in our April issue. However, the release of Nvidia's latest, fastest and baddest wonder card, the GeForce4, put us in a spot. Added to this was the fact that other notable cards like the Radeon 8500 have still not made an entry into the Indian market. After much soul searching we decided that it wouldn't be fair for us to do a comparison test without considering these stars of graphics technology.

Digit

Hunting for game

Dear Digit Team,
You should provide more gaming articles and should try to review the latest international games instead of featuring old ones like Tropico which was released almost a year ago.

Shoeb Khan
Via e-mail



Dear Shoeb,
Our Arcade section was introduced with just this intention of serving the needs of passionate gamers like you. Unfortunately computer games, like foreign movies take around two-four months to make their way to the Indian shores. This introduces a time lag between our reviews and their international release date. While we could talk about games before their actual release (like in our Sneak Peeks article in March), we think it's more useful to discuss those games that you can actually go out and buy. And you can always taste the latest games on our Playware CD.

digit

Net benefits

Hello!
I have a suggestion: can you provide us with free Internet hours every month? Sounds awkward but it will surely increase your popularity with your readers.

Via e-mail

digit

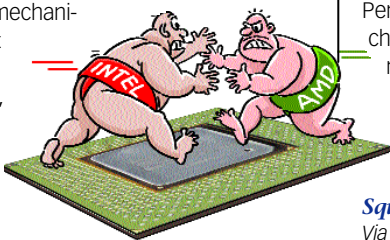
Dear Sherry,
Providing free Net access is very similar to movie trailers or demo software. You whet your audience's appetite just a little bit to make sure that they come back for the full movie or the commercial version of the software. ISPs carry out these sampling activities with the hope that some satisfied users might convert into paying customers. We've done similar exercises in the past with some ISPs and will continue to provide this whenever possible, but doing it month after month might not be feasible (for the ISPs at least).

Head2Head

And the Intel vs AMD debate continues...

Dear Sirs,
I just got hold of your April issue and I saw the letter from Nitin on AMD processors. The AMD Athlon/Duron processors are virtual time bombs in the sense that they do not have a cutover transistor, which automatically shuts off the CPU in the case of a heat overload (The P-III simply hangs). Also, the P4 continues working when the external fans are taken off (this was demonstrated by a popular hardware Web site) but the Athlon simply flames away. My take is that if a CPU is okay at the start, it will work properly for the rest of its life. But a fan has moving mechanical parts that can fail, and when it does, there will be fireworks.

Ajay Puri
Via e-mail



Dear Digit,
I've been a computer buff since 1995 when I assembled my first computer. It was an AMD 386. It worked at a measly 40 MHz but was all of 7 MHz faster than Intel's 33 MHz 386. Since then I have had an AMD K62 400 MHz and now I have an AMD Athlon 1.13 GHz. No regrets. My respect for AMD has only grown over time. Also, there's another angle to all of this: Intel prices its CPUs higher than AMD, which means that both Intel and the vendor make more money (assuming their manufacturing costs are similar). Therefore, Intel has more money to advertise and can create more noise about their Pentium CPUs. So AMD stands absolutely no chance of producing a chip that overheats and is not stable as every other factor is against them.

This is where frank magazines like Digit play a huge role.

PS: I do not keep my computer in an air-conditioned room.

Squadron Leader H.P. Kumar
Via e-mail

Short Bytes

Thank you

Dear Sir,
Thanks to Digit, I can actively participate in technical discussions with my friends who have a computer background even though I'm not a computer professional. Sometimes they even come to me for rectifying software/hardware problems.

Dr Jignesh Pandya

Agent 001 in the crossfire

Dear Karan,
This is in reference to Balachandrar's letter saying that Agent 001 is a complete waste of space (April 2002). I think that Agent 001 brings to light what an Indian consumer feels and can expect from the market. Don't stop Agent 001!

Sanjul Dhawan
Via e-mail

Goof Ups

■ In the monitor comparison test on page 54, Proview PA-566 15-inch monitor is shown with the 'Best Performance Award' logo. Instead, this monitor was the recipient of our 'Best Value Award' in the 15-inch category.

■ A lot of our readers have complained that the demo of Medal of Honor was corrupted and the installation would abort abruptly after some time. We've put a fresh (and working) demo on this month's Mindware CD.

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

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

MAGNETIC STORAGE: What Lies Ahead

The future promises hard disk drives with increased bit density and smaller form factors



S.B. Koo
General Manager, Asia Pacific Sales Group,
Storage System Division, Samsung Electronics

// It's not just about space any more—now it's all about how to get performance into the same price bracket //

If there's one system component that has seen dramatic and continuous change over the years, it's the storage subsystem. Ever since the debut of the first clunky 5 MB hard disk drives, the increase in the capacity and speed of these drives has been spiralling upwards. With the latest breed of hard disks incorporating cutting edge implementations in the fields of mechanics, electronics, chemical engineering, materials and even aerodynamics, hard disk drives are a good indicator of the state of today's technology.

Most people don't really give too much thought to a hard disk in the overall reckoning of which computer to buy—they generally go in for one that fits their budget without bothering with details such as the interface or the drive's spindle speed. However, these factors can make a world of difference, especially while working with applications such as image processing, sound and video editing and hardcore gaming.

This is becoming more pronounced with today's applications being more demanding on your computer's resources than was the case in the past. Everything from the operating system's boot-up time to the startup time taken by an application and virtual memory performance is directly affected by your hard disk's speed. Today's drives are considerably faster. With the newer 7,200-rpm hard disk drives, the overall system can operate in a smoother and faster fashion.

Another very pertinent issue is that of noise levels. At home or work, noise is a very important factor to consider—the continuous whirr of a hard disk drive can really spoil your movie-watching experience or disturb your concentration when you are trying to type those reports! Today's hard disks incorporate a range of enhancements in their construction and in the implementation of materials used, driving their noise level down to just above the threshold of human hearing.

Companies have also realised that as far as the average hard disk user is concerned, it's not just about capacity any more—most users do not even use the entire hard disk during the course of their computer's life. It's now all about how to get the maximum performance into the same price bracket that consumers are used to paying.

On the technology front, there have been a range of improvements along with new standards that have contributed to the superior performance and reliability of hard disk drives today. The most important among these is the increase in the 'areal density' or the number of bits that can be packed onto the surface of a hard disk's platter. The current standard is 40 GB per platter, which will increase to 60 GB per platter by the end of this year and further on to a whopping 80 GB per platter by the beginning of the next year.

This is going to allow much larger capacity hard disks to be fabricated using lesser number of platters and this consequently translates into lower prices for the end-user. With increasing bit density, there is also going to be a simultaneous improvement in the technology used in the drive's read-write heads (from 0.18 micron to 0.13 micron). Also on the board are new interfaces such as Serial ATA and USB 2.0—interfaces that promise performance while still being simple to configure and use.

The most important factor that indicates the direction of the hard disk industry is the application it's used for. All this while hard disks were used only in desktops or servers, but with the proliferation of 'lifestyle' products, you will now see an increasing number of hard disks used in non-PC applications—in devices such as digital cameras, MP3 players, set-top boxes, digital video recorders and gaming consoles.

Soon hard disk drives with smaller form factors that can be used in these applications will appear in increasing numbers—in the coming year, about 20 per cent of hard disks sold in the desktop category will be used for non-PC applications. This is indicative of a very significant trend in the use and the direction of magnetic storage in the years to come. ■

As told to Marco D'Souza

Big Byte

The computing highway is a 64-bit lane and your machine is powered by ClawHammer. Itanium takes the backseat. Ready?

For three decades (and counting), the speedy growth of the microprocessor has led to some electrifying breakthroughs in computing. With each evolutionary step forward, a single telling yardstick—power—gauges the progress of these electronic brains. With yet another evolutionary leap in the offing, PCs are set to undergo a change like no other. Computing power will speak of new dimensions to explore and exploit.

Undoubtedly, 64-bit has the power to steer us towards futuristic ideas, bringing them closer than we ever thought possible. For instance did you ever imagine 100 percent accurate voice recognition? But with recent developments, computers will not only hear you, they'll understand your every word, no matter how unique your speech. And it's not only the complex routines such as these that need boosts of processing power. The requirement starts from the lowest factor in the computing chain: the common user.

Without the power of 32-bit computing, the ease with which we use a PC

via operating systems such as Windows, could never have been possible. The next chapter in computing comes in the form of 64-bit computing. It's not only a lot more powerful than the existing 32-bit technology, but it also opens doors for turning today's obstacles into tomorrow's realities.

So what is 64-bit computing? It's certainly not something you can touch or see—it's something you can experience. It all begins beneath the hood, the heart of all computers, the CPU. Today's processors operate at 32-bit, giving them room to digest 32-bits of information at once. The oncoming 64-bit onslaught will obviously have twice the capacity. Think of it as a 32-lane highway doubling its width; it's a tremendous change in computing power!

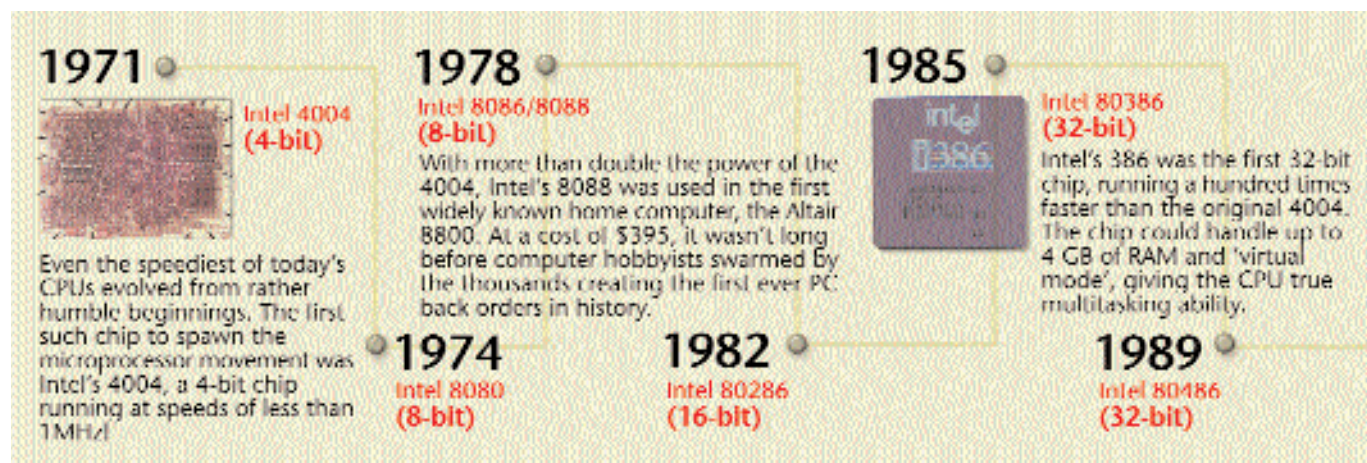
But in order to cash in on the promises of a brilliant future, we need the keys to unlock it. The first and most fundamental obstacle rearing itself in our paths is, what else, software support. There are other gaps too that make the transition from 32-bit to 64-bit not exactly a cakewalk. Essentially, 64-bit computing is a

delicate matter wherein the entire balance of the computing industry is at stake. At least this is no exaggeration!

Why all the hoopla?

The two biggest players in the CPU market, Intel and AMD, are battling it out with each other to reach one common goal. Who'll control the developing 64-bit computing market in the coming years?

Each of these companies desire to set a paradigm for the industry to follow. The score so far: Intel quietly made it out first with their Itanium chip, a high-end processor dedicated to server and enterprise level computing. Built from the ground up, Itanium is completely focussed on the 64-bit computing platform, a strategy that could possibly be the bane of its entire existence. By jumping the gun directly to a platform that has little support, Intel has shut out more than 93 percent of existing applications, resources and technology. This leaves users—like us in India—in a lurch. Sure, we can purchase a top-of-the-line chip, but without the right enabling tools, what could we possibly do with an Itanium? AMD, conscious of this,



has taken the initiative to fill in the gaps. Their argument is, rather than betting the farm on a technology too futuristic for the currently available tools, why not give users the opportunity to ramp up as and when the time is right?

AMD's endeavour is only months away from your desktop. Later this year, the company will introduce ClawHammer, a 64-bit desktop processor that carries along a 32-bit legacy. This is the first in a series of CPUs, codenamed Hammer, that follow the path to 64-bit horizons. And, unlike Itanium, the Hammer series will carry the bridge that links their processors with older, 32-bit applications.

architecture for the Itanium called IA-64, to address 64 bits and run 32-bit applications where necessary. Intel is also said to be working on its own version of 64-bit extensions for x86. In practical terms, AMD is primarily concerned with getting 64-bit applications and operating systems for servers ported over to SledgeHammer, its server CPU. ClawHammers on the other hand will most likely use the regular 32-bit software—64-bit applications won't come to desktops until around 2004.

Moving upwards

Making the move to a 64-bit platform sounds simpler than it actually is. But get-

necessarily mean that software support is going to be swift, or for that matter, even reliable. One must remember that 64-bit is not new technology. For years since the Alpha chip, this new frontier of computing has had to endure scanty OS and application support. On one hand, chipmakers have been slapping price premiums on high-end chips. Knowing fully well that deep market penetration of these chips is a distant dream, OS makers such as Microsoft have stayed away from pouring millions of dollars on R&D for something that is not likely to generate significant returns. But with two of the largest chipmakers ready to place all their

ClawHammer fills in the gaps that Itanium created between today's 32-bit apps and tomorrow's 64-bit technology

AMD's upcoming line up credits its foundations to a design called x86-64, giving it the ability to go both ways. This design works by adding several new instructions to the current x86 processor architecture. Doing this extends the chip architecture and it now becomes capable of addressing 64 bits of data. Currently, x86-based chips from both Intel and AMD address 32 bits of data. x86-64 allows AMD chips to support both.

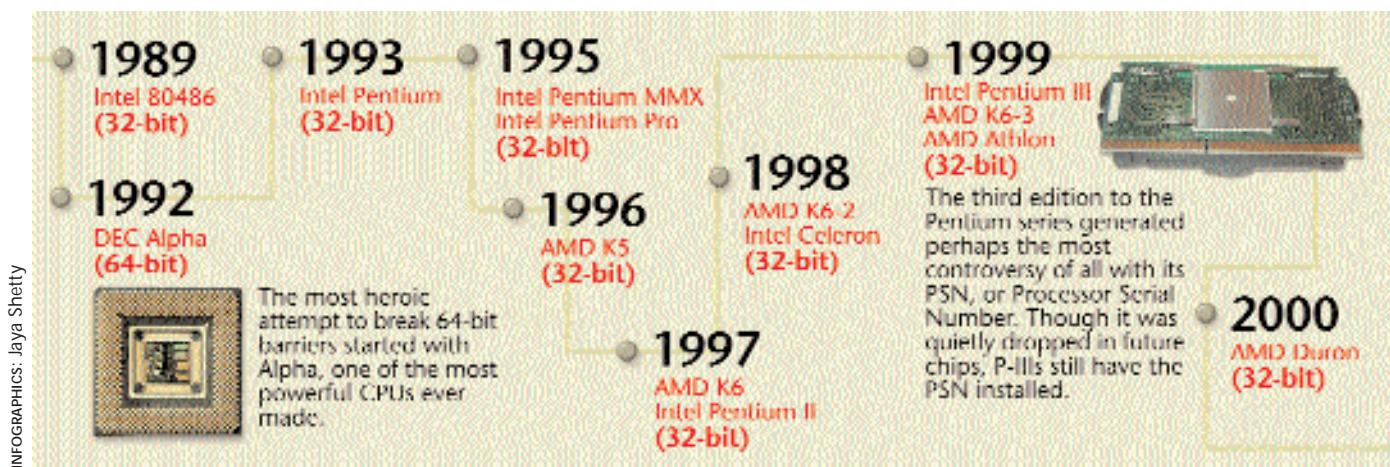
The addition of 64-bit addressing allows chips to support larger amounts of physical memory which, among other things, speeds up large database programs typically used on servers. However, AMD's approach is directly opposite to that of Intel, which designed a completely new

ting down to the brass tacks, the entire shift requires a complete overhaul of your computer system, starting with the most obvious part, the CPU. The 64-bit chips of the future are totally new designs that simply won't jive with what's running today. They've been built anew from the ground up; that means everything dependent on the CPU needs an overhaul, too. This would include a CPU's chipset—a pair of logic chips used in guiding the data traffic throughout a computer system. And if the entire chipset needs to be changed, then your motherboard goes too.

On the software side, things are even more complex. Although 64-bit computing is definitely making some headway on the desktop front, this doesn't

futuristic technology in the hands of the common computer user, this scenario is guaranteed to change.

Despite not having a 64-bit prototype on the market, let alone a fixed release date, it's comforting to see AMD's Hammer series garnering so much support from the software industry. Renowned OS makers such as SuSE, one of the top Linux developers and distributors, have already announced support for AMD's next generation architecture. SuSE has submitted updates for x86-64 to the Linux community with AMD holding on to the likely hope that these revisions will be a part of the upcoming Linux v2.6 kernel. The Linux kernel is built by top programmers including the OS's inventor,



Linus Torvalds. Although patches for x86-64 support have been available for a while, the move by SuSE would provide an official stamp by writing support directly into the kernel. Linux support is extremely crucial for SledgeHammer, more than for ClawHammer, if AMD wishes to gain traction with corporations that purchase heaps of server technology. In fact, this has been the goal of AMD for years. Taking advantage of Linux—an OS that is already popular in the server circles—could be regarded as a smart move by AMD in this direction. Note that Linux already works on several 64-bit chips such as the Compaq Alpha and Sun UltraSparc.

So far, there has been no official statement from Microsoft about weaving support for x86-64 into their Windows operating systems. Although an Alpha-only version of Windows NT 4.0 was developed and released, the dismal monetary performance of this 64-bit chip has resulted in lower than forecasted earnings from the proprietary NT version. This experience would have definitely left the software giant with second thoughts, and it would closely evaluate whether or not attempting for yet another similar release will be worthwhile.

AMD's top brass assure the public that their chips will offer more promise to Microsoft's long term needs than the Itanium chip. There's substance behind these corporate assurances. Itanium is a niche product that can go only so far in a single focused market segment. But Hammer is a technology that encompasses the best of both worlds—64 and 32-bit computing. Even if Intel has plans to execute x86-64 architecture, without pushing it, the situation looks grim for the chip giant as its bothersome competitor is maintaining a one-step lead.

Hyperthreading

A technique used to make a single chip act like two, Hyperthreading is a concept introduced by Intel that lets a chip operate far more efficiently and almost as well as a dual processor machine by taking advantage of formerly unused circuitry on a Pentium 4 chip. With it, a computer can run a single application faster than a standard single processor system can.

Hyperthreading works by taking advantage of additional CPU registers (circuits that help manage data inside a chip) that exist on Pentium 4 processors, but aren't used. With the use of these registers, the chip is better able to manage its existing resources without the need to seek computing power elsewhere. Demos have shown a 30 per cent performance rise when this technique is actually used.

Software developers need to design their goods accordingly if they are to use Intel's power boosting methods, and that takes plenty of effort. So far, only 30 applications

have been optimised for the P4. Fortunately, Windows XP and Linux can both take advantage of the technology. Intel has requested the developer community to design applications, OSs and device drivers suitably.

According to Intel, instead of pushing clock speeds and tweaking parts of the chip for measurable performance gains, efficiency of operation is another factor that needs attention. Though this doesn't necessarily mean gaining the power of two chips, research into fields such as these could not only save money but also contribute to the long-term goal of better chip design down the road. Hyperthreading will make its presence felt in servers in 2002 and in desktops by 2003.

Linux has a patch that enables Hyperthreading on all Pentium 4 processors. Follow the link to download it (you will need to run gunzip for decompression)

<ftp://ftp.kernel.org/pub/linux/kernel/v2.4/testing/patch-2.4.17-pre6.gz>

Looking ahead


In computing, perhaps the most interesting times lie ahead. Progress in 64-bit processing will unlock many avenues and a lot more responsibility will be at stake with regards to who will lead the masses on this technology—the implications encompass a number of computing areas touching the lives of a lot of people.

At the moment, it seems like AMD will secure its place in history with its desktop ClawHammer chip. This will bring the long-awaited 64-bit technology to consumers. While it looks as though Intel has been keeping its mouth shut in response to x86-64, the chipmaker has a few trump cards up its sleeve, lest you forget the Itanium chip bombs.

The chip behemoth is looking at incorporating some capabilities in the next version of the Pentium family. Code-named Prescott, the chip is Intel's plan B that would extend 32-bit architecture to house 64-bit compatibility. Even if the cards are played right, Prescott could face an uphill battle. After spending massive amounts of time and money on constructing the Itanium, abruptly launching a chip with similar traits yet maintaining a higher degree of software compatibility would really undercut Intel's earlier efforts. A Pentium chip with 64-bit extensions could happen if AMD's ClawHammer gains credible market positioning. ■

PRASHANT MASRANI

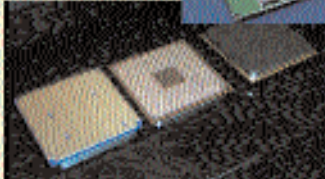
2001



Intel Itanium (64-bit)


IA-64, the underlying architecture of the Itanium processor is exclusive for 64 bit apps, leaving 32 bit apps out to dry. As a result its future is uncertain.

2002



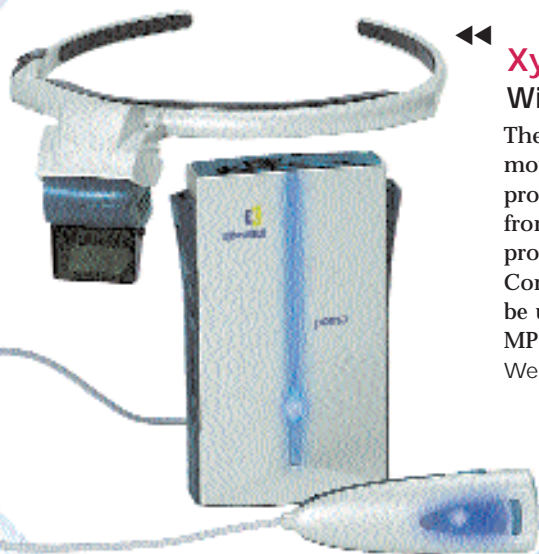
AMD Hammer (64-bit)

Hammer is made up of ClawHammer and SledgeHammer, chips designed for the desktop and server respectively. Till date, these are the first 64-bit chips that are backward compatible, running both 64-bit and 32-bit applications.



Intel McKinley (64-bit)

With their 2nd generation 64-bit chip underway, Intel is shooting for the stars. The chip giant claims McKinley, due for release in mid 2002, will deliver up to twice the performance of Itanium.



Xybernaut poma

Wired to go places

The poma is a small wearable computer with a head-mounted display (640x480 max resolution), which provides an experience similar to viewing a monitor from 2 feet away. It's powered by a 128 MHz RISC processor with 32 MB each of RAM and ROM, a CompactFlash slot and a single USB port and can be used with keyboards and other devices like an MP3 player.

Web site: www.xybernaut.com

small is Beautiful

From palm-sized MP3 players to wearable computers, the latest mantra in digital technology involves shrinking everything in sight

Sanyo SSP-PD7 ►►

Light listening

No, this is not a cell phone. It's an MP3 player that supports SDMI and SP3 security standards. The SSP-PD7 offers 32 MB or 64 MB of storage space using MultiMediaCards while being powered by just one AAA battery! The USB port facilitates easy connectivity to a PC. With an ultra small form factor, this little device is as unobtrusive and portable as audio gets!

Web site:

<http://music.sanyo.co.jp>



PROFX 300 SERIES

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+



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2 Front Speakers

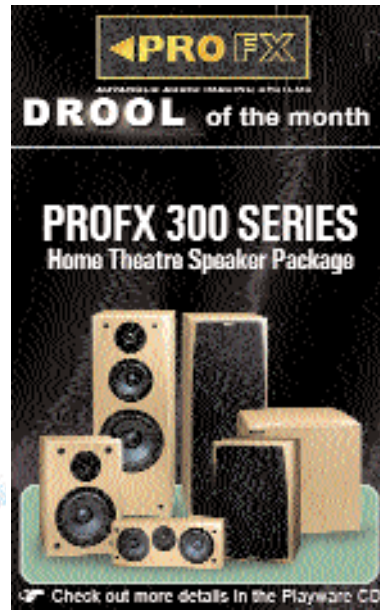
2 Surround Speakers

1 Centre Speaker



◀ Sony Ericsson T68i Beauty with brains

This cellular phone is packed with more features than you could possibly use. Large colour screen, in-built organiser, WAP 2.0 compliancy, voice-activated control and more! Its fast GPRS connection allows you to surf in style, wherever you are and with the Bluetooth and infrared connectivity, the T68i can link with a whole host of devices. MMS (Multimedia Messaging System) support allows you to send pictures and sound clips in sequential messages.
Web site: www.sonyericsson.com




Samsung NEXiO S150 ▶▶ Stay connected

Powered by Windows CE, this PDA features a 5-inch, reflective LCD, which supports resolutions up to 800x480, and an in-built, data-capable CDMA2000 1x module. An Intel StrongARM processor, 32 MB of ROM, and 64 MB of RAM power the NEXiO. Currently there's no CompactFlash or SD card slot, but a USB port allows you to connect your mouse, keyboard or digital camera. You can even connect to your corporate network using the wireless LAN module that transmits data at up to 11Mbps (802.11b standard).
Web site: www.samsungelectronics.com



◀ Panasonic SV-SR100 Fistful of music


The Panasonic SV-SR100 is capable of recording high-quality music into its internal SD Memory Card (ranging from 8 MB to 512 MB) without the need for a PC! Compatible with CD-R/CD-RW disks and supporting different audio compression formats such as AAC, MP3, and WMA, this little beauty will ensure that you don't skip a beat. Plus it even has an analog input for those who still use audiocassettes.
Web site: www.panasonic.com



1 Powered Sub-Woofer

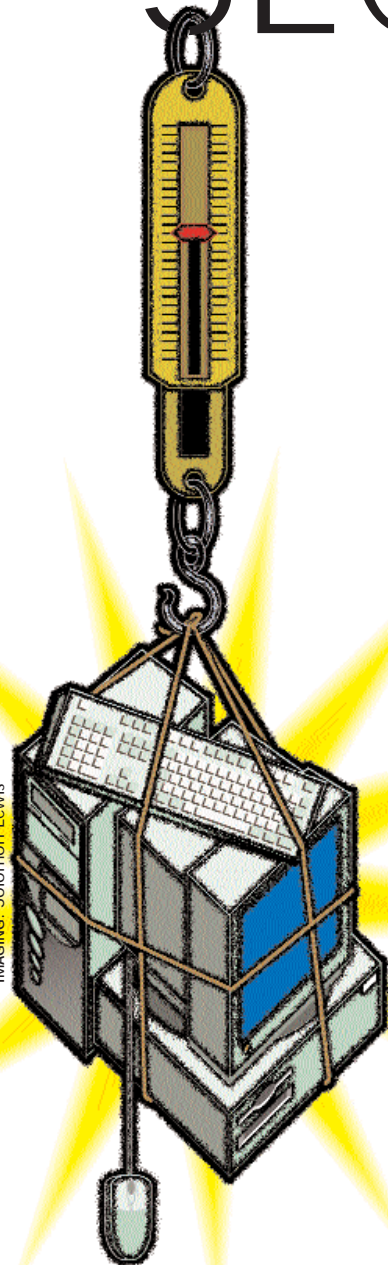
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SECONDS SALE



IMAGING: Solomon Lewis

Strapped for cash but still yearning for that second PC? Here's an idea: how about a secondhand computer for around Rs 12,000!

decent condition? What happens if it breaks down? Will you get a warranty? Well, let's take a look.

Why buy a secondhand PC?

The first and most obvious consideration, of course, is cost. The second is what you're going to use the computer for.

Most people buy way more computing power than they actually need or will be utilising. If you intend to delve into high-end graphics and design, run software such as Photoshop or play games, you need a powerful computer. But if you're going to use it for surfing the Web, chat, or for simple word processing then a P4 running at 1.5 GHz with 128 MB RAM and a 40 GB hard disk is unnecessarily extravagant. A Pentium II or a Pentium III with lower RAM and storage would do just fine. For simple data entry you can get by with a 486 for as little as Rs 5,000. (See box 'Price Watch' for approximate prices).

The bottom line is, if you don't need a cutting edge computer, the secondhand market can provide you with some great deals.

Where can I buy a secondhand PC?

There are all kinds of used PCs in the market, from 486s to fairly decent Pentium III machines. They come from home users who trade in their computers for new systems to keep up with the rapid advancements in computing. Many companies also sell off entire office systems, including PCs, peripherals and office automation systems—which could be anywhere from 50 to 500 PCs at one go—to a vendor and buy a similar number of new PCs. The vendors refurbish these machines and sell them in the open market, usually small towns.

Ideally, sourcing it from friends, neighbours or a person you know is the best option. This way you have some idea about the condition the computer was kept in. Alternatively, you could ask your friendly neighbourhood dealer to keep a lookout for people selling off their old PCs.

Since it isn't everyday that you'll have people you know selling off computers, try classified advertisements in your local newspaper where you'll find a number of vendors advertising the sale of used or refurbished PCs.

Manoj Shah, of Used Computer Bazaar, a division of Hemjay Technology and Marketing Services, Mumbai, has an entire section just for refurbished PCs, ranging from 486s to Pentium-IIIs to secondhand notebooks and peripherals. He sells over 75-100 secondhand machines a month to customers from Maharashtra, Gujarat and Rajasthan.

Auctions at sites such as *Baazee.com* and *Indiatimes.com* are also a great source

caution Test Drive before you Buy

If your vendor gives you a testing warranty then it is all the more imperative that you know what to watch out for while giving the machine a 'test drive'.

- Make sure that the machine 'POSTs' (Power Supply On Self Test) at the first attempt.
- Check the hard disk drive for bad sectors. Sometimes a freshly formatted drive will not reflect bad sectors if you run an ordinary scandisk. A low level surface scan is more likely to reveal problems.
- Play a CD or copy files to check if the CD-ROM drive is working fine.

Buying a new PC is a major investment. Even though technology has become cheaper, a new PC can set you back by anything upward of Rs 25,000. And this is just for a PC with the bare minimum features.

But now, there's a way out for those of you that don't have enough money to spring for a new PC. Used or secondhand computers available for significantly less could serve you just as well. But a few important queries need to be answered first: can you get a used computer in a

for individuals or dealers looking to sell old PCs.

Used computer = Beat up computer?

Not all used computers are ancient relics. Some traders just sell you an old PC 'as-is', without any support or warranty that the PC will run, while other vendors like Shah refurbish the used computers with new cabinets, keyboard and mouse and do a complete system test of all the parts before selling it.

Shah sources PCs from his existing customer base consisting of home users. "We buy back old PCs from customers who want to trade them for new systems. PCs sold off in lots by companies tend to be very old and redundant. In fact, 75 per cent of people who opt for secondhand PCs want at least a Pentium II or a Pentium III and don't mind spending a little more as long as they get a reliable PC."

What do I need to watch out for?

If you're buying a PC from a reliable source who can vouch for the condition of the PC, you won't have much of a problem. But if you're buying it from an unknown source, you should inspect the machine thor-

oughly before confirming the purchase.

While giving the PC a once over, check out what's inside the cabinet to ensure that the parts aren't damaged.

- Watch out for damaged motherboards. Tell tale signs would be jumpers with wires, or soldering work done on the motherboard. Make sure the 'goldfinger contacts' (those little gold bars) on the motherboard, RAM, or cards are not rusted and corroded.
- Make sure the heat sink fans on the

motherboards. Some dealers will give you what is known as a 'testing warranty', and let you test the PC in the store so that you're satisfied with the PC's performance (see box 'Test Drive before you Buy'). But it ends when you buy the PC and leave the store. Other dealers offer an eight to 10 day warranty.

Shah offers a 30-day warranty on the used PCs he sells, creating confidence in the customer's mind about the quality and reliability of the product.

So, what do you do in case you don't get a warranty at all? Buy an AMC (Annual Maintenance Contract) for your secondhand PC, which will provide technical support in case there are any problems with the PC. An

AMC for a secondhand PC shouldn't cost you more than Rs 1,500-2,000.

Most AMCs only cover service. You could also buy a component inclusive AMC, which is quite expensive, but covers the cost of replacement of components. But if you're buying a PC that is more than three to four years old, finding replacements for components such as a 540 MB hard disk is virtually impossible.

At what point should you buy a new PC?

While a secondhand PC is a great buy, you need to watch your budget closely! Anything over Rs 15,000 for a secondhand PC (with AMC as an additional charge) means you should seriously consider whether you wouldn't be better off chipping in just a little more for a new PC with a full warranty!

It's difficult to predict how long a secondhand PC will last. It could last from a month to a year or two, provided it isn't too old—maybe two to three years old—and was kept in a dust free and humidity-free environment.

Ultimately, there will come a time when you'll have to say goodbye to your secondhand system and pack it off to a museum or the nearest scrap dealer. But till then there's no reason why you can't get the most out of your secondhand PC! ■

AVINA LOBO



Manoj Shah
USED COMPUTER BAZAAR,
MUMBAI

"We refurbish old PCs and provide a 30-day warranty as it helps create confidence in the mind of the consumer about the reliability of our product"

motherboard are working and not clogged with dust. If they are, replacing them will cost you just Rs 500.

- Make sure the power supply fan works.

Ask the vendor for the configuration of the secondhand PC. Ideally, the best configuration to go for would be a processor running at 400 MHz with at least 64 MB RAM and a 4.3 GB hard disk. Your CD-ROM drive's speed should not be less than 24x or 32x. Apart from this, you should look out for:

■ **The motherboard:** This is an area where you should take particular care. Your best bet would be a motherboard not older than one-and-a-half to two years. The Intel 810 (or 815, 810e, 815e) motherboards are best as they support widely used processors such as Celeron and Pentium IIIs with clock speeds up to 700-800 MHz. Make sure the board has support for 133 MHz FSB (Front Side Bus) for later upgrades to increase processor power. Do not buy anything less than a 440BX chipset. Other cheaper motherboard alternatives are VIA 693, 694 and the Apollo Pro series.

■ **The monitor:** A monochrome VGA monitor will do just fine for data entry or word processing, and it will cost about Rs 1,000. A 14-inch colour monitor with a resolution of 800x600, on the other hand, should cost you Rs 3,000.

Will I get a warranty?

Secondhand PCs normally don't carry war-

Price Watch

Here's a look at what you can get at different price points*

Rs 5,000 A 486 with 8 MB RAM, 540 MB HDD, 1.44 MB floppy disk drive, monochrome VGA monitor, keyboard and mouse

Rs 10,000-11,000 Pentium 166 MMX with 32 MB RAM, 2.1 GB HDD, floppy disk drive, CD-ROM drive, soundcard, speakers, colour monitor, keyboard and mouse

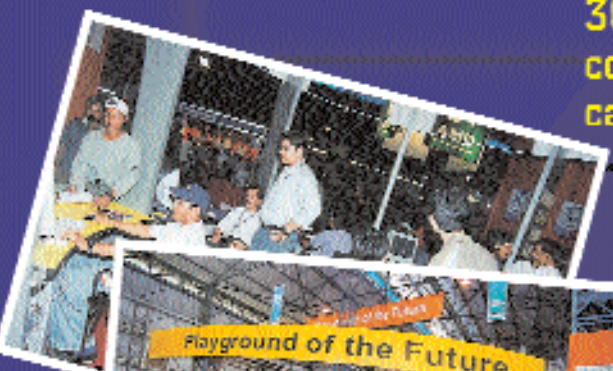
Rs 12,000-13,000 Pentium II 300 MHz with 128 MB RAM, 8.4 GB HDD, CD-ROM drive, colour monitor, keyboard and mouse

Rs 15,000-16,000 Pentium III 500 MHz with 128 MB RAM, 8.4 GB HDD, CD-ROM drive, colour monitor, keyboard, and mouse

*These are approximate rates and have been compiled from several dealers in Mumbai. Actual rates might differ across cities.

Your window to

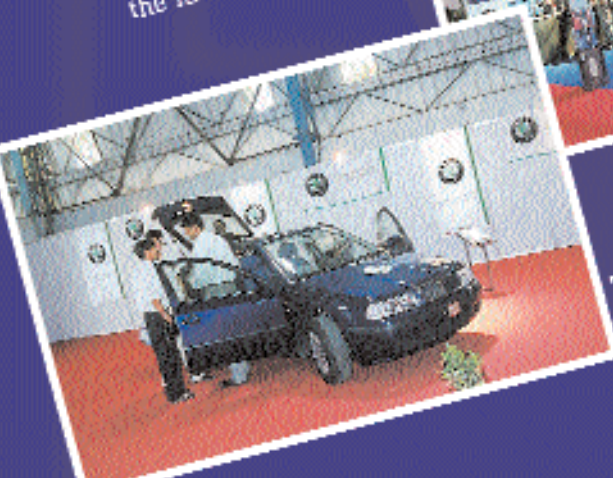
30,000 visitors had their chance to ogle at the coolest devices and gadgetry. Here's a taste in case you didn't make it to the show...



Playground of the Future

When it comes to getting a gamer's hands dirty, there's nothing like a top-of-the-line force feedback joystick and steering wheel! This zone saw the marriage of formidable technologies such as blazing fast gaming machines and funky display systems coupled with lots of heart-pumping adrenaline. Here, people also played with the Sony PSOne gaming console and an array of cool radio controlled toys and gizmos.

Your big chance to get up close with the latest in technology



The Skoda Octavia: Competition for the Ford?



Seagate Digital Home

The Digital Home of the Future provided visitors a host of experiences such as the mindblowing THX home theatre system, an advanced user-controlled lighting and ambience system plus futuristic security and intrusion detection devices.



Five categories, 10 really cool products and looks that would stun your senses — that was the GENi pavilion. With megapixel cameras that fit in the palm of your hands, futuristic MP3 players, digital assistants, the world's smallest laptop and gaming controllers right out of the flight bridge of the *Starship Enterprise*, this zone was a visual buffet for any techie and gizmo freak.

technology GENi

Hot technologies Cool Products

22nd & 23rd March, 2002

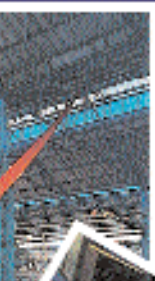


Samsung Office of the Future

Imagine an environment that makes work far more enjoyable and increases your efficiency at the same time! The Office of the Future was filled with next-generation multifunctional devices, TFTs that could change orientation to the kind of work you were doing, advanced lighting and computerised security systems along with state-of-the-art videoconferencing and A/V systems. Now imagine controlling all this by a single touchscreen-based interface!



Gaming and excited tech enthusiasts make a lethal combination!



The Ford Mondeo on display at GENi

Visitors crowd around the 'Digit on the spot' quiz at the show



How we Test



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

The Digital Media Test & Research Centre (DMTRC) conducts a series of elaborate tests to evaluate the merit of each hardware and software product. To ensure that our readers have all the information they need to make an informed buying decision, engineers at DMTRC evaluate and review the latest hardware, software and technology services in accordance with the most up-to-date evaluation processes and methodologies used around the world.



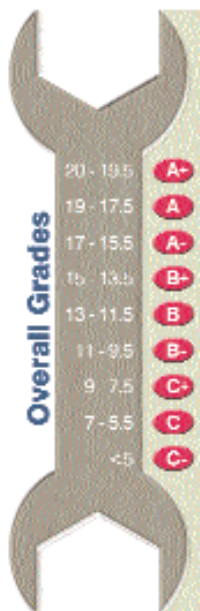
Comparison Tests

We use a dual rating system, the first of which is applied to the Comparison Tests in which we compare the performance of products within a particular category.

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

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

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



The Awards

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

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



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

In Bazaar

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

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

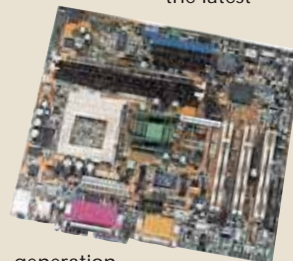
The greater the number of arrows, the better the product. This simple five-point rating system is designed to give you an easy-to-interpret assessment of a product. For example, a product that receives an overall score of five arrows signifies an outstanding buy!

The 5-point Rating System used in Bazaar

| | |
|-------|---|
| ↗↗↗↗↗ | 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 |

In Test this Month

We test 47 different motherboards, designed to support the latest



generation of processors. Whether you are looking to upgrade your old system or to buy a brand new one, this test will help you make the right decision for this critical, but often-ignored, component. With 12 brands and 25 chipsets, this is our most comprehensive motherboard comparison test to date. This test comes more than a year after our last motherboard shootout—the Indian market then was sadly devoid of major international brands. But now you will have no problems in finding an ASUS, MSI, Soltek, Gigabyte, DFI, ECS, or a Mercury offering their entire product range.

The test also gave us the opportunity to take a first look at some of the most bleeding-edge technologies such as ATA-133, USB 2.0, DDR333 memory, Memory Stick support, Dolby Digital surround sound capabilities and a plethora of other goodies.

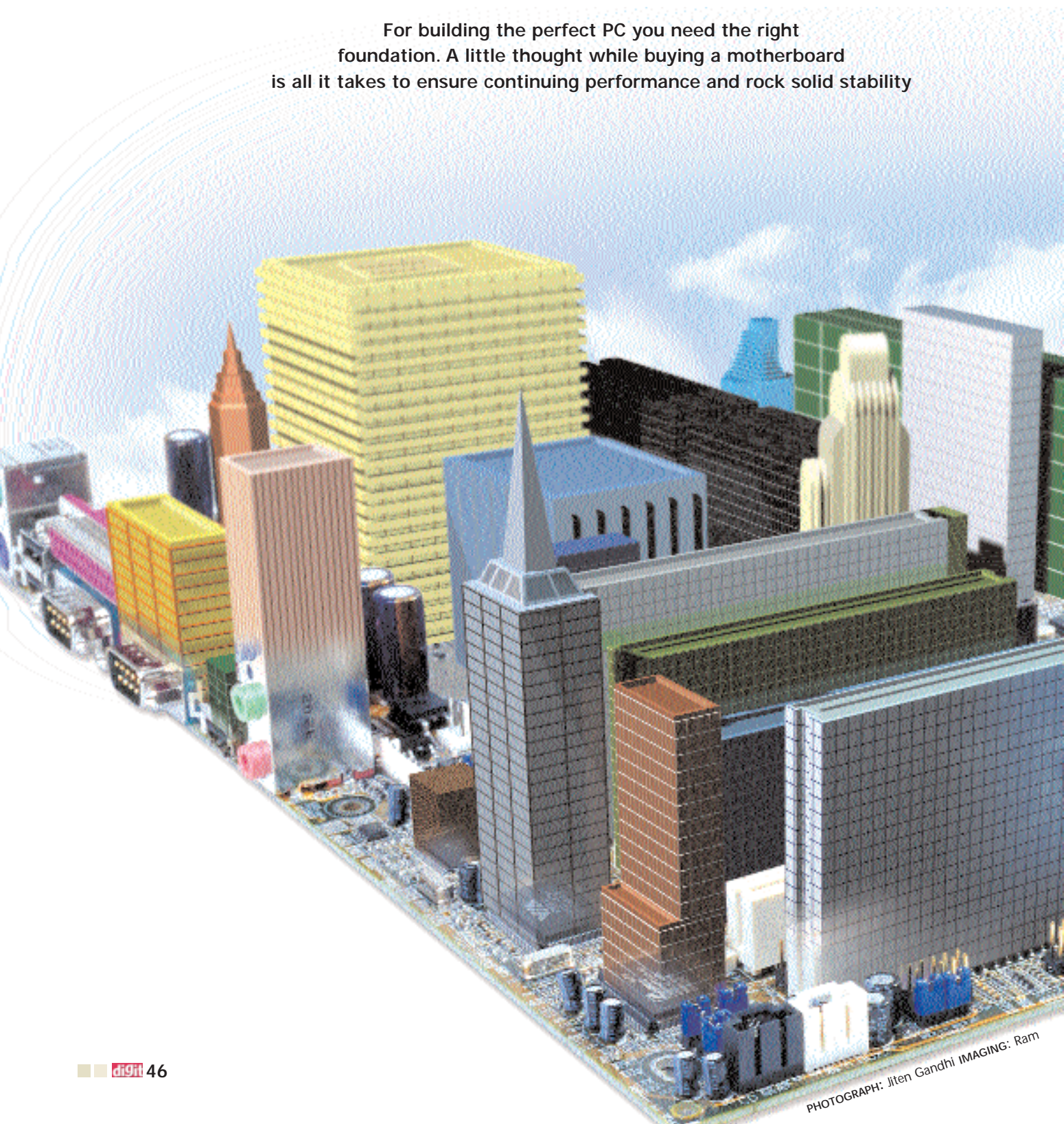


Mindware

Look up the test process in the Test Drive section of the Mindware CD. Also featured on the Mindware CD are reviews of some select motherboards.

Quake-proof

For building the perfect PC you need the right foundation. A little thought while buying a motherboard is all it takes to ensure continuing performance and rock solid stability



your foundation!

Ask anybody about the computer he or she owns and you get to hear descriptions that go something like “a Pentium III 750 with 128 MB of RAM and a 30 GB hard drive”. While this gives you a fair idea of the system, it misses a vital piece of information—the motherboard. What makes this component so important is the fact that all the other components plug into and communicate with each other via the motherboard. The motherboard or mainboard acts as the central (and largest) part of your computer. All components of the machine—video cards, soundcards, hard drives, CD-ROM drives and even external peripherals like printers—are eventually connected to the motherboard.

When you want to plug in a new piece of hardware in your machine, guess what's the deciding factor? The type of motherboard. This determines which CPUs will and will not work with your system. Thus, the task of buying a motherboard shouldn't be taken lightly.

Look at it in this way. Either you can save money by buying a cheap, unbranded motherboard and suffer sluggish perform-

ance and lose out on upgradability, or choose wisely and buy a board which performs well, is compatible with the next generation CPUs, and saves you the trouble and cost of buying another motherboard in a year or two.

What is a chipset?

The motherboard is essentially built around a chipset that supports a specific class of processors and memory. The main system chipset comprises the logic circuits that basically contain a blueprint of how the processor, memory and other integrated components on the motherboard are meant to communicate. It acts as a hub, controlling the transfer of data between the processor, its cache, system buses and various peripherals.

The timely transfer of data without errors is probably the most important function of a system chipset and its proficiency in performing this task dictates how well the system performs as a whole. Apart from the main system chipset which is commonly referred to as the North Bridge, motherboards also have a separate South Bridge that integrates, manages and controls all 'external' IDE, ISA, PCI, USB, etc devices.

However, the North Bridge or the main system chipset is the one that we shall refer to as it directly impacts performance.

Is the chipset important?

Chipset design is a complicated task that has been mastered only by a few manufacturers. Processor manufacturers such as Intel are ideally positioned to design chipsets that suit their needs. Intel designs chipsets that work with its own processors—that's why you find few inherent problems with Intel chipset-based motherboards.

AMD, on the other hand, has preferred to let third-party manufacturers like VIA, SiS and ALi produce the bulk of the chipsets supporting its processors. VIA, especially, has been very successful at squeezing out the maximum performance from AMD's processors.

The performance numbers derived from our tests indicate a clear pattern which separates the good chipsets from the ordinary ones. For the Pentium 4, we discovered that the Intel 850 series-based motherboards, coupled with RDRAM, outperformed every other motherboard by a fair degree.

Intel's stop-gap SDRAM solution, the 845 series-based motherboards performed poorly when compared to the 845D-based solutions using DDR SDRAM. The VIA P4M266 and the P4X266 chipsets notch up some really interesting scores, at times even beating Intel's own SDRAM chipset.

We would recommend the Intel 845 for SDRAM, Intel 845D for DDR SDRAM and the Intel 850 series for RDRAM.

For the AMDs, the top-of-the-line chipset is still the VIA KT266A, though the KT333 should technically outperform its older brother when clubbed with the newer DDR333 memory. Another interesting observation is that nVidia's first foray into chipsets has proved to be a decent performer. The nForce 420-D-

Digit Test Process

Qualification criteria: Since the motherboards that we received were designed for specific processor and memory (RDRAM, DDR SDRAM, SDRAM) combinations we categorised the test process to include:

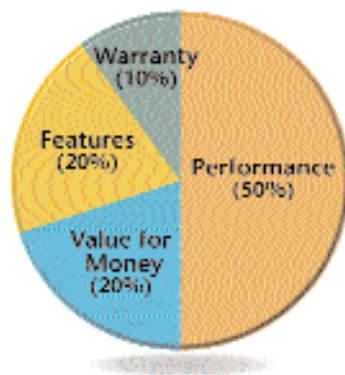
- Motherboards for Pentium4 (socket 478) supporting RDRAM, DDR SDRAM or SDRAM memory
- Motherboards for Pentium III / Celeron (Tualatin only) that used SDRAM memory
- Motherboards for AthlonXP / Duron (Palomino) supporting DDR SDRAM or SDRAM memory

Older motherboards that were designed for the Pentium III (Coppermine) and Athlon (Thunderbird) processors were excluded from the test.

The test bench used the following common components:

nVidia GeForce3 64 MB DDR; 256 MB PC800 RDRAM or 256 MB PC2100 DDR SDRAM or 256 MB PC133 SDRAM (as applicable); Seagate Barracuda ATA IV 7200RPM Hard disk.

The best available hardware was used to test each motherboard type to ensure that the performance scores were not restricted by another component/subsystem.



Test methodology: The motherboards were evaluated on various parameters using a series of benchmarks. These included Performance (which was given a 50% weightage), the Features offered (20%), Value for money (20%) as well as the type of warranty offered (10%). The final rating of the motherboard, which is representative of its overall worth, was arrived at by putting together the scores in each of the individual areas viz. of performance, features, value-for-money and the warranty offered.

Performance tests: Performance was evaluated using a series of benchmark programs that tested the performance of vari-

ous subsystems :

Processor subsystem: Using SiSoft Sandra 2002 Pro (Normal/Multimedia) and MadOnion's PCMark2002

Memory subsystem: Using PCMark2002 (Memory Index) and SiSoft Sandra 2002 Pro

Disk subsystem: Using SiSoft Sandra 2002 Pro (Drive Index) and HDtch 2.61

Graphics subsystem: Using Quake III Arena v 1.30 (Demo "four") and 3Dmark 2001SE

System-wide: Video Encoding using VirtualDub 1.4.7, Content Creation Winstone 2001 and Business Winstone 2001

Features: We awarded the motherboard points for the presence of features like ATA 133 and USB 2.0 support, the number of PCI and memory slots available, availability of on-board Ethernet or on-board 6-channel audio, support and other performance boosting features like BIOS supported overclocking.

Value for money: This score is derived taking into account the is a ratio of a product's Features and Performance to its price.

Warranty and support: We took into account the duration and other terms and conditions of the warranty offered (replacement/repair).

based ASUS A7N266-E performs brilliantly with DDR SDRAM.

The SDRAM solutions are best suited for Durons and lower speed Athlons. There is a world of difference between the performance of a KT133A or a KM133-based motherboard and the KT266A/KT333 motherboards. Our favourites are the KT333-based motherboards for high-speed Athlons and KT133A-based boards for Durons.

Memory matters

With the arrival of high-speed memory like DDR SDRAM and RDRAM over the last couple of years, choosing a motherboard has become more complicated.

Broadly speaking, if you are looking for a low cost solution then SDRAM is the way to go, even though all the tests show that this has a severe impact on performance, especially with the Pentium 4 and Athlon XP processors.

With the Pentium 4 processors, RDRAM is the fastest solution, but is quite expensive given the RAM and mother-

board prices. This is because RDRAM motherboards are manufactured using a six-layer fabrication process while the DDR boards use a less expensive four-layer process. For the best balance of price and performance, we recommend a DDR SDRAM option.

For the Athlon XP, the choice is easy. It works best with DDR SDRAM and the difference in performance when compared with SDRAM is considerable.

For Pentium III and Celeron processors, SDRAM is the only option available.

Performance numbers

The overall performance of a computer depends on performance of various specialised subsystems—the processor subsystem, the disk subsystem, the memory subsystem and the graphics subsystem. The motherboard is the foundation on which your entire system is built. A good motherboard takes advantage of every drop of performance that individual components (say, the graphics card) offer and ensures the smooth flow of data.

Processor subsystem

A motherboard is designed from chipset up to support a specific type or class of processor and its performance and feature set depends on the chipset. For instance, the Pentium 4 processor works differently than the Pentium III, thus the motherboard design is modified to take advantage of the higher clock speeds of the Pentium 4 and also the higher front side bus (FSB) frequency (400 MHz quad pumped). On the other hand, the Athlon XP processor requires an FSB speed of 266 MHz.

Pentium 4: As expected, the results varied according to the type of memory being used. However, there were a few surprises in store. The top performer in the Pentium 4 segment was not the Gigabyte GA8ITXE (using RDRAM) with a PCMark CPU index of 5307; it was outscored by the MSI 845 Ultra-C (using DDR memory) by a significant 24 points.

This is surprising, as you'd expect that Intel's heavy optimisations would have given the 850GB-based board an edge. →

The PCMark CPU index shows a variation of about 300 points across all the DDR boards. This shows us how the chipset implementation can directly impact performance numbers even while using the same processor. The lowest score of 5012 went to the Gigabyte GA-8S MML, which is a SiS 650-based DDR solution.

The best performing SDRAM board in this category was the Intel 845 chipset-based Mercury KOB845NFSX, which managed to score a respectable PCMark CPU index of 5233.

As you will see in our Scoreboard table, minor but significant optimisations that manufacturers like MSI and ASUS incorporate clearly show up in the SiSoft Sandra CPU Multimedia benchmarks. All the Intel chipset based boards score about 8600 odd points in the CPU Integer benchmark. The MSI 845 Ultra-C and the MSI 845 Ultra-ARU however score 8779 and 8758 respectively, which proves that they squeeze every last bit of performance out of the Pentium 4. Even the original Intel D850MD RDRAM-based board is relegated to scoring only 8673. A similar trend was observed in the FPU SSE benchmarks where the MSI board outshone all others.

Athlon XP/Duron: The competition in this category was fierce with the top boards scoring 4900 and above in the PCMark CPU index. The ASUS A7V266-E scored a hefty 4957 and the DFI AD70-SC scored an impressive 4908, but they couldn't touch the nForce-based ASUS A7N266-E. It was the only AMD board which breached the 5000 barrier—it notched an amazing score of 5006.

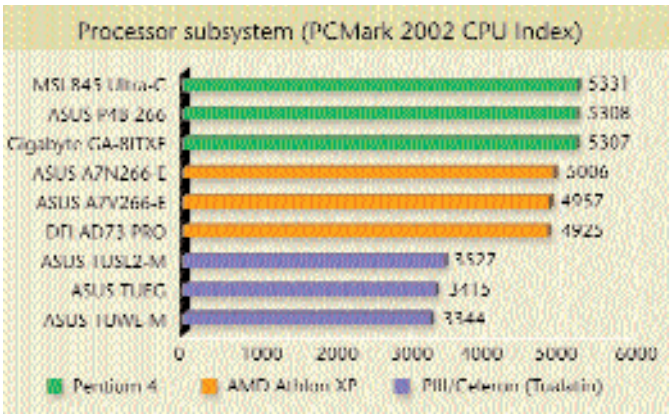
The pure integer crunching strength of the AMD boards could be seen in the

| Which Chipset is for me? | | | |
|--------------------------|--|--|---|
| | Pentium 4* | Pentium III/Celeron** | Athlon XP/Duron |
| SDRAM | Intel 845 | Intel 810E2, Intel 815EG, Intel 815EP, SiS 630ET | VIA KT133A, VIA KM133A, VIA KLE133 |
| DDR SDRAM | Intel 845WN, Intel D845BG, Intel 845D, SiS 650, SiS 645, VIA P4M266, P4X266A | Not available | VIA KT333, VIA KT266A, nVidia nForce 420-D, SiS 735 |
| RDRAM | Intel 850GB, Intel 850MD | Not available | Not available |

**This refers to Socket 478 processors only **This refers to the Tualatin processors only
The table reflects only the chipsets that we've tested*

SiSoft Sandra CPU Integer benchmark as almost every board scored over 9000 compared to the relatively lower scores of the Pentium 4 boards which hovered around

liantly. The ASUS TUSL2-M was particularly spectacular, scoring 3527 in the PCMark CPU index. This was more than 100 points over the older ASUS TUEG which scored just 3415. The ASUS TUSL2-M is a Micro ATX board which performs brilliantly with both the Intel Pentium III and the Celeron processors.



8600. The Soltek SL75DRV4 took top honours, beating the ASUS A7V266-E by about 6 points, with a score of 9210. A score of above 9000 should ensure adequate performance, while anything in excess of 9150 is really impressive.

Pentium III/Celeron (Tualatin): This category is dominated by ASUS with their latest Tualatin boards performing bril-

ly. To squeeze every last drop of performance, the memory subsystem must have very tight memory timings and implementation.

Despite the presence of strict memory standards, there will be slight variation in the memory modules produced by different manufacturers. The motherboard has to ensure that the memory slots can han-

Memory sub-system
The memory sub-system is the most critical because it needs to constantly feed the proces-

sor with data. To squeeze every last drop of performance, the memory subsystem must have very tight memory timings and implementation.

Despite the presence of strict memory standards, there will be slight variation in the memory modules produced by different manufacturers. The motherboard has to ensure that the memory slots can han-

A Handy Checklist

Buying a new motherboard? Here's our checklist for what you need to look out for:

Maximum CPU speed supported: This can save you a lot of heartache if you plan on upgrading your CPU at a later date. You can get this information from the motherboard's manual or from the manufacturer's Web site.

Number of PCI slots: More PCI slots give you greater flexibility in case you decide to add PCI devices later. As a rule, look for a minimum of three PCI slots, though six slots would be ideal.

More memory slots: While most motherboards come with two memory slots, having a third or fourth RAM slot may come in handy if you need to add more RAM later.

USB 2.0: You should look for at least four USB ports as USB is soon becoming the interface of choice for most PC peripherals.

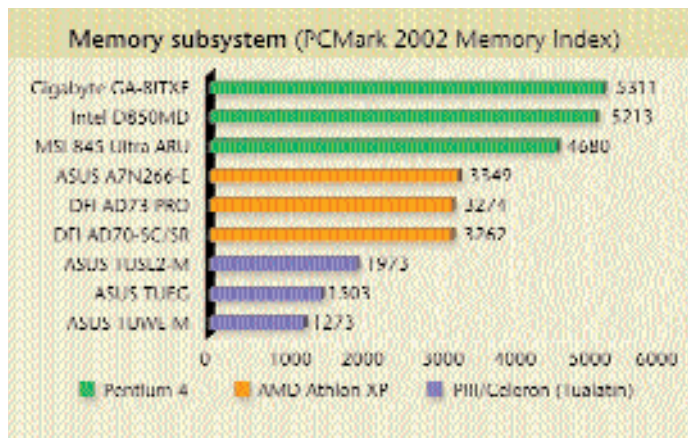
Support for ATA-133: With hard disks getting faster, ATA-133 provides that much needed bandwidth for applications such as video editing and computer games.

Hardware monitoring: This is one feature that you simply cannot do without as

processor speeds (and running temperatures) keep rising. In case the CPU fan fails, these motherboards will automatically shut down the system and prevent damage to the core components.

Warranty and support: Check whether the dealer is providing at least a two-year replacement warranty and has a dedicated RMA centre in India.

Regular BIOS updates: Regular BIOS updates eliminate bugs that might have cropped up after the motherboard was shipped.



de these variations and at the same time maintain accurate and tight timing cycles to ensure error-free and high-speed data throughput.

Pentium 4: It's really hard to compete with the RDRAM boards due to the raw memory throughput that RDRAM offers. The scores for both the Intel D850MD and the Gigabyte GA-8ITXE (based on the Intel 850GB) are in the 2.5 GBps range for both ALU/RAM and FPU/RAM benchmarks in SiSoft Sandra. This is about 20 per cent higher than the closest DDR competitor. The Gigabyte GA-8ITXE comes out on top scoring 2519 MBps in ALU/RAM and 2520 MBps in FPU/RAM tests. This proves beyond any doubt that RDRAM has no peer when it comes to pure memory bandwidth.

The DDR SDRAM boards based on the Intel 845D chipset came next, scoring in the 2 GBps range. It was a tough call in the DDR segment—the ASUS P4B266, MSI 845 Ultra-C and the MSI 845 Ultra-ARU were all neck and neck but the MSI 845 Ultra-C was just a shade faster with scores of 2044 MBps in the ALU/RAM and 1964 MBps in the FPU/RAM tests. The SiS 645 based ASUS P4S333 trailed the pack and only managed a paltry 1.8 GBps in the SiSoft Sandra memory benchmarks.

The conventional SDRAM boards trailed far behind as expected. Only Mercury's KOB845NFSX hit the 1000 MBps mark in the ALU/RAM benchmark. No other SDRAM-based board for the Pentium 4 even came close to this number! Athlon XP/Duron: Coupled with the formidable Athlon XP 2000+ even the venerable VIA KT133A chipset using ordinary PC133 SDRAM showed some of its bite here. The Gigabyte GA-ZXR was the only KT133A board we received and it recorded some impressive scores in the SiSoft Sandra

memory benchmark. In fact, both the Gigabyte entries (the other being the G A - 7 Z M H based on the KM133A chipset) touched the magical 1 GBps throughput mark.

The DDR SDRAM based boards were in a different league altogether. The

VIA KT333 based boards did not get a chance to shine as we used them with slower DDR266 memory modules (it will be some time before DDR333 memory debuts in India). Nevertheless, this is the first time we've seen a motherboard with support for a new memory standard without the memory itself being available in the market. However, the KT333 chipset is backward compatible and you can use DDR266 modules on these motherboards.

Surprisingly, the ASUS A7V266-E (using the older VIA KT266A chipset), came out on top with scores of 2037

MBps and 1888 MBps in the ALU and FPU tests. This board is so finely tuned that it even beats the KT333-based boards in pure memory throughput!

PentiumIII/Celeron (Tualatin): The variation in performance here is astonishing, with even the ASUS TUSI-M performing miserably, scoring only about 460 MBps which is about half of what its cousin, the TUSL2-M, achieved using the same memory and processor. The latest Intel 815EP used by this board is the best PC133 solution by far and the ASUS TUSL2-M squeezes every single drop of performance from it.

Disk subsystem

Performance within this subsystem depends on the motherboard's implementation of IDE channels. An underperforming IDE subsystem can cripple performance when it comes to video editing and other data-hungry applications. Each time these applications read or write data from or to the disk, instructions are passed to the drive controllers' device driver. The driver then pumps data through the PCI bus to the IDE controller. Improper implementation can severely hamper the entire data transfer process. If the PCI bus has not been iso-

Overclocker Friendly, Anyone?

Pushing the performance of hardware components has always excited PC enthusiasts, and we've never had it this good! Today, almost all motherboard manufacturers have some overclocking features built in, but some boards are simply an overclocker's dream come true.

The ASUS A7V333 is one such example. Supporting the latest DDR333 memory standard, you can boost your processor speed by adjusting the clock multipliers or the FSB speed. It even allows you to vary the CPU to RAM ratios and tweak the Vcore voltages. Imagine being able to push up the FSB speed from 133 MHz to a whopping 227 MHz in 1 MHz increments!

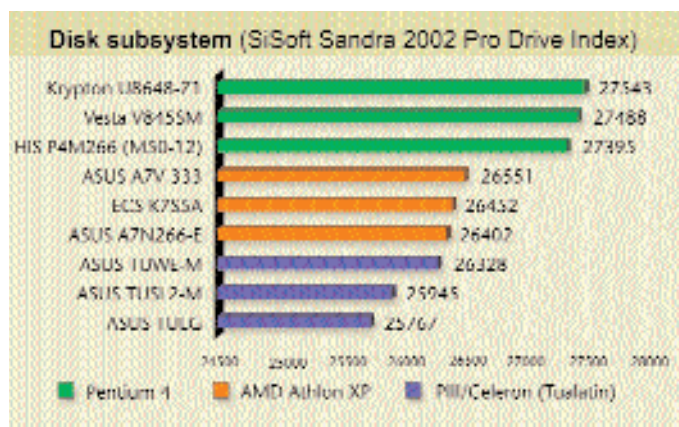
Almost all ASUS and MSI boards for the AMD processors have a decent amount of space around the CPU socket that let you install a larger than standard heatsink. The ASUS A7V266-E and the MSI KT3Ultra-ARU are prime examples of such overclocker friendly motherboard layouts. Also, ASUS has made it a point to ship motherboards with a minimum of three fan connectors, which comes in handy when you need extra cooling.

Soltek's SL75DRV4 is not too far behind.

In addition to the usual FSB and CPU Vcore adjustments, it even lets you tweak the AGP and RAM voltage! Plus the BIOS implements the unique RedStorm overclocking feature, which automatically checks for the highest performance settings that can be made without compromising on stability and applies them without needing a system reboot.

While AMD boards have always been overclocker friendly, the Pentium 4 boards are not too far behind. MSI's 845 Ultra-ARU and the ASUS P4B266 allow FSB speeds up to 200 MHz, again in 1 MHz increments along with voltage adjustments for both Vcore and RAM.

The MSI 845 Ultra-ARU provides a hardware diagnostic device called the 'D-Bracket', which has four bi-colour LEDs. At reboot, these LEDs depict the POST (Power On Self Test) status and if any problems arise, they help to identify what has gone wrong. This is easier than the 'beep' error codes used by most motherboards today.



lated from the noise of other devices on the motherboard, you might experience data corruption and lock-ups when large amounts of data are suddenly pushed through the bus, as it collapses under the load.

Pentium 4: Intel's IDE controller implementation has always been excellent. This is all the more apparent in the scores of the Intel chipset-based boards which hovered above the 25000 mark in SiSoft's Drive Index. However, VIA has made good progress and has caught up with Intel, with scores around the 24500 mark. A huge surprise was when the Vesta V845SM (using the Intel 845 chipset), took the top spot by hitting a score of 27488 with a sequential read speed of around 40 MBps.

Athlon XP/Duron: The VIA based Athlon boards were quite disappointing and their scores were patchy at best. Top honours went to the ASUS A7V333—it scored a meaty 26551 in the Drive Index. Pentium III/Celeron (Tualatin): Strangely, the ASUS TUWE-M based on the 810E2 chipset took top marks in this category by scoring 26328.

As a general rule, any motherboard that scores over 25,000 in the SiSoft Sandra Drive Index should be considered a great performer, while the few that cross 27000 are truly exceptional.

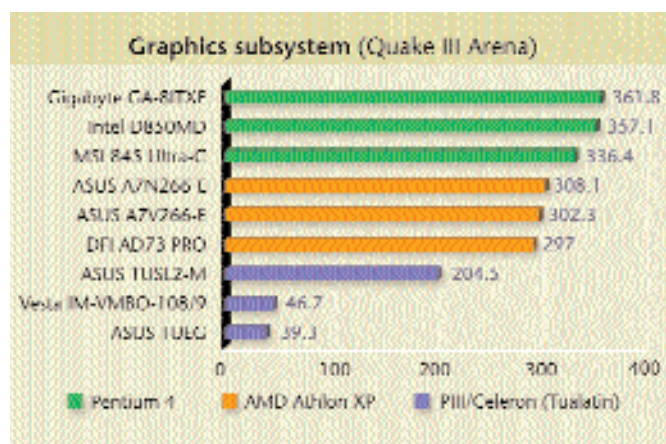
Graphics subsystem

This subsystem affects the video performance of the PC and is responsible for generating the images you see on your monitor. The bandwidth offered by the AGP slot via the AGP bus directly affects the performance of this subsystem. Also, the motherboard needs to keep the graphics card well fed with data from both the processor and the memory.

Though one can argue that the results

motherboards has no match when it comes to gaming. The raw power of the GeForce3 is unleashed with the Gigabyte GA-8ITXE (Intel 850MD chipset) scoring a mind-bending 361.8 fps in *Quake III Arena*. The original Intel D850MD is not to be left too far behind; it scored 357.1 fps and even managed to exact some revenge in 3DMark 2001, where it scored 7476 as compared to the 7371 posted by the Gigabyte board.

The next best solution was the Intel 845D-based MSI 845 Ultra-C with DDR memory that put up a very respectable score of 336.4 fps. The gap in perform-



ance still exists, but it has been narrowed down significantly, as one can see in the 3DMark 2001 test where the MSI board actually beat the Gigabyte with a score of 7382 3DMarks.

The fact that not even a single SDRAM-based board could come close to the magical figure of 300 fps clearly shows how the graphics subsystem is affected by lack of memory bandwidth. The fastest in SDRAM board was the Intel D845WN, which trailed far behind the performance leaders with just 260.5 fps.

Athlon XP/Duron: The nForce 420-D-based ASUS A7N266-E really shines with a wonderful 308.1 fps in *Quake III Arena*. It was followed by the ASUS A7V266-E which generated 302.3 fps. No other board managed to cross the 300 fps barrier, though the DFI AD73Pro came very close at 297 fps. In the 3DMark 2001 test the A7N266-E scored a remarkable 7508 3DMarks, which outperforms even the Pentium 4 and RDRAM combo!

Pentium III/Celeron (Tualatin): Here the Pentium III platform clearly shows its age. The slow speed SDRAM doesn't allow the GeForce3 to stretch its legs and it gets heavily bottlenecked. The top score that was achieved in *Quake III Arena* was a paltry 204.5 fps by the ASUS TUSL2-M. The 3DMark score also languished at a lowly 5862 compared to the 7000+ 3DMarks achieved by several DDR and RDRAM boards in this test.

System-wide performance

This test allows you to get a clearer picture of a motherboard's impact on overall performance by testing how each subsystem interacts with each other.

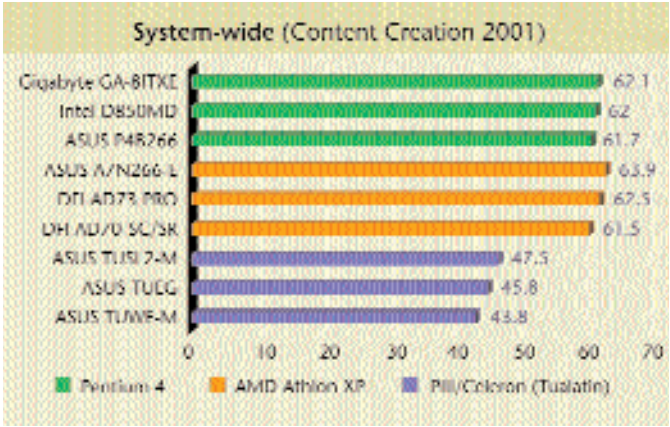
Content Creation Winstone 2001 (CCWS) and Business Winstone 2001 are

the most popular system-wide benchmarks because they touch all aspects of everyday computing. Both of them use an extensive set of applications that test the subsystems simultaneously—with the exception of the graphics subsystem which is not really stressed. Video encoding is another CPU,

memory and disk intensive benchmark that provides a good measure of your system's real world performance.

Pentium 4: From these tests, it's once again very clear that RDRAM powered boards are unmatched. The Gigabyte GA-8ITXE scores 62.1 in CCWS, winning by a hair's breadth over the Intel D850MD, which scores 62.0. It finished the video encoding sequence in a blazing 111 seconds with the Intel board taking just one second longer.

The top DDR board was the ASUS →



P4B266 which scored 61.7 in CCWS and finished the video encoding sequence in 116 seconds. This performance was matched by both the MSI 845 Ultra-C and the MSI 845 Ultra-ARU. Though they had lower scores in CCWS (59.1 and 60.4 respectively) they were still ahead of the fastest SDRAM board—the Mercury KOB845NFSX which scored 58.1 in CCWS. This board took an entire 131 seconds to complete the video encoding sequence!

Athlon XP/Duron: The nForce 420-D-based ASUS A7N266-E (using DDR memory) beat the fastest Pentium 4 solution in the CCWS test with an amazing score of 63.9 and then finished the video encoding test in 106 seconds flat. The DFI AD73Pro came in second scoring 62.5 in CCWS and took around 110 seconds to finish encoding the test video.

Pentium III/Celeron (Tualatin): As we've observed in the previous tests, the

chipsets, the scores obtained with motherboards from different manufacturers varied considerably. While this might seem confusing, the reason is actually pretty simple. This difference in performance can be attributed to tweaking (or slightly bending the rules) on the part of certain manufacturers who increase the FSB frequency beyond the prescribed 100/133 MHz. Doing this to a small degree (up to 101.6 MHz or 134.6 MHz) is perfectly fine if the board uses higher quality components with greater tolerances. However, it's akin to overclocking and the manufacturers who choose to do this gain a performance edge over the competition.

Features that matter!

While two motherboards might appear similar in features offered on the surface, digging deeper brings a lot of differences to light. You need to remember that these

ASUS TUSL2-M ends up dominating this category once again by scoring 47.5 in CCWS and then finishing the video encoding sequence in 154 seconds. All the other SDRAM boards trailed far behind.

Despite using the same processor and sometimes even the same

features have a direct or indirect impact on overall system performance. All motherboards now come with a standard set of features such as two USB 1.1 ports, two DIMM slots, ATA-100 support and the like.

There are a few motherboards that incorporate cutting-edge features that set them apart from the competition. The MSI KT3 Ultra-ARU board uses the KT333 chipset and has native support for DDR333 memory and ATA-133 drives. It features an onboard IDE RAID controller (Promise 2076), which supports both RAID 0 and RAID 1. The packaging and presentation of this motherboard is also outstanding. With a total of eight USB ports, four for USB 2.0 and four for USB 1.1, along with a separate SPDIF S-bracket and a detailed manual, there is little that MSI does wrong. Add to this its plethora of overclocking options available in the BIOS and you have a motherboard that is truly built for the enthusiast!

Not to be left far behind are the ASUS P4B266 and the MSI 845 Ultra-ARU. These were the most feature rich Pentium 4 boards and incorporated some really nifty features such as integrated six-channel audio. MSI's ARU (Audio/RAID/USB) versions of its motherboards seem to have every single feature that you'll ever need.

But in the end, the motherboard that truly takes the cake is the ASUS A7V333. Along with goodies like USB 2.0, RAID support, six-channel audio and ATA-133 support, it also comes with an IEEE 1394

Big value! Integrated Chipset

Not everyone needs a GeForce3 graphics card along with a 1 GHz+ processor. Motherboards with integrated chipsets, though considered low performing, satisfy a very important bracket of the computing pie—pure productivity. These are the Maruti 800s of the motherboard world; they run well, support most of the major features and, more importantly, perform decently.

This market was earlier dominated by SiS, ALi and VIA to a certain extent. The SiS 630 series has been quite popular but the current favourite is the 810 series for the Intel Pentium III processors.

Motherboards built on this rather tried and tested chipset are still being manufac-

tured and now support the latest Tualatin processors in their 810E2 avatar. We received a fair number of boards based on this revised chipset with some of them performing well in the office productivity benchmarks.

The ASUS TUWE-M is based on this chipset and its performance is noteworthy in the graphics and disk subsystem tests where it outshone the SiS 630ET chipset-based ASUS TUSI-M and the 810-based Mercury KOB 810E TFSX. Since there is no AGP slot on these motherboards, all benchmarks were run using the onboard VGA with the default BIOS settings. The performance drop in the graphics department is tremendous but if you are not

interested in gaming and are looking for pure functionality, then these boards fit like a glove.

There are a fair number of boards available for the AMD platform too, like the VIA ProSavage KM133A and VIA KLE133. These boards have the Savage4 AGP integrated into the board and provide pretty decent graphics performance. Another fine example is the Krypton M7VKS (using the KM133A), which outperforms the DFI AM33-EC, Gigabyte GA-7VMM and Soltek SL-75LIV, all of which are based on the VIA KLE133 integrated chipset.

None of the Pentium 4 motherboards that we received had integrated audio and video.

(FireWire) port. The BIOS and the over-clocking options integrated into this board are a piece of art and few other motherboards have such customised BIOSes which are so easy to use.

What it all leads to...

This comparison test featured a gamut of chipsets and memory options—from Plain Jane motherboards to feature-packed performance power houses. There are lots of choices for every single type of mainstream processor and this test can be used to analyse how systems based on different processor/memory combinations would perform.

Pentium 4: If you want the maximum performance out of the Pentium 4, without giving much thought to the price, you have little choice but to opt for an RDRAM board. The **Gigabyte GA-8ITXE** came in trumps here; it even beat Intel's very own D850MD and is attractively priced as well. The DDR SDRAM boards performed admirably and the MSI 845 Ultra-ARU, ULTRA-C, ASUS P4B266 and Intel's D845BG are great DDR solutions. Nevertheless, they failed to dislodge the Gigabyte GA-8ITXE from the top spot. The DDR boards get severely hammered by their RDRAM counterparts in memory bandwidth-intensive applications like *Quake III Arena*, where they lose by a margin of about 20 per cent!

The Best Value Award goes to the **HIS P4M266 (M50-12)** board. This SDRAM board steadily chugged away in all our tests and offers the Pentium 4 solution at an unbelievably low price point. This board narrowly edged out the **Kranion KP1M845** (based on the Intel 845 SDRAM chipset) showing that the VIA P4M266 chipset is no pushover and performs pretty well when compared with the 845 SDRAM chipset.

Athlon XP/Duron: The battle for the performance crown in this category was cut-throat and the legendary **ASUS A7V266-E** came out victorious. It beat the MSI KT3 Ultra-ARU and the promising Soltek SL75DRV4 by a fair margin and is truly the board to have if you intend to push your Athlon XP to the max!

The SDRAM based boards are simply too slow for the faster Athlon XP processors and it's highly recommended to adopt a DDR solution on the lines of the VIA KT266A/KT333.

But if you are in the market for a real-

ly low-cost board for a Duron or a lower speed Athlon, then take a close look at the **Krypton M7VKS**. This board is based on the VIA Apollo Pro Savage KM133A chipset and costs only Rs 3,480. This price is tough to match and it's our Best Value winner.

Pentium III/Celeron (Tualatin): The Intel 815EP-based **ASUS TUSL2-M** has no peers here. It beat all the other boards hollow and is by far the most attractive platform for a new Tualatin processor.

The ultimate value proposition are the Intel 810E2 chipset-based motherboards with their integrated audio and video, and they allow for some really inexpensive systems. Once again an ASUS board takes the top honours here—the **TUWE-M** retails for only Rs 4,200 and its performance is not too shabby.

WINNERS!

Gigabyte GA-8ITXE

This is one of the best RDRAM-based boards you can buy. It performed brilliantly in *Quake III Arena*, churning out a whopping 361.8 fps. The GA-8ITXE fea-



Gigabyte GA-8ITXE: Brilliant combination of features and performance at a great price

tures a great number of overclocking options in the BIOS and even has onboard Ethernet support using the Realtek chip. It comes with a DualBIOS feature, which kicks in if the primary BIOS gets corrupted. The GA-8ITXE also includes EasyTune III, a nifty utility that allows for easy overclocking of the FSB within Windows itself.

The layout of this board is quite compact which makes installation a trifle difficult. The board ships with two C-RIMM terminators that can be used to terminate

Features that Count... and Others that don't

✓ **Overclocking made easy:** The Red-Storm Overclocking utility provided on Soltek boards is amazingly simple. It calculates the maximum extent to which a system can be overclocked without compromising on stability.

✓ **On-board Dolby Digital support:** An astounding feature found only in the nForce 420-D based motherboards (like the ASUS A7N266-E), it saves you the hassles of investing in an expensive add-on sound card to enjoy high-quality surround sound.

✓ **Integrated Ethernet:** One feature that almost every manufacturer should provide because it is relatively easy to integrate and involves little or no CPU utilisation. Intel is the only manufacturer that currently integrates Ethernet support in all its motherboards.

✗ **Audio Modem Riser (AMR):** Integrates a low cost software modem onto the motherboard but the modem riser cards are hard to find and can cost as much as an internal PCI modem.

✗ **Integrated RAID support (Redundant Array of Inexpensive Disks):** While this feature promises to double the IDE transfer rates, the catch is that it functions only if you have two drives with identical characteristics and preferably from the same manufacturer. This limitation reduces its usefulness considerably.










✗ **Dual channel DDR support:** This technology can theoretically double the memory bandwidth, enabling AMD processors to outperform the Pentium 4/RDRAM combination. Unfortunately, it doesn't seem to work too well and the Athlon XP doesn't show any significant gains in real-world performance.

unpopulated RDRAM slots.












Our Verdict: The board is a great buy for performance enthusiasts and avid gamers.

HIS P4M266 (M50-12)

This board is an inexpensive Micro-ATX motherboard that uses the VIA P4M266 SDRAM chipset. Its performance was pretty decent with one of the best scores in the SDRAM category. In the SiSoft Sandra Drive Index, it notched an impressive score of 27395 points, and scored 5173 in the PCMark 2002 CPU Index.

| Memory type | SDRAM | | | | | | | |
|---|---|--|--|--|---|---|---|---|
| Chipset used | VIA KT133A | VIA Apollo Pro Savage KM133A | | | | | VIA KLE133 | |
| Product name | Gigabyte GA-7ZXR | ASUS A7V133-VM | DFI AM75-TC | Gigabyte GA-7ZMMH | Krypton M7VKS |  MSI MS-6340M | DFI AM33-EC | Gigabyte GA-7VMM |
| FEATURES | | | | | | | | |
| Fastest CPU supported | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ |
| No. of DIMM slots | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| No. of PCI slots | 6 | 5 | 6 | 6 | 3 | 5 | 5 | 5 |
| Integrated six-channel audio | No | No | No | No | No | No | No | No |
| No. of USB ports/ USB 2.0 support | 4/No | 4/No | 4/No | 2/No | 2/No | 2/No | 4/No | 2/No |
| Onboard Ethernet | No | No | No | No | No | No | No | No |
| No. of IDE channels | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BIOS overclocking (Vcore Adj./ FSB Adj.) | Y/Y | Y/Y | Y/Y | Y/Y | N/Y | Y/Y | Y/Y | Y/Y |
| Package contents (including software) | User manual; FDD/HDD cable; 2 extra USB ports; driver CD including NAV and Norton Personal Firewall and Easy Tune III | 1 Software & Driver CD/ VIA Integrated 4-in-1 Driver, 3D Audio Driver for Windows, ASUS PC Probe | HDD/FDD cable; 2 USB ports; driver CD, PC-Cillin 2000, VIA service pack, VGA drivers and user manual | FDD/HDD cable; user manual; driver CD including NAV, Norton Personal Firewall 2002, EasyTune III | FDD/HDD cables; driver CD including Norton Ghost and NAV | FDD/HDD cable; user manual; driver CD including PC-Cillin Anti-virus | FDD/HDD cables; 2 extra USB ports; driver CD | FDD/HDD cable; user manual; driver CD including NAV, Norton Personal Firewall and Easy Tune III |
| PERFORMANCE | | | | | | | | |
| Graphics subsystem | | | | | | | | |
| Quake III Arena (Normal, High, Max) (fps) | 237.3, 229.2, 176.6 | 216.1, 214.1, 164.9 | 224.2, 223.2, 165.9 | 238.4, 223.4, 176.4 | 22.7, 12.1, 4.1* | 229.4, 230, 175.3 | 19.9, 10.3, 5.4* | 22.8, 12.2, 4.1* |
| 3DMark 2001SE (3DMarks) | 6552 | 6255 | 6200 | 6528 | 291* | 6502 | 1846* | 1944* |
| Memory subsystem | | | | | | | | |
| PCMark 2002 (Memory Index) | 2496 | 2372 | 2355 | 2504 | 1953 | 2454 | Failed | Failed |
| SiSoft Memory (ALU, FPU) | 1029, 1016 | 895, 859 | 1061, 983 | 1028, 1015 | 797, 785 | 1026, 1009 | 779, 759 | 799, 787 |
| Disk subsystem | | | | | | | | |
| SiSoft Sandra (Drive Index) | 25140 | 16225 | 26134 | 14701 | 26016 | 14479 | 23695 | 23893 |
| PCMark 2002 (Disk Index) | 852 | 971 | 957 | 665 | 849 | 695 | 931 | 826 |
| HDTach: Read Burst Speed (MBps) | 62.5 | 47.4 | 65.1 | 28.1 | 67.1 | 28.4 | 69.6 | 66.6 |
| System-wide benchmark | | | | | | | | |
| Video Encoding (time in seconds) | 127 | 148 | 139 | 129 | 141 | 129 | 154 | 142 |
| Content Creation 2002 Index | 56.2 | 55.2 | 55.8 | 53.6 | 53.9 | 54.7 | 54.2 | 54.1 |
| Business Winstone 2002 Index | 56.6 | 55 | 57 | 55.5 | 53.6 | 55.3 | 53.6 | 54.2 |
| Processor subsystem | | | | | | | | |
| SiSoft Normal (Dhrystone/Whetstone) | 4607, 2308 | 4608, 2308 | 4591, 2308 | 4592, 2308 | 4596, 2311 | 4590, 2307 | 4601, 2304 | 4596, 2311 |
| SiSoft Multimedia (Integer/FPU) | 9134, 11331 | 9136, 10598 | 9133, 10594 | 9136, 10598 | 9147, 10610 | 9131, 10529 | 9121, 10580 | 9145, 10609 |
| PCMark 2002 (CPU Index) | 4663 | 4699 | 4728 | 4725 | 4360 | 4722 | 4594 | 4643 |
| OVERALL SCORE | | | | | | | | |
| Performance score (50%) | 30.59 | 27.22 | 30.32 | 26.80 | 26.13 | 26.53 | 25.62 | 25.78 |
| Features score (20%) | 10 | 6 | 9 | 9 | 5 | 5 | 5 | 5 |
| Value for money (20%) | 14.66 | 9.55 | 14.7 | 12.56 | 17.89 | 12.26 | 15.94 | 14.48 |
| Support/Warranty (10%) | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 7 |
| Overall product rating |  |  |  |  |  |  |  |  |
| Vendor name | Visualan Technologies P Ltd | Zeta Technologies | Zeta Technologies | Visualan Technologies P. Ltd | Priya Limited | Priya Limited | Zeta Technologies | Visualan Technologies P Ltd |
| Phone/Fax | 022-8202688 | 022-4102288 | 022-4102288 | 022-8202688 | 022-2663611 | 022-2663611 | 022-4102288 | 022-8202688 |
| E-mail | sales@visualanindia.com | sales@zetaindia.com | sales@zetaindia.com | sales@visualanindia.com | jain@priya-group.com | jain@priyagroup.com | sales@zetaindia.com | sales@visualanindia.com |
| Price (in Rs) | 5,400 | 6,950 | 5,350 | 5,700 | 3,480 | 5,140 | 3,795 | 4,250 |

* Using onboard graphics subsystem

| | DDR SDRAM | | | | | | | | |
|--|---|---|--|---|---|---|---|--|--|
| | VIA KT333 | | nForce 420-D | SIS 735 |  | VIA KT266A | | | |
| Soltek SL-75LIV | ASUS A7V333 | MSI KT3 Ultra-ARU | ASUS A7N266-E | ECS K7S5A | ASUS A7V266-E | DFI AD70-SC/SR | DFI AD73 PRO | MSI K7T266 Pro2 | Soltek SL-75DRV4 |
| | | | | | | | | | |
| XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ | XP 2000+ |
| 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 |
| No | Yes | Yes | Yes | No | Yes | No | No | No | No |
| 4/No | 4/Yes | 4/No | 4/Yes | 2/No | 4/No | 4/No | 4/No | 4/No | 4/No |
| No | No | No | No | No | No | No | No | No | No |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Y/Y | Y/Y | Y/Y | Y/Y | N/Y | Y/Y | Y/Y | Y/Y | Y/Y | Y/Y |
| Driver CD including TREND MICRO PC-Cillin 2000, PowerQuest Drive Image, Partition-Magic, FAR STONE Virtual Drive | FDD/HDD cable; bracket for USB 2.0 and FireWire Port; back plate; user manual, quick reference guide; driver CD | HDD/FDD cable; 6 extra USB ports; 6-channel audio connectors; 2 manuals (RAID + user manual); driver CD; RAID driver floppy | 2 extra USB ports; 6-channel audio riser card; 2 game CDs; driver CD including Cyberlink Video, ASUS Probe, PC-Cillin Anti-virus | FDD/HDD cable; user manual; driver CD | 2 additional USB port connectors; Quick Setup guide; user manual; driver CD | IDE/FDD cable; 2 USB connectors; 2 manuals (setup + RAID); RAID driver floppy; utility CD | IDE/FDD cable; 2 USB connectors; setup manual; utility CD | FDD/HDD cable; 2 additional USB ports; user manual; driver CD including PC-Cillin Anti-virus | driver CD including TREND MICRO PC-Cillin 2000, PowerQuest Drive Image, Partition-Magic, FAR STONE Virtual Drive |
| | | | | | | | | | |
| 20.4, 10.3, 3.2* | 293.4, 270.9, 183.8 | 281.1, 264.8, 183.2 | 308.1, 269.1, 160.6 | 270, 262.1, 182 | 302.3, 276.5, 183.4 | 294.9, 276.1, 183 | 297, 277.8, 183 | 281.1, 262.1, 182.1 | 281.3, 260.6, 180.9 |
| Failed* | 7351 | 7210 | 7508 | 7086 | 7379 | 7339 | 7393 | 7210 | 7210 |
| | | | | | | | | | |
| Failed | 3221 | 3077 | 3349 | 2792 | 3167 | 3262 | 3274 | 3130 | 3130 |
| | | | | | | | | | |
| 784, 761 | 2008, 1865 | 1899, 1756 | 1881, 1820 | 1786, 1672 | 2037, 1888 | 1995, 1883 | 2002, 1887 | 1969, 1812 | 1961, 1825 |
| | | | | | | | | | |
| 13914 | 26551 | 26196 | 26402 | 26452 | 26063 | 25908 | 25184 | 25266 | 13274 |
| Failed | 993 | 996 | 988 | 1023 | 1000 | 994 | 1036 | 1033 | 636 |
| | | | | | | | | | |
| 28 | 70 | 69.4 | 70 | 70.6 | 70.2 | 70.4 | 69.4 | 70.4 | 28.6 |
| | | | | | | | | | |
| Failed | 111 | 112 | 106 | 110 | 110 | 110 | 110 | 109 | 114 |
| | | | | | | | | | |
| Failed | 58 | 60.8 | 63.9 | 59.6 | 61.3 | 61.5 | 62.5 | 60.1 | 58.9 |
| | | | | | | | | | |
| Failed | 57.1 | 58.7 | 58.3 | 57.1 | 59.3 | 60.5 | 59.5 | 58.8 | 57.1 |
| | | | | | | | | | |
| 4611, 2318 | 4608, 2307 | 4606, 2303 | 4607, 2316 | 4597, 2291 | 4642, 2326 | 4585, 2304 | 4592, 2310 | 4590, 2308 | 4627, 2317 |
| | | | | | | | | | |
| 9175, 10643 | 9132, 10594 | 9115, 10574 | 9167, 10633 | 9110, 10566 | 9204, 10676 | 9121, 10581 | 9141, 10539 | 9136, 10595 | 9210, 10620 |
| | | | | | | | | | |
| Failed | 4904 | 4850 | 5006 | 4763 | 4957 | 4908 | 4925 | 4871 | 4630 |
| | | | | | | | | | |
| 13.91 | 34.29 | 33.96 | 34.78 | 33.33 | 34.80 | 34.62 | 34.50 | 34.06 | 29.73 |
| | | | | | | | | | |
| 7 | 16 | 11 | 10 | 5 | 11 | 8 | 6 | 7 | 8 |
| 10.86 | 6.48 | 9.05 | 5.99 | 13.93 | 6.4 | 10.33 | 13.61 | 14.15 | 11.52 |
| 7 | 7 | 7 | 7 | 5 | 7 | 7 | 7 | 7 | 7 |
|  |  |  |  |  |  |  |  |  |  |
| Yogi Comp | Rashi Peripherals | Priya Limited | Zeta Technologies | Cerebra Computers | Zeta Technologies | Zeta Technologies | Zeta Technologies | Priya Limited | Yogi Comp |
| 022-8806582 | 022-8260258 | 022-2663611 | 022-4102288 | 080-3474934 | 022-4102288 | 022-4102288 | 022-4102288 | 022-2663611 | 022-8806582 |
| yogicomp@netracker.com | ho@rptechindia.com | jain@priya-group.com | sales@zetaindia.com | gururaj@cerebra-computers.com | sales@zetaindia.com | sales@zetaindia.com | sales@zetaindia.com | jain@priya-group.com | yogicomp@netracker.com |
| 3,850 | 15,500 | 9,925 | 13,950 | 5,500 | 9,950 | 8,250 | 5,950 | 5,800 | 6,550 |

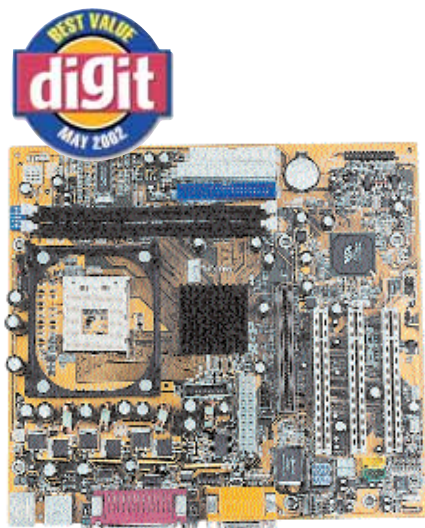
| Memory type | SDRAM | | | | | |
|---|--|--|---|--|---|---|
| Chipset used | SiS 630ET | | Intel 810E2 | | Intel 815EG | Intel 815EP |
| Product name | ASUS TUSI-M | ASUS TUWE-M | KOB 810E TFSX | Vesta IM-VMBO-108/9 | ASUS TUEG | ASUS TUSL2-M |
| FEATURES | | | | | | |
| Fastest CPU supported | P-III and Celeron (Tualatin) | P-III and Celeron (Tualatin) | P-III and Celeron (Tualatin) | P-III and Celeron (Tualatin) | P-III and Celeron (Tualatin) | P-III and Celeron (Tualatin) |
| No. of DIMM slots | 3 | 2 | 2 | 2 | 3 | 3 |
| No. of PCI slots | 3 | 3 | 3 | 3 | 5 | 3 |
| Integrated six-channel audio | No | No | No | No | No | No |
| No. of USB ports/USB 2.0 support | 4/No | 4/No | 2/No | 2/No | 4/No | 4/No |
| Onboard Ethernet | No | No | No | No | No | No |
| No. of IDE channels | 2 | 2 | 2 | 2 | 2 | 2 |
| BIOS overclocking (Vcore Adj./ FSB Adj.) | Y/Y | Y/Y | N/Y | N/Y | Y/Y | Y/Y |
| Package contents (including software) | FDD/HDD cable; user manual; driver CD including Trend PC-Cillin Anti-virus | FDD/HDD cable; 2 extra USB ports; user manual; driver CD including PC-Cillin Anti-virus, ASUS PC Probe | User manual; driver CD including PC-Cillin Anti-virus | FDD/HDD cable; user manual; Driver CD including PC-Cillin Anti-virus | FDD/HDD cable; 2 extra USB ports; user manual; driver CD including PC-Cillin Anti-virus | FDD/HDD cables; 2 extra USB ports; user manual; driver CD including ASUS probe and PC-Cillin Anti-virus |
| PERFORMANCE | | | | | | |
| Graphics subsystem | | | | | | |
| Quake III Arena (Normal, High, Max) (fps) | 39.1, 16, 7.1* | 39.1, 27.2, 16.1* | 23.5, 17.2, 9.2* | 46.7, 23.4, 14.1* | 39.3, 20.8, 11.5* | 204.5, 200.7, 158.3 |
| 3DMark 2001SE (3DMarks) | 318* | 541* | Failed* | 510* | 610* | 5862 |
| Memory subsystem | | | | | | |
| PCMark 2002 (Memory Index) | 1213 | 1273 | 1111 | 1140 | 1503 | 1973 |
| SiSoft Memory (ALU, FPU) | 467, 465 | 575, 572 | 512, 509 | 501, 498 | 724, 718 | 994, 984 |
| Disk subsystem | | | | | | |
| SiSoft (Drive Index) | 25501 | 26328 | 24262 | 20579 | 25767 | 25945 |
| PC Mark 2002 (Disk Index) | 941 | 973 | 668 | 826 | 826 | 960 |
| HDTach: Read Burst Speed (MBps) | 64.7 | 70.6 | 58.2 | 51.7 | 71.8 | 70.2 |
| System-wide benchmark | | | | | | |
| Video Encoding (time in seconds) | 187 | 193 | 201 | 200 | 169 | 154 |
| Content Creation 2001 Index | 43.6 | 43.8 | 27.2 | 41.7 | 45.8 | 47.5 |
| Business Winstone 2001 Index | 41.3 | 40.2 | 27.7 | 39.1 | 47.2 | 45.6 |
| Processor subsystem | | | | | | |
| SiSoft Normal (Dhrystone/Whetstone) | 3015, 1469 | 3135, 1524 | 3117, 1518 | 3114, 1516 | 3140, 1529 | 3137, 1527 |
| SiSoft Multimedia (Integer/FPU) | 5961, 7399 | 6198, 7694 | 6164, 7651 | 6156, 7641 | 6207, 7705 | 6202, 7699 |
| PCMark 2002 (CPU Index) | 3229 | 3344 | 3218 | 3169 | 3415 | 3527 |
| OVERALL SCORE | | | | | | |
| Performance score (50%) | 20.74 | 23.29 | 18.58 | 19.12 | 25.55 | 26.51 |
| Features score (20%) | 6 | 7 | 5 | 2 | 7 | 8 |
| Value for money (20%) | 13.53 | 17.61 | 13.47 | 12.8 | 8.13 | 10.3 |
| Support/Warranty (10%) | 7 | 7 | 5 | 5 | 7 | 7 |
| Overall product rating | B- | B+ | C+ | C- | B- | B |
| Vendor name | Zeta Technologies | Zeta Technologies | Visualan Technologies Pvt Ltd | Ingram Micro India | Zeta Technologies | Zeta Technologies |
| Phone/Fax | 022-4102288 | 022-4102288 | 022-8202688 | 080-5550599 | 022-4102288 | 022-4102288 |
| E-mail | sales@zetaindia.com | sales@zetaindia.com | sales@visualanindia.com | sanjay.peer@ingram-micro.co.in | sales@zetaindia.com | sales@zetaindia.com |
| Price (in Rs) | 3,950 | 4,200 | 3,500 | 3,300 | 8,000 | 6,700 |

* Using onboard graphics subsystem



Motherboards for Intel Pentium 4 Processors

| Memory type | SDRAM | | | | | | | |
|--|---|--|--|---|--|--|--|--|
| Chipset used | Intel 845 | | | | | | | |
| Product name | ASUS P4B | DFI NB32-SC/SL | Gigabyte GA-8IDML | Intel D845WN | Kranion KP1M845 | Krypton M7TDB | Mercury KOB845NFSX | Vesta V845SF |
| FEATURES | | | | | | | | |
| Fastest CPU supported | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ |
| No. of DIMM/RIMM slots | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 |
| No. of PCI slots | 6 | 5 | 5 | 6 | 3 | 6 | 6 | 3 |
| Integrated 6-channel audio | No | No | No | No | No | No | No | No |
| No. of USB ports/ USB 2.0 support | 4/No | 4/No | 2/No | 2/No | 2/No | 2/No | 2/No | 2/No |
| Onboard Ethernet | No | No | No | Yes | No | No | No | No |
| No. of IDE channels | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BIOS overclocking (Vcore Adj./ FSB Adj.) | Y/Y | Y/Y | Y/Y | N/N | N/Y | N/Y | N/Y | N/Y |
| Package contents (including software) | HDD/FDD cable; jumpers; 2 USB and SPDIF Out connector; manuals (Quick Setup and user manual); CD containing drivers, PC Probe, ASUS Live-Update Utility Cyberlink Power-Player; VideoLive Mail Trend Micro, PC-Cillin 2000 Anti-virus | FDD/HDD cable; 2 USB ports; driver CD including Hardware Doctor for Windows, Promise RAID driver/utility for Windows | HDD cable; back plate for cabinet; user manual; driver CD including NAV, Easy Tune III Overclock utility | FDD/HDD cable; back plate; driver CD including NTI CD Maker, Norton Internet Security, and Intel Active Monitor | FDD/HDD cable; user manual; drivers CD | HDD/FDD cable; user manual + board layout chart; CD containing drivers, NAV and Norton Ghost | FDD/HDD cable; user manual; drivers CD containing PC-Cillin Anti-virus | FDD/HDD cable; user manual; driver CD including PC-Cillin Anti-virus |
| PERFORMANCE | | | | | | | | |
| Graphics subsystem | | | | | | | | |
| Quake III Arena (Normal, High,Max) (fps) | 226.2, 218.9, 169.9 | 256.4, 246.1, 177.4 | 259.3, 248.3, 178 | 260.5, 245.3, 176.6 | 256.8, 243.9, 176.1 | 251.8, 246.5, 176.2 | 255.3, 249.4, 177.5 | 250.6, 236.6, 159.4 |
| 3DMark 2001SE (3D Marks) | 6298 | 6683 | 6699 | 6692 | 6701 | 6690 | 6735 | 6460 |
| Memory subsystem | | | | | | | | |
| PCMark 2002 (Memory Index) | 2553 | 3257 | 3076 | 3042 | 3356 | 3073 | 3334 | 3121 |
| SiSoft Memory (ALU, FPU) | 746, 744 | 985, 968 | 988, 970 | 974, 943 | 978, 948 | 978, 778 | 1000, 968 | 986, 937 |
| Disk subsystem | | | | | | | | |
| SiSoft Sandra (Drive Index) | 25590 | 24773 | 26639 | 25935 | 26936 | 26480 | 25863 | 27488 |
| PCMark 2002 (Disk Index) | 867 | 908 | 873 | 885 | 914 | 972 | 911 | 979 |
| HDTach: Read Burst Speed (MBps) | 69 | 69.8 | 68.1 | 61.9 | 62.1 | 70.6 | 69 | 68.9 |
| System-wide benchmark | | | | | | | | |
| Video Encoding (time in secs) | 145 | 138 | 133 | 134 | 133 | 132 | 131 | 135 |
| Content Creation 2001 Index | 57.1 | 58 | 58.1 | 57.6 | 57.7 | 57.2 | 58.1 | 56.6 |
| Business Winstone 2001 Index | 56.8 | 51.4 | 57.2 | 57.2 | 57.3 | 55.5 | 57.9 | 55.8 |
| Processor subsystem | | | | | | | | |
| SiSoft Normal (Dhrystone/ Whetstone) | 4151, 2712 | 4112, 2682 | 4118, 2685 | 4112, 2678 | 4106, 2683 | 4115, 2686 | 4174, 2711 | 4114, 2685 |
| SiSoft Multimedia(Integer/FPU) | 8767, 10649 | 8682, 10555 | 8695, 10593 | 8678, 10564 | 8683, 10558 | 8697, 10594 | 8769, 10693 | 8689, 10594 |
| PCMark 2002 (CPU Index) | 5108 | 5178 | 5193 | 5164 | 5183 | 5187 | 5233 | 5168 |
| OVERALL SCORE | | | | | | | | |
| Performance score (50%) | 30.36 | 31.30 | 31.87 | 31.34 | 31.73 | 31.64 | 32.12 | 31.65 |
| Features score (20%) | 11 | 7 | 4 | 10 | 5 | 9 | 7 | 4 |
| Value for money (20%) | 10.88 | 13.2 | 11.47 | 9.87 | 15.96 | 13.1 | 13.26 | 13.45 |
| Support/Warranty (10%) | 7 | 7 | 7 | 10 | 5 | 5 | 5 | 5 |
| Overall product rating | | | | | | | | |
| Vendor name | Zeta Technologies | Zeta Technologies | Visualan Technologies P Ltd | Xpress Computers Ltd. | Cerebra Computers | Priya Limited | Visualan Technologies P. Ltd. | Ingram Micro India |
| Phone/Fax | 022-4102288 | 022-4102288 | 022-8202688 | 022-3852070 | 080-3474934 | 022-2663611 | 022-8202688 | 080-5550591 |
| E-mail | sales@zetaindia.com | sales@zetaindia.com | sales@visualanindia.com | sales@xpressindia.com | gururaj@cerebra-computers.com | jain@priya-group.com | sales@visualanindia.com | sanjay.peer@mmico.co.in |
| Price (in Rs) | 7,600 | 5,800 | 6,250 | 8,375 | 4,600 | 6,200 | 5,900 | 5,300 |



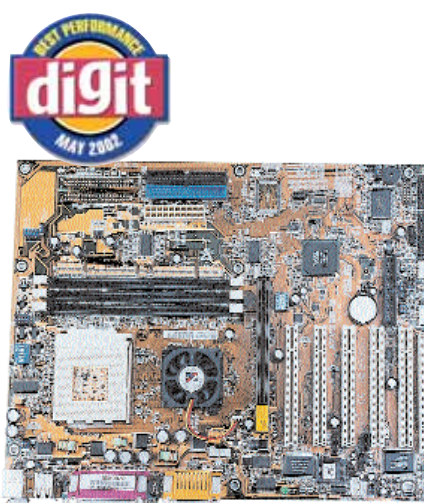
HIS P4M266 (M50-12): Plenty of bang for the buck in a small form factor

However, there are no bundled extras save the flash utility for upgrading the BIOS and a copy of PC-Cillin anti-virus software. The manual was very simple, listing only the main motherboard specifications. The CPU core voltage is set via DIP switches, which means you have to set them prior to installing the motherboard inside the cabinet.

Our Verdict: A great board if you want an inexpensive Pentium 4 SDRAM solution.

ASUS A7V266-E

This board from ASUS uses the VIA KT266A DDR chipset with support for the AMD Athlon Thunderbird, Athlon XP and Duron Socket-A processors. It features five PCI slots, an AGP Pro slot, which is rather rare, and supports up to 3 GB of memory. The onboard audio is capable of delivering HRTF 3D surround sound using the C-Media CMI8738 audio chip.



ASUS A7V266-E: Great performance with plenty of room for tweaking

The board is well laid out and there is a lot of space around the processor socket for attaching a bigger heat sink. Overclocking is controlled via the BIOS or by using the DIP switches provided on the board. The board comes with a detailed manual and a quick reference card, which is useful for the impatient enthusiasts. In our tests the board was very stable and provided some great results.

Our Verdict: Recommended for the performance enthusiasts; uses the tried and tested VIA KT266A chipset.

Krypton M7VKS

The M7VKS is a VIA KM133A-based board for Athlon XP processors using SDRAM. This board is a good solution for AMD processors as it scored fairly well in all our benchmarks. The motherboard includes integrated graphics (using the Trident Blade 3D chip) and



Krypton M7VKS: Unbeatable combination of features and price

does not feature an AGP slot. This makes it an ideal solution for low-cost Duron systems that don't need high-end graphics performance.

It features two DIMM slots and was the only motherboard that came with an ISA slot. The M7VKS has onboard sound, hardware monitoring for system temperature and fan speed, and comes in a Micro-ATX format.

Our Verdict: This board is a great option if you plan on buying a low-cost Duron or Athlon system.

ASUS TUSL2-M

The ASUS TUSL2-M uses the Intel 815EP chipset and is by far the best board for the Intel Tualatin processors, trashing every other board in its category. In *Quake III Arena* it managed a very commendable score of 206 fps when clubbed with a GeForce3 graphics card. It registered the highest score (in this category) in

New Technologies on the Horizon

Performance is going up across the board with the arrival of technologies like Serial ATA, which is set to replace the aged Parallel ATA interface in use today. Serial ATA, in its initial *avatar*, will run at a whopping 150 MBps, or almost twice as fast as standard ATA. Serial ATA will use more compact four-conductor cables than the 40/80-conductor cables in use today.

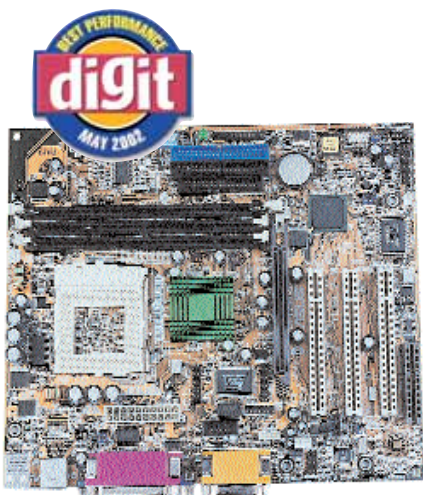
Memory technologies are set for a significant overhaul as DDR SDRAM will move to a much faster DDR II 400 (6.4 GBps theoretical bandwidth) and RDRAM will also move up from the current PC800 to PC1066, offering a whopping 4.5 GBps of effective bandwidth.

Next up is PCI-X, which takes the existing 32-bit PCI technology and moves it to 64-bits. This will lead to increases in both

throughput and clock speed. This pumped up PCI specification operates at speeds of up to 133 MHz (versus the current 33 MHz).

But topping all this is the AGP 8x standard, which will debut with the next generation of graphics cards and will run at 533 MHz. This makes even the GeForce 4 running at AGP 4x look pale in comparison.

| Decision Maker | | | |
|--------------------|---|--|--|
| | Bare Necessity Seeker | Computer Enthusiast | Performance Seeker |
| You need | Basic support for current processors and peripherals | Flexibility and upgradeability | Maximum performance and overclockability |
| Look for | Minimum 3 PCI slots with integrated sound and video in the Micro-ATX format | Minimum 5 PCI slots, 3 RAM slots, AGP 4x slot, ATX format, USB 2.0 support | Latest chipset, easy option for overclocking, stability when over-clocked, 6-channel audio support, RAID 0 and 1 |
| Our recommendation | Pentium III/Celeron ASUS TUWE-M, Mercury KOB810ETFSX, Athlon XP/Duron Krypton M7VKS Pentium 4 ASUS P4B, Mercury KOB845NFSX | Athlon XP/Duron MSI K7T266 Pro2, DFI AM75-TC, Soltek SL-75DRV4 Pentium 4 ASUS P4B266, MSI 845 Ultra-C | Athlon XP/Duron ASUS A7V266-E, MSI KT3 Ultra-ARU, ASUS A7N266-E Pentium 4 Gigabyte GA-8ITXE, Intel D850MD |
| Price range | Rs 3,500 - 5,500 | Rs 5,500 - 10,000 | Up to Rs 16,000 |



ASUS TUSL2-M: The ultimate performer for Pentium III processors

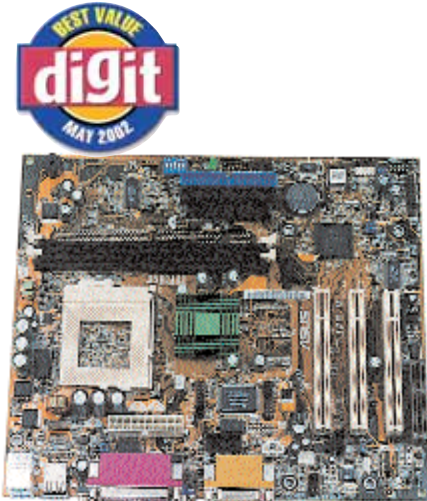
Content Creation Winstone 2001 with 47.5 points.

Despite being a Micro-ATX board, it still features an AGP slot — something we sorely missed on the 810E2 solutions. The three PC133 SDRAM DIMM slots support a maximum of 512 MB. The board also supports a smart card reader and has four USB ports.

Our Verdict: This board is an excellent platform for the Tualatin range of Pentium III processors.

ASUS TUWE-M

The layout of the TUWE-M is exactly the same as the TUSL2-M except that it uses the 810E2 chipset. This is a new revision



ASUS TUWE-M: Very robust performance at an affordable price

to the 810 series with support for the latest Pentium III and Celeron (Tualatin) processors. This board scored 26328 in SiSoft Sandra 2002 Drive Index, making it one of the fastest in its category.

The board does not have an AGP slot and you cannot improve its graphics performance by plugging in a faster AGP card. It comes with three PCI slots and features onboard audio. As it uses the Micro-ATX form factor, its upgrade path is limited, but its small size makes for very easy installation.

Our Verdict: This board is a good buy for those looking to build a low-cost Celeron system.

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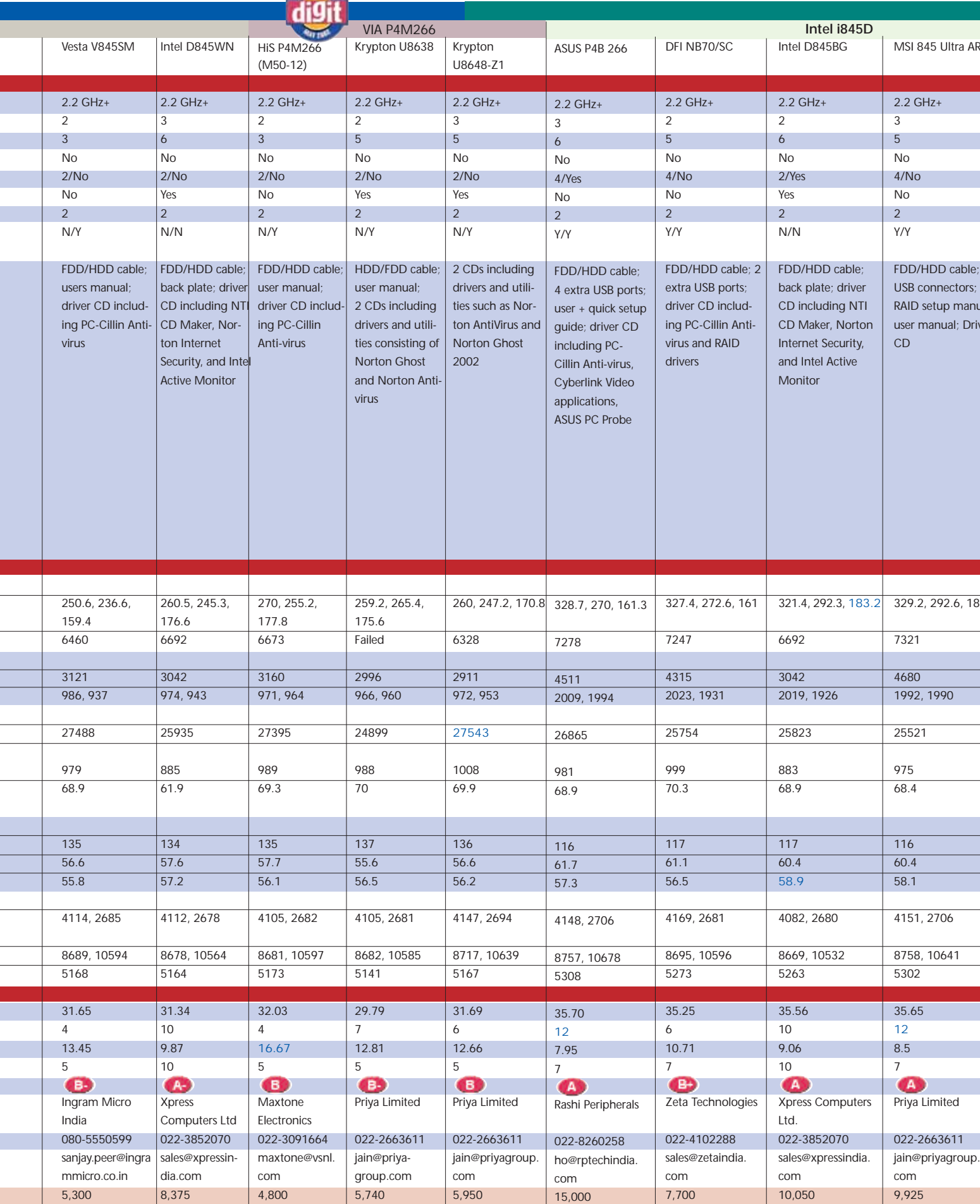
May 30, 2002





Motherboards for Intel Pentium 4 Processors

| Memory type | SDRAM | | | | | | |
|--|---|--|--|---|--|--|--|
| Chipset used | Intel 845 | | | | | | |
| Product name | ASUS P4B | DFI NB32-SC/SL | Gigabyte GA-8IDML | Intel D845WN | Kranion KP1M845 | Krypton M7TDB | Mercury KOB845NFSX |
| FEATURES | | | | | | | |
| Fastest CPU supported | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ |
| No. of DIMM/RIMM slots | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| No. of PCI slots | 6 | 5 | 5 | 6 | 3 | 6 | 6 |
| Integrated 6-channel audio | No | No | No | No | No | No | No |
| No. of USB ports/ USB 2.0 support | 4/No | 4/No | 2/No | 2/No | 2/No | 2/No | 2/No |
| Onboard Ethernet | No | No | No | Yes | No | No | No |
| No. of IDE channels | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BIOS overclocking (Vcore Adj./ FSB Adj.) | Y/Y | Y/Y | Y/Y | N/N | N/Y | N/Y | N/Y |
| Package contents (including software) | HDD/FDD cable; jumpers; 2 USB and SPDIF Out connector; manuals (Quick Setup and user manual); CD containing drivers, PC Probe, ASUS Live-Update Utility Cyberlink Power-Player; VideoLive Mail Trend Micro, PC-Cillin 2000 Anti-virus | FDD/HDD cable; 2 USB ports; driver CD including Hardware Doctor for Windows, Promise RAID driver/utility for Windows | HDD cable; back plate for cabinet; user manual; driver CD including NAV, Easy Tune III Overclock utility | FDD/HDD cable; back plate; driver CD including NTI CD Maker, Norton Internet Security, and Intel Active Monitor | FDD/HDD cable; user manual; drivers CD | HDD/FDD cable; user manual + board layout chart; CD containing drivers, NAV and Norton Ghost | FDD/HDD cable; user manual; drivers CD containing PC-Cillin Anti-virus |
| PERFORMANCE | | | | | | | |
| Graphics subsystem | | | | | | | |
| Quake III Arena (Normal, High,Max) (fps) | 226.2, 218.9, 169.9 | 256.4, 246.1, 177.4 | 259.3, 248.3, 178 | 260.5, 245.3, 176.6 | 256.8, 243.9, 176.1 | 251.8, 246.5, 176.2 | 255.3, 249.4, 177.5 |
| 3DMark 2001SE (3D Marks) | 6298 | 6683 | 6699 | 6692 | 6701 | 6690 | 6735 |
| Memory subsystem | | | | | | | |
| PCMark 2002 (Memory Index) | 2553 | 3257 | 3076 | 3042 | 3356 | 3073 | 3334 |
| SiSoft Memory (ALU, FPU) | 746, 744 | 985, 968 | 988, 970 | 974, 943 | 978, 948 | 978, 778 | 1000, 968 |
| Disk subsystem | | | | | | | |
| SiSoft Sandra (Drive Index) | 25590 | 24773 | 26639 | 25935 | 26936 | 26480 | 25863 |
| PCMark 2002 (Disk Index) | 867 | 908 | 873 | 885 | 914 | 972 | 911 |
| HDTach: Read Burst Speed (MBps) | 69 | 69.8 | 68.1 | 61.9 | 62.1 | 70.6 | 69 |
| System-wide benchmark | | | | | | | |
| Video Encoding (time in secs) | 145 | 138 | 133 | 134 | 133 | 132 | 131 |
| Content Creation 2001 Index | 57.1 | 58 | 58.1 | 57.6 | 57.7 | 57.2 | 58.1 |
| Business Winstone 2001 Index | 56.8 | 51.4 | 57.2 | 57.2 | 57.3 | 55.5 | 57.9 |
| Processor subsystem | | | | | | | |
| SiSoft Normal (Dhrystone/ Whetstone) | 4151, 2712 | 4112, 2682 | 4118, 2685 | 4112, 2678 | 4106, 2683 | 4115, 2686 | 4174, 2711 |
| SiSoft Multimedia(Integer/FPU) | 8767, 10649 | 8682, 10555 | 8695, 10593 | 8678, 10564 | 8683, 10558 | 8697, 10594 | 8769, 10693 |
| PCMark 2002 (CPU Index) | 5108 | 5178 | 5193 | 5164 | 5183 | 5187 | 5233 |
| OVERALL SCORE | | | | | | | |
| Performance score (50%) | 30.36 | 31.30 | 31.87 | 31.34 | 31.73 | 31.64 | 32.12 |
| Features score (20%) | 11 | 7 | 4 | 10 | 5 | 9 | 7 |
| Value for money (20%) | 10.88 | 13.2 | 11.47 | 9.87 | 15.96 | 13.1 | 13.26 |
| Support/Warranty (10%) | 7 | 7 | 7 | 10 | 5 | 5 | 5 |
| Overall product rating | | | | | | | |
| Vendor name | Zeta Technologies | Zeta Technologies | Visualan Technologies P Ltd | Xpress Computers Ltd. | Cerebra Computers | Priya Limited | Visualan Technologies P. Ltd. |
| Phone/Fax | 022-4102288 | 022-4102288 | 022-8202688 | 022-3852070 | 080-3474934 | 022-2663611 | 022-8202688 |
| E-mail | sales@zetaindia.com | sales@zetaindia.com | sales@visualanindia.com | sales@xpressindia.com | gururaj@cerebra-computers.com | jain@priya-group.com | sales@visualanindia.com |
| Price (in Rs) | 7,600 | 5,800 | 6,250 | 8,375 | 4,600 | 6,200 | 5,900 |





| DDR DRAM | | | | | RDRAM | |
|--|--|--|---|---------------------------------------|---|---|
| | SiS 650 | | SiS 645 | VIA P4M266A | Intel D850GB | Intel D850MD |
| MSI 845 Ultra-C | DFI NS35-SC | Gigabyte GA-8SMML | ASUS P4S333-VM | Jetway P4MFA | Gigabyte GA-8ITXE | Intel D850MD |
| | | | | | | |
| 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ | 2.2 GHz+ |
| 2 | 2 | 3 | 2 | 3 | 3 | 3 |
| 6 | 3 | 3 | 5 | 5 | 5 | 6 |
| No | No | No | No | No | No | No |
| 4/Yes | 4/No | 2/No | 4/No | 2/No | 4/Yes | 4/No |
| No | No | Yes | No | No | No | Yes |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Y/Y | Y/Y | Y/Y | Y/Y | N/Y | N/N | N/N |
| FDD/HDD cables; D-bracket for LED indicators along with 2 extra USB ports; driver CD including PC-Cillin Anti-virus and PC Alert | FDD/HDD cable; 2 extra USB ports; user manual; driver CD | HDD/FDD cable; back plate; user manual; CD containing NAV, Norton Personal Firewall, Easy Tune III | FDD/HDD cables; 2 extra USB ports; driver CD including Cyberlink video/audio applications, PC-Cillin Anti-virus, PC Probe and ASUS Liveupdate | HDD/FDD cable; user manual; driver CD | FDD/HDD cables; back plate; 2 extra ports; driver CD including NAV, Norton Personal Firewall, Easy Tune III | FDD/HDD cable; back plate; driver CD including NTI CD Maker, Norton Internet Security, and Intel Active Monitor |
| | | | | | | |
| 336.4, 297.1, 182.5 | 305.1, 272.1, 172.5 | 219.4, 198, 153.2 | 291.5, 265.4, 175.6 | 293.8, 273.3, 182.5 | 361.8, 274.8, 160.3 | 357.1, 305.3, 183 |
| 7382 | 6360 | 5896 | 6680 | 6772 | 7371 | 7476 |
| | | | | | | |
| 4246 | 4417 | 3249 | 4200 | 4101 | 5311 | 5213 |
| 2044, 1964 | 1790, 1844 | 927, 944 | 1809, 1869 | 1804, 1806 | 2519, 2520 | 2490, 2486 |
| | | | | | | |
| 26012 | 27276 | 26239 | 27039 | 22067 | 26977 | 26932 |
| | | | | | | |
| 982 | 985 | 971 | 1015 | 483 | 1002 | 897 |
| 70.3 | 69.8 | 70 | 70.5 | 69.7 | 72.3 | 67.4 |
| | | | | | | |
| 116 | 123 | 137 | 128 | 128 | 111 | 112 |
| 59.1 | 57.2 | 55 | 58.2 | 45.9 | 62.1 | 62 |
| 57.7 | 54.6 | 53 | 54.6 | 38.2 | 57.3 | 58.9 |
| | | | | | | |
| 3934, 2711 | 3851, 2615 | 3840, 2622 | 3882, 2653 | 4157, 2712 | 4170, 2696 | 4126, 2679 |
| 8779, 10713 | 8418, 10230 | 8416, 10244 | 8536, 10372 | 8766, 10688 | 8733, 10656 | 8673, 10545 |
| 5331 | 5071 | 5012 | 5141 | 5243 | 5307 | 5264 |
| | | | | | | |
| 33.96 | 34.32 | 30.66 | 34.28 | 32.13 | 37.60 | 37.41 |
| 8 | 2 | 8 | 7 | 5 | 9 | 9 |
| 11.76 | 11.26 | 12.47 | 11.87 | 11.42 | 12.85 | 8.96 |
| 7 | 7 | 7 | 7 | 5 | 7 | 10 |
| A- | B- | B+ | A- | B- | A- | A- |
| Priya Limited | Zeta Technologies | Visualan Technologies P Ltd | Rashi Peripherals | Rashi Peripherals | Visualan Technologies Pvt Ltd | Xpress Computers Ltd. |
| 022-2663611 | 022-4102288 | 022-8202688 | 022-8260258 | 022-8260258 | 022-8202688 | 022-3852070 |
| jain@priyagroup.com | sales@zetaindia.com | sales@visualanindia.com | ho@rptechindia.com | ho@rptechindia.com | sales@visualanindia.com | sales@xpressindia.com |
| 7,130 | 6,450 | 6,200 | 8,500 | 6,500 | 7,250 | 10,350 |



PHOTOGRAPH: Mexy Xavier
IMAGING: Neeta Wadiker

Design Duel

After months of expectations, both Quark and Adobe, fortified with their latest versions, are fighting it out in the desktop publishing market. Guess who's winning?

Ever since Adobe InDesign was released, Adobe and QuarkXPress have been engaged in the battle of one-upmanship. Both QuarkXPress 5.0 and InDesign 2.0 continue in the same mould as their preceding versions and enhance usability for designers. Both of them, with almost similar features, are nearly indistinguishable except for the interface. The ability to create tables, Web pages with style sheets intact, and support for transparent effects on images (InDesign only) are some of the new features that have been introduced. However, there are two more important things both these upgrades are aiming at: making layout software as easy to use as a word processor, and increasing the emphasis on Web management.

Round 1: Tables

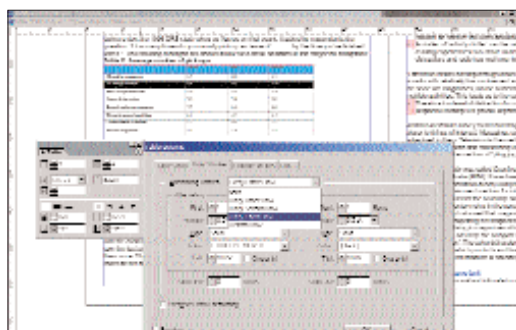
Any designer would tell you how much time is wasted in creating tables. Drawing grid lines and using tabbed text can be irritating at times and even a small

change in one row or column can change the text layout. But this is not so anymore in both Quark and InDesign. They come with inbuilt options for creating and importing tables.

InDesign offers more table options than Quark. You can split or merge cells and add diagonal lines, though you cannot fill text along the diagonal. InDesign seems to understand the designer's 'mentality' more, as one of the feature sets is

alternate shading or colouring of rows and columns (or every other two rows or columns). You have to select the row line or column line and format the same in Quark. Also, this software does not give border colour specifications at a cell level. The way the tables operate is different in both the software. In InDesign the row width expands to fill in the selection, while Quark overflows the text.

The superiority of InDesign is established once you try and import a table from an Excel spreadsheet or a Word table. It automatically recognises the cells in Word or Excel. Quark, on the other hand, doesn't import from Excel and tables in Word are imported as tab-delimited text which can be converted to tables using the Convert Text to Tables option. Even this doesn't recognise the formatting totally, as text doesn't wrap around cells automatically. The row-height has to be increased



The Tables feature in InDesign has a number of characteristics that make working simpler

Digit Test Process

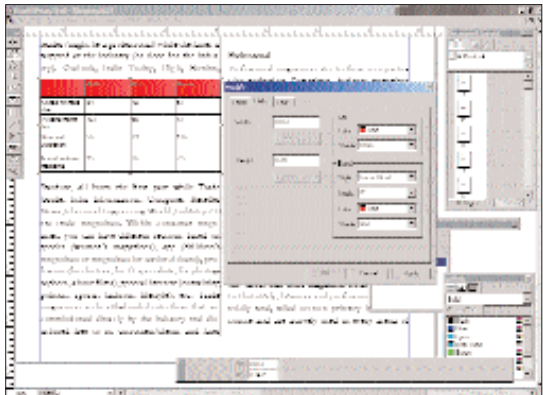
We primarily tested four new features in InDesign and Quark: Layers, transparency support, tables and saving to Web and outputting to PDF. We created a test document in Word which was then placed in InDesign and Quark. To these documents, we added certain images and applied different effects to them, specifically testing the options for tables and layers.

For InDesign, we tried importing a table from a spreadsheet as well as a Word document. We applied different styles in the document and then created

an XML document using the tags applied to the stylesheets.

We separately created a Web document in Quark with tables, forms, rollovers, and other features and tried recreating the same document in InDesign.

A feature we couldn't test was how the files outputted on to a positive. Earlier versions of Adobe InDesign had reported problems during outputting, though Adobe claims to have resolved these issues.

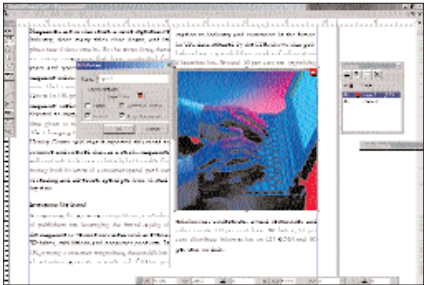


In Quark, only row or column level manipulation is possible

for this to happen. InDesign wins round No. 1 comfortably. Score: Adobe 1 Quark 0

Round 2: Layers

How would you like to create multiple versions of the same document without having to layout two different files? Say, a text-only version and another version with all images present? Quark has finally introduced Layers (something that's been present in PageMaker for ages and in InDesign since the beginning), and gone a step



With Quark you can add an image to a new layer and check whether you want to keep it visible or locked

ahead in adding better features. With Layers, you can place your text in one Layer, and the images in another, or have two versions of the opening visual for your cover with the text remaining the same.

The difference is that in Quark you can make the text runaround the Layers even if they are hidden—a feature absent in InDesign. This makes it very simple to create a text-only version (say, for proofing purposes), while retaining the images in another layer. It's more tedious to work with Layers in InDesign. You cannot click an element and add it to another Layer as in Quark. The workaround is to duplicate the Layer on which the element is and then go back to the original Layer and delete it. Round 2 goes to Quark.

Score: Adobe 0 Quark 1

| Features at a Glance | | |
|----------------------------|---|---|
| | Adobe InDesign 2.0 | QuarkXPress 5.0 |
| Tables | Create tables, import from Word and Excel directly, cell-level manipulation possible | Create tables, imports from Word as tabbed text, row- or column-level manipulation possible |
| Layers | Create as many layers as you like, colour-code them, or lock and hide them. Shifting an item from an existing layer to another layer is problematic | Create as many layers as you like, colour-code them, lock them and hide them. Options for disabling or enabling text runaround around hidden layers. Quite simple to use |
| Transparency | Can import transparent images, such as a Photoshop file, directly. Add Drop Shadow and Feather effects to image as well as text and work with different blending options | Can only import from flat files. For transparency you have to create a clipping path in the image. No text or image-handling effects present |
| Web | Can export as HTML or XML. However, HTML export isn't that good. Can Tag text as per stylesheets. Relatively easier to use | Can create a Web document with options for forms, rollovers, adding buttons, etc. A Web document outputs as you see on screen. XML tagging can be done but isn't all that easy to use |
| Text and document-handling | Adds number of features such as inserting page breaks or column breaks. Can add special characters or work with ligatures and open type fonts. Can create indexes and table of contents | Can create indexes and table of contents (using Lists option). Cannot insert page breaks or column breaks |
| Single highlight | Tables | Layers |
| Pros/Cons | + Transparency and table features - Web export disappoints | + Layers, Web document - Cannot export transparent documents directly |
| What's still missing | Storyboard editor, check spelling as you type, bulleted list options | Import tables from Excel, direct support for transparency objects, storyboard editor, spell-checker as you type, bulleted list options |
| Price | Rs 36,500 (Rs 8,500 for an upgrade) | N/A |
| Contact details | Phone: 0128-4532026, Fax: 0128-4531967 | Phone: 0172-257801, Fax: 0172-257414 |

Round 3: Transparency

Most designers who work with images are going to love the transparency features in InDesign. While InDesign natively imports Photoshop files with transparent images, it also allows you to add transparency effects such as Drop Shadow to the text and the imported images. That means you can create rich text effects on the fly without resorting to techniques such as duplicating the text box and placing it behind to give a shadow effect. InDesign has different blending options that define how the colours between two objects will show up when different drop



InDesign allows you to apply different text and image effects and creates transparent layers

shadow effects are applied. You can state the transparency for the effects at the same time.

These enriched features mean that designers can work on a number of text effects in InDesign directly without having to switch to an image-editing tool such as Photoshop every time. Even text wrapping with transparent images is enhanced as you can wrap text around the contours of an image (without actually having to draw a path around the image).

With Quark, you still have to work with clipping paths or Alpha channels in your image-editing software to get transparent images. InDesign gets back into contention with round 3.

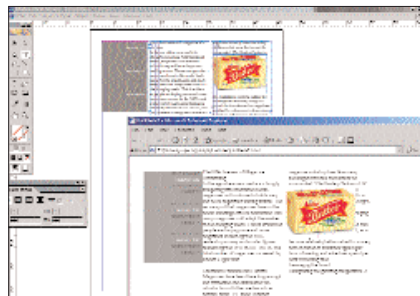
Score: Adobe 1 Quark 0

Round 4: Saving options

Content generators face a regular problem of having to export their documents from Quark, InDesign, PageMaker or any other desktop publishing software to the Web or as a PDF document. With earlier versions of Quark and InDesign, saving for the Web was a tedious process, and the results weren't satisfactory either.

Now, both InDesign and Quark have invested a lot of time in enhancing tools

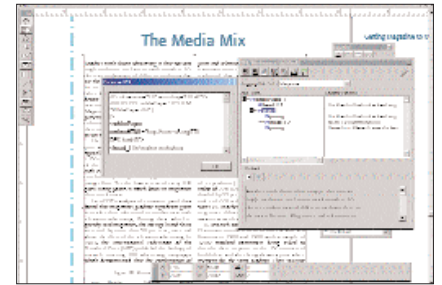
for saving to the Web. InDesign allows you to directly export documents as an HTML file while in Quark you can create a Web document that can be exported as an HTML file. Quark's HTML rendering seems to be superior when you use the Web document feature. It recognised column layouts and tables that were created, and managed text wraps around images as per HTML standards. With Quark you can even use advanced features such as creating forms and buttons, adding rollover to images, creating image maps, etc all of which were absent in InDesign. Note that during testing, we were unable to resize the Form buttons. At the same time, Quark has integrated Avenue Quark in this version. This allows you to create XML documents with the text and images tagged as per the stylesheets. The learning curve for XML, however, is a bit steep, and we can't visualise art directors spending time tagging text and images and importing them. Again, in Quark, the number of tagged styles available for XML in the default file were limited; so unless you create an XML document of your own, the number of styles that you can tag are limited. InDesign too offers XML tagging features and is more intuitive in that respect—you can directly create tags as per stylesheets or conversely make tags and add stylesheets to them.



With InDesign, column formats do not render as well as is evident from the text wrapping that's gone haywire



You can create a Web document directly in Quark and apply a number of effects. The export to HTML renders it quite well



Quark is still a bit behind in the ease of use as far as XML tagging is concerned



InDesign is quite intuitive when it comes to tagging text and generating an XML output

In PDF conversion, InDesign has an innate superiority and comes with a number of options. Quark, on the other hand, has no PDF converter of its own, and has to use Adobe Distiller to manage the conversions. InDesign also offers other export formats such as SVG (scalable vector graphics).

With the introduction of colour management systems in both software, reproduction is enhanced. You can now ensure that the colours that you see in Photoshop remain the same in InDesign or Quark. You can turn colour management on or off as per your requirement and specify the profiles to use during output. Earlier versions of InDesign had reported problems while creating output to positives and many designers feel that drop shadows and different transparencies may lead to more problems. Adobe claims it has resolved the issues and comes with a guide on how to flatten the drop shadow images before outputting. It also comes with an overprint preview that lets you know how exactly the colours have blended. InDesign wins round 4 too.

Score: Adobe 1 Quark 0

Round 5: Ease of use

Both these software retain the same look and the only difference you will notice in Quark's interface are the tools for tables and a scissor tool in the main



toolbar. A number of Web components such as tagging rules, meta tags, etc have been added to the menu items. InDesign, on the other hand, sports an entire menu for its table option. It still isn't very intuitive with its tabbed toolbars and other options hidden under another tab. Quark, in that respect, manages to place most of the frequently used tools in the Measurements toolbar, and a right-click and 'Modify' option gives you all the options related to the text or picture box. For instance, in Quark you can right-click on a picture box, select 'Modify' and set the text wrap or runaround, change the box background, the frame outline size, etc. To do the same thing in InDesign you would first have to view the Text Wrap toolbar, then use the Stroke toolbar to add the border, and then use swatches or colour to change the border colour.

However, Quark still employs a rigid framework for placing text or pictures (you have to be in a text box or a picture box with the content tool selected), while InDesign allows you to place text from anywhere. A frequently used option that figures when you right-click the text or picture box in both InDesign and Quark is the 'Fit content to box' or 'Fit box to content' options. InDesign even includes the fit content proportionately option when you right-click (it's available as a Menu item in Quark), so you do not have to bother about resizing your picture box. InDesign takes round 5 too.

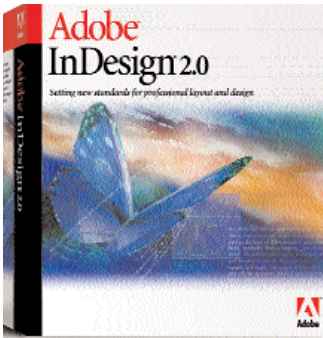
Score: Adobe 1 Quark 0

The winner

Feature for feature, whether it's tables,

Who's Buying

Worldwide, the desktop publishing market is fairly fragmented. At the lower end of the scale, Adobe PageMaker and Microsoft Publisher target desktop users and DTP operators. These software are being used for basics such as research or thesis reports, small newsletters, greeting cards, mass mailers, etc. Designers and graphics professionals working with media houses or advertising agencies use a mix of QuarkXPress and Adobe InDesign—Quark is still the leader. Book publishers either choose Adobe FrameMaker for their specialised requirements with long documents, or use PageMaker. But in India, the scenario is somewhat different. Most of the desktop publishing shops you see around the corner work with PageMaker extensively for a variety of tasks ranging from advertisements to reports. The reasons may be that PageMaker is more easily 'available' than QuarkXPress. A higher-end design setup such as a publishing house or advertising agency works mainly with QuarkXPress. InDesign is still not a favourite with anybody. The scenario might change a little with InDesign 2.0, but that depends a lot on the pricing bundle offered for an upgrade from QuarkXPress and Adobe's ability to convince pre-press units about the output quality of InDesign.



transparency options, text handling and manipulation options or outputting to different formats, Adobe InDesign 2.0 is superior. InDesign works almost like a word processor in most respects. However, Quark scores in its usage of layers and Web formatting.

The features of Tables and Layers are reason enough for most designers to upgrade from Quark 4.x to version 5, while InDesign 1.x users will love the transparency options as also the ability to create tables. Quark 5 can save as version 4 but the layers option won't be available and the cells in tables get converted into individual text boxes aligned to each other.

| Decision Maker | | |
|---|--|--------------------------|
| Current software | Nature of work | Go for |
| Adobe InDesign 1.x | Dealing with text and images extensively for newsletters, brochures, covers | Adobe InDesign 2.0 |
| Quark 4.x/3.x | Dealing with text and images in not so long documents. Working with image-editing software too | Quark 5.0 |
| Adobe PageMaker 6.x/7.0 | Dealing mainly with text; working on long documents | Retain the same software |
| | Dealing with text and images and not so long documents | Adobe InDesign 2.0 |
| New purchase of desktop publishing software | Not so long documents, with images | Adobe InDesign 2.0 |
| | Long documents mainly dealing with text, such as a book | Quark 5.0 |

Designers working extensively with images, especially brochures, newsletters or covers will find that InDesign 2.0 integrates a number of functions and provides for a number of text effects that otherwise would have had to be done in Photoshop. InDesign even provides a filter to directly open Quark 4.x and earlier version files in InDesign, and the conversion is quite smooth, though you will still have to do some touch-up. InDesign doesn't come with any option to save in a previous version.

If you use a software like PageMaker and deal with images a lot, you can shift to InDesign. This software has the capability to open PageMaker versions too. However, if your main work still relates to text composition, then PageMaker is still better at that.

As a new purchase for text and image handling, Adobe InDesign 2.0 is a better option than Quark, though it would be first advisable to check with your pre-press unit for problems relating to outputting from InDesign.

Overall, Quark still retains the simplicity of its earlier versions even though it lacks various other features. In fact, you can easily get lost among the various features of InDesign. However, designers working on Adobe Photoshop and Illustrator may find the interface of InDesign quite familiar and take a liking to it.

MOHAN KRISHNAN

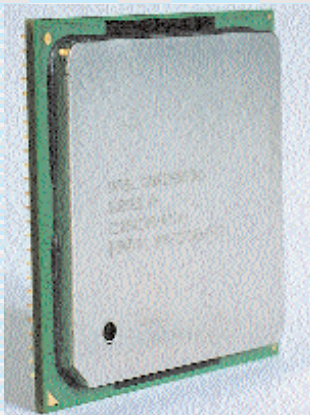
Bazaar

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

Intel Pentium 4 2.4 GHz

New speedster on the block

The latest revision of the Pentium 4, running at a truly impressive 2.4 GHz, has been launched. It uses the Northwood core with 55 million transistors and 512 KB of L2 cache. The processor scored some impressive benchmark results. We used Intel's D850MD board with 512 MB RDRAM, ATA 100 hard drive and a GeForce3 graphics card to test the processor. It produced the highest score ever recorded in *Quake III*—375.8 fps in normal mode. Its trailblazing



performance extended to Content Creation Winstone

2001—the processor helped the system touch the magic figure of 90.3 as against 86.1 that the 2.2 GHz processor had achieved on the same configuration. The other scores were equally impressive. The processor remained cool during the test and the rather large heatsink that Intel ships with this processor more than takes care of its temperature. Individuals working on high-end 3D

authoring software or those who employ tools for intensive non-linear video editing will be able to fully appreciate its true power. Gamers too will find this processor a worthy companion for their high-end graphics cards.

SPECIFICATIONS

0.13 micron die size, Socket 478, 512 KB L2 cache

| | |
|-------------------------|----------|
| Intel Pentium 4 2.4 GHz | A- |
| Performance | ★★★★ |
| Build Quality | ★★★★ |
| Value for Money | ★★★ |
| Features | ★★★★ 1/2 |
| OVERALL | ★★★★ |

Price: Rs 35,000
Contact: Nebula Technologies
Phone: 022-6347159
E-mail: pankaj@nebulatech.com
Web site: www.intel.com

Acer Digital Camera 300

A good shot

This camera is ultra-slim and weighs a mere 78 grams. It measures 18.4 mm in thickness, so it can snugly fit into your pocket. It can store 90 to 95 images taken at a resolution of 640x480. There are six utilities bundled with the digi-cam—Mr. Photo, Image Folio, Video Works, It's Me (3D figure animation tool), Crazy Talk (face animation tool) and Microsoft NetMeeting. And of course, there are the drivers.

The camera took good quality images in a well-lit room and even objects placed at a distance were clear. The flash was kept on auto mode while taking the photographs.

The camera takes about 4 seconds to save the image in the memory, and until that is done, the busy light keeps blinking.



This camera can be used as a PC Web camera and a digital video camera (with a frame rate as high as 30 fps).

The transfer of images from camera to PC through the USB interface was fast. The camera even has a cradle with a lock which helps in fixing it on a laptop. However, it can't be placed on top of the PC or monitor with the cradle attached. The installation of the drivers was an easy task and the manual is fairly descriptive. The cam-



Marshall Mascarenhas
Art Director, JDM

It's a sleek, slim and flauntable product—a good camera for personal use. The only drawback is its price. At Rs 9,000 it's way too expensive

era can even be used outdoors as it is lightweight, has a compact design and comes in a nifty carry bag.

Price: Rs 9,000
Contact: Neoteric Informatique
Phone: 022-4172600
E-mail: saxena@neoteric-info.com
Web site: www.acercm.com

Advance Font Catalog 1.20

Manages fonts effortlessly

This small utility works as your font manager, which lets you catalogue different drives with font files. The Explorer-like interface makes the task easy and the learning curve short. After scanning the drives, the utility shows all the fonts that are installed or saved on a particular drive or media.

This utility allows you to add comments to the different fonts by right-clicking on the font. These comments can be later used to find the fonts on the system. You can search for different fonts on the basis of name, style or category. You can make categories to distinguish between different fonts, which helps reduce the time spent searching for them.

Advance Font Catalog even has multilingual support

Price: \$29.95 for one license (approximately Rs 1,470)
Web site: www.wizetech.com

Neotech NKC-9999A

Wireless freedom

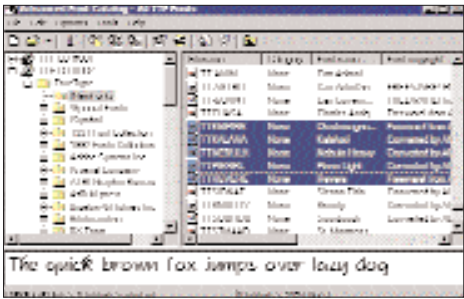
This wireless keyboard from Neotech comes with a built-in mouse and a base unit, which receives the infrared signals. The keyboard has a layout similar to that of a laptop and it takes some

SPECIFICATIONS

640x480 pixel resolution, 8 MB built-in memory, built-in flash, USB interface, 0.6 M to infinity focus range

| Acer Digital Camera B+ | |
|------------------------|-------|
| Performance | ★★★★★ |
| Build Quality | ★★★★★ |
| Value for Money | ★★★★½ |
| Features | ★★★★½ |
| OVERALL | ★★★★½ |

for eight different languages. The 15 days evaluation copy can be downloaded from the site, which has all features enabled.



The installation was fast and easy and occupied just 925 KB of hard disk space. It is suitable for layout and design professionals, especially those who use several types of standard and custom-made fonts.

SPECIFICATIONS

925 KB install size, works on Windows 95/98/NT/2000

| Advance Font Catalog 1.20 B+ | |
|------------------------------|-------|
| Performance | ★★★★★ |
| Ease of use | ★★★★★ |
| Value for Money | ★★★★★ |
| Features | ★★★★★ |
| OVERALL | ★★★★½ |

The keyboard needs four 1.5 V AA pencil batteries and the base unit LED blinks every time a key is pressed or when the mouse is used. A disadvantage of infrared is that it requires a clear line of sight and also has a distance limitation. This unit failed when we attempted to use it from a distance of more than 8 feet.

The placement of the buttons makes it ungainly for gaming, especially first person shooter games. Besides, the response of the keyboard is not spontaneous and it takes some time for the action to be actually seen on the screen. This makes it very difficult to scroll in Windows Explorer.

The keyboard is available in dark gray and is lightweight. The base unit has two

Price: Rs 335
Contact: Sunder Marketing
Phone: 022-4926015
E-mail: neotech@vsnl.com
Web site: www.sundermarketing.com



PS2 connectors, one each for the mouse and the keyboard. This keyboard is best for those who have a wide format LCD display or a CRT screen larger than 19 inches. An additional button on the mouse makes it easy to perform tasks such as surfing the Net, controlling the volume and so on.

SPECIFICATIONS

Infrared keyboard and mouse, base unit connects to PC through PS2 interface

| Neotech NKC-9999A B+ | |
|----------------------|-------|
| Performance | ★★★★★ |
| Build Quality | ★★★★½ |
| Value for Money | ★★★★★ |
| Features | ★★★★★ |
| OVERALL | ★★★★½ |

Priya 32x CD-Writer

Slow and unsteady

This 32x CD-Writer from Priya comes bundled with NTI CD-Maker v5.3. The tests were run using this software, as the drive was not detected by Nero v5.5.2.4. Strangely enough, NTI CD-Maker does not allow you to deselect the 'Verify' option. Hence, the CD writing times were heavily skewed. The drive took just 7 minutes 40 seconds to burn a 650 MB CD of assorted data but the total time taken (to

burn as well as finalise) was 16 minutes 46 seconds. The same data when burned on a CD-RW took 17 minutes 46 seconds. What was rather unusual was that it took just a minute more to burn the data at 10x on a CD-RW. When burning on CD-R, even though we selected a speed of 32x, the writer burned at approximately 10x speed.

The drive has integrated burn-proof technology. It, however, crashed continuously in the Nero CD Speed test—we ran this test four times with different CDs, which included audio CDs as well as CDs with assorted data.

The drive features play and volume knobs and the headphone socket on the front



panel and comes bundled with one Ritek 10x CD-RW and an IDE cable. It is available for Rs 6,500, which makes it an option for those looking

Price: Rs 6,500
Contact: Priya Ltd
Phone: 022-2663611
E-mail: jain@priyagroup.com
Web site: www.priyagroup.com

Idex v3.1

Cataloguing for beginners

Idex v3.1 is a basic database tool. The database can be named according to the files it contains and the utility searches it instantaneously by assigning keywords. Idex



is a convenient tool for organising and indexing image, multimedia, text and other files and accessing them fast. The utility scans the entire hard drive or the path (whichever is specified) and presents the user with the files almost instantly.

The software even has a built-in viewer to view the images in the database.

Price: \$30 (approximately Rs 1,470)
Web site: www.idexworld.com

Amkette Internet mouse

As inexpensive as it gets

Name a computer component that you can buy for under Rs 400. The Amkette Internet scroll mouse retails for as low as

for a relatively inexpensive CD-writing solution.

SPECIFICATIONS

32x/10x/40x speed, IDE interface

| Priya 32x CD-Writer | | B |
|---------------------|-----------|---|
| Performance | ★ ★ ★ 1/2 | |
| Build Quality | ★ ★ ★ 1/2 | |
| Value for Money | ★ ★ ★ | |
| Features | ★ ★ ★ | |
| OVERALL | ★ ★ ★ | |

Alternately, you can use the thumbnail option. You can also define the size of the thumbnails. Idex even lets you create a slide show of the images, define the time gap between the slides, add text to the slides and arrange the images in a specific order to make a simple presentation of the slide show.

The tool is best suited for those who maintain a large number of files and graphics professionals who would usually have hundreds of image files that they work upon and use regularly.

SPECIFICATIONS

26 MB install size, works on Windows 95/98/NT/2000

| Idex v3.1 | | B+ |
|-----------------|-----------|----|
| Performance | ★ ★ ★ 1/2 | |
| Ease of use | ★ ★ ★ | |
| Value for Money | ★ ★ ★ 1/2 | |
| Features | ★ ★ ★ | |
| OVERALL | ★ ★ ★ | |

Rs 335. The mouse comes with a specific driver without which the system won't recognise it (you will find an exclamation mark in Device



Manager). It supports 700 dpi resolution and the middle button can be programmed

Price: Rs 335
Contact: Allied Electronics
Phone: 011-6839876
E-mail: info@amkette.com
Web site: www.amkette.com

Duron 1.3 GHz

Duron Duron

The Duron 1.3 GHz is the latest from the AMD bandwagon and is built using the Morgan core. The processor performed admirably in all the tests. In 3DMark2001, the processor on an A7V266-E motherboard with 256 MB DDR SDRAM and a GeForce3 graphics card achieved a score of 5288. It logged 174.2 fps in *Quake III Arena* in normal mode and 170.6 fps in high quality mode. The reason the scores are limited in spite of such high-end hardware is the processor itself. The scores, however, were pretty decent in Content Creation Winstone 2001—67.4. It scored 49.2 in Business Winstone 2001, which makes it a great processor for office applications. Any processor with a Business Winstone score of over 40 can handle most modern office applications without a hitch.

The only point of concern with this processor was that it got noticeably hot while we ran the tests on it. This means

Price: Rs 7,500
Contact: BBS Electronics
Phone: 022-8252533
E-mail: Mukesh.ahuja@bbsgroup.com.sg
Web site: www.amd.com

to for different functions in different applications. This mouse is best suited for point-and-click actions and is not recommended for gamers or people who tend to use their mouse for extended periods of time.

SPECIFICATIONS

Scroll mouse with two buttons, serial interface

| Amkette Internet Mouse | | B+ |
|------------------------|-----------|----|
| Performance | ★ ★ ★ | |
| Build Quality | ★ ★ ★ 1/2 | |
| Value for Money | ★ ★ ★ | |
| Features | ★ ★ ★ | |
| OVERALL | ★ ★ ★ 1/2 | |

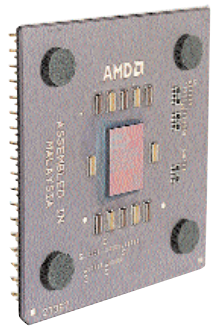
the user will have to invest in a decent heatsink.

There are now several motherboards available in the market for the Duron. A VIA KT133A chipset board when clubbed with SDRAM will give you decent performance at an affordable price, whereas a DDR SDRAM chipset like the KT266 offers high performance which will suffice the needs of home and office users. The Duron 1.3 GHz is a good bet for those who don't want to loose out too much on performance, but are reluctant to let go of the purse strings.

SPECIFICATIONS

Morgan core, 128 KB L1 cache and 64 KB L2 Cache, 0.18-micron fabrication process, 1.75V power consumption

| Duron 1.3 GHz | | A- |
|-----------------|-------|----|
| Performance | ★ ★ ★ | |
| Build Quality | ★ ★ ★ | |
| Value for Money | ★ ★ ★ | |
| Features | ★ ★ ★ | |
| OVERALL | ★ ★ ★ | |



HP 948c Inkjet Printer

Warm up to this one

The HP 948c comes with a built-in 2 MB buffer, which facilitates easy and fast printing of large files, especially images and large PDF documents. It has a space-saving



foldable paper tray and comes with both USB 1.1 and a parallel interface. The printer can churn out a maximum of 12 A4 sheets of text in a minute. However, the printer has a relatively high initial warm up time (18.31 seconds). To print the test image on plain paper (colour printout), the printer took 3 minutes 26 seconds—fairly acceptable. The printer took about 3 minutes 20 seconds to print the same image in grayscale, which is just 6 seconds faster than the

Price: Rs 9,999
Contact: Hewlett-Packard India Ltd
Phone: 080-5216121
E-mail: princy_bhatnagar@hp.com
Web site: www.hp.com

colour printout test. It took a little over a minute and 30 seconds to print the test PDF document (36 MB), which is pretty fast. Once the initial warm up is done with, the printer doesn't waste any more time warming up for subsequent printouts.

It is capable of printing at a resolution of 2400x1200 dpi and supports HP's ColorSmart3, which optimises photographs, text and other graphics by adjusting the colour settings. The printer has some nifty buttons on the front panel—a resume button, a button to cancel the print and a power button. This printer is targeted mainly at home and small office users who are looking for a high quality inkjet printer and don't have demanding and continuous printing jobs.

SPECIFICATIONS
2 MB buffer, USB and parallel interface, 100-sheet tray

| HP 948c Inkjet Printer B+ | |
|--|----------|
| Performance | ★★★★ |
| Build Quality | ★★★★ 1/2 |
| Value for Money | ★★★★ 1/2 |
| Features | ★★★★ 1/2 |
| OVERALL | ★★★★ 1/2 |



Sriram Sharma
Writer, Digit

Saitek R100 is a good and inexpensive steering wheel with decent build quality, but there's no force feedback!

Saitek R100

Not one for the aficionado

This steering wheel from Saitek fits neatly onto the desk and the clamping mechanism is strong enough to sustain severe jerks. But disappointingly enough, the friction pads provided for the pedals are not effective enough to hold them in one place. The pedals can easily move out of range and even the pedal placement is too close for comfortable use. The buttons are easy to configure and their placement is fairly comfortable.

The price tag of the wheel is an affordable Rs 2,250, which makes it attractive for most users who are looking for an inexpensive and fairly decent steering wheel. The build quality is quite acceptable and the pedals are strong



enough to sustain regular punishment, albeit being a bit noisy. The wheel comes with a manual, which carries detailed information about calibration

and a few FAQs for troubleshooting. The R100 requires no drivers and is detected without any trouble.

The Saitek R100 is ideal for the occasional gamer, someone who is not interested in spending a lot for a force feedback steering wheel as this is a very basic solution. The hardcore racing game fans will have to look elsewhere.

SPECIFICATIONS
Two axis, four buttons, doesn't require any drivers

| Saitek R100 B+ | |
|-----------------------------|----------|
| Performance | ★★★★ |
| Build Quality | ★★★★ |
| Value for Money | ★★★★ |
| Features | ★★★★ 1/2 |
| OVERALL | ★★★★ 1/2 |

Price: Rs 2,250
Contact: Origin Marketing
Phone: 022-8835886
E-mail: origin121@vsnl.com
Web site: www.saitek.com

Millennium Accountant

For accounting newbies

This accounting package designed in MS Access is easy and simple to use. The software comes with an intuitive interface and even has a security system allowing only authenticated users to use the application. It has templates of master accounts for Chartered Accountants, manufacturing units, traders and home managers. Users can create their own templates too. It gives users an option for inventory management as well as sales and purchase order management and can even generate a payroll report. What the package lacks is an effective reporting suite—it provides only the



basic profit and loss, balance sheet and MIS reports. This application also has a built-in utility for Web browsing as well as for data backup and restore (on any desired location). It gives users the option of repairing data through a

built-in utility in case of corruption from a virus attack or disk error. The installation has a small footprint of about 9 MB under basic settings. This software is ideally meant for users who are not very familiar with accounting terminologies

Price: Rs 4,750
Contact: Bala Infotech System
Phone: 04565-430201
E-mail:
info@bala-infotechsystems.com
Web site:
www.bala-infotechsystems.com

and who also do not require extensive features integrated into a single application.

SPECIFICATIONS

Minimum System Requirements:
Windows 95, 32 MB RAM, CD-ROM drive

| Millennium Accountant B- | |
|--------------------------|---------|
| Performance | ★ ★ ★ |
| Ease of use | ★ ★ ★ |
| Value for Money | ★ ★ 1/2 |
| Features | ★ ★ |
| OVERALL | ★ ★ 1/2 |

Samsung Crystal Optical Mouse

The future is in your palm

This mouse has rather futuristic looks. It has a transparent body, which itself acts as a unified right and left-click button—tilt the body towards the left and it left-clicks, tilt it to the right and it right-clicks. The scroll button glows with a blue light.

The mouse is bundled with the Crystal Optical Mouse software utility, which lets the user configure the mouse and scroll button as per requirements. Since it's an optical mouse, it can be used on any surface—on your leg, over wood or any kind of fabric. The mouse sends as many as 1,500 signals per second to the digital signal processor, which makes for precise movements onscreen.

The mouse is definitely not suited for gaming, especially in first person shooter games because of the absence of two unique left and right-



click buttons. As the entire body acts as a unified button, the gamer will be unable to use two buttons simultaneously, which is unacceptable. There is no finger rest (the depression usually provided on the button) that could have made clicking easier. Due to this, you end up moving your entire palm while clicking. The mouse is available with a PS2 interface and is detected automatically.

SPECIFICATIONS

Scroll mouse with two buttons, PS2 interface

| Crystal Optical Mouse B+ | |
|--------------------------|-----------|
| Performance | ★ ★ ★ 1/2 |
| Build Quality | ★ ★ ★ 1/2 |
| Value for Money | ★ ★ ★ |
| Features | ★ ★ ★ 1/2 |
| OVERALL | ★ ★ ★ 1/2 |

Price: Rs 1,475
Contact: Spur Enterprises
Phone: 022-4080608
E-mail: spur@vsnl.com
Web site: www.samsung.com

Olivetti Artjet 22

Not much of a performer

The Olivetti Artjet can be placed both horizontally and vertically. It can print envelopes too, but they have to

be placed in the output tray. It comes bundled with the Micrografx Windows Draw 6 graphics suite and Micrografx Picture



Publisher. It has a power supply and comes with a parallel printer cord (no USB cable). Also bundled are five sheets of coated paper and a single black and white and colour cartridge. When tested for document printing (text) in black and white mode, it printed four pages in a minute. It took 5 seconds to warm up before picking up the paper. The Artjet 22 took 53.28 seconds to print a test PDF document under default settings but in the high-

Price: Rs 9,005
Contact: Spice Net
Phone: 022-6132165
E-mail: ro_mum@spicenetindia.com
Web site: www.olivettilexicon.com

G-Lock EasyMail

The mailman's here

This 2.5 MB mail client has options for merging fields in the mail, similar to MS Word's Mail Merge. It is easy to install and setup and could very well replace any of the bundled or existing e-mail clients that you might be using. The tabs provided at the bottom let you view either the source, html preview or text preview of any mail that is being worked on currently. However, this application does not have any 'cc' field. It has two different views, namely, Message Control and Send Manager for Incoming and Outgoing mail—this can create some confusion initially among new users. The database import and export feature is a point in its favour—it can

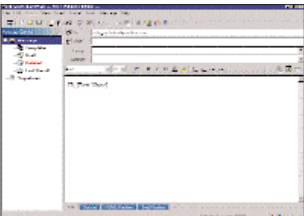
Price: \$39.95 (approximately Rs 1,960)
Web site: www.glocksoft.com

quality mode, it took a whopping 6 minutes and 35 seconds! The PDF document showed minor smudging and the white coloured fonts (point size 10 and below) on a black background were unreadable. The printer was unable to print that part accurately in both default and high quality settings. In the colour reproduction test, the test picture looked washed out. The printer is best for users who go with the default settings for most of their printing and only need to print high-quality colour documents occasionally.

SPECIFICATIONS

USB 2.0 and parallel interface, 1200x1200 dpi output in black and white and colour, Windows 3.11/95/98/2000, 13 pages per minute in black and white mode

| Olivetti Artjet 22 B+ | |
|-----------------------|-----------|
| Performance | ★ ★ ★ ★ |
| Build Quality | ★ ★ ★ 1/2 |
| Value for Money | ★ ★ 1/2 |
| Features | ★ ★ ★ 1/2 |
| OVERALL | ★ ★ ★ 1/2 |



import data from any of the available popular databases including Paradox, dBASE and Excel. It also has ODBC SQL support. This application is best suited for novice users.

SPECIFICATIONS

2.5 MB file size, compatible with Paradox, dBASE and Excel, supports ODBC SQL

| G-Lock EasyMail B | |
|-------------------|-----------|
| Performance | ★ ★ 1/2 |
| Ease of use | ★ ★ ★ 1/2 |
| Value for Money | ★ ★ 1/2 |
| Features | ★ ★ ★ |
| OVERALL | ★ ★ ★ |

CPU searching

Willamette or Northwood, Athlon or Duron, the quest is neverending...

Over the past few months processors have gone through significant speed gains and attractive price cuts. There's a lot of buzz with the launch of new CPUs such as the Intel P4 2.4 GHz and the AMD Athlon XP 2100+ chips, while veterans such as the Socket 423-based P4 1.4/1.5 GHz (Willamette), the Athlon 1.4 GHz (Thunderbird) and the older Durons are slowly fading away.

My mission is crystal clear—To buy a good processor in less than Rs 8,000.

At my first stop, I state my budget and ask for a recommendation. The dealer suggests that a P4 1.6 GHz (Socket 478) is now available for as low as Rs 8,500. Just a little out of my budget, but an enticing option nonetheless. Just to be doubly sure, I ask the dealer to confirm whether it's a Northwood processor with 512 KB of L2 cache. The packaging mentions that the CPU has only 256 KB of L2 cache—it's the outdated Willamette core! You need to be careful as there are plenty of older Willamette core-based P4 processors in the market. While these CPUs support the latest Socket 478-pin format, they contain only 256 KB of L2 cache. The performance of these processors is about 10 per cent less than their Northwood counterparts. The older Willamette (Socket 423) processors with speeds up to 1.5 GHz can also be bought for a bargain price. If you're not thinking of upgrading in the next two years or so, then a cheap Socket 423 solution makes sense. Socket 423 motherboards have since long been out of fashion and many dealers will be ready to sell them at a discount. This makes them an attractive upgrade option.

I move on to the next dealer, this time shifting gears and inquiring about a P-III

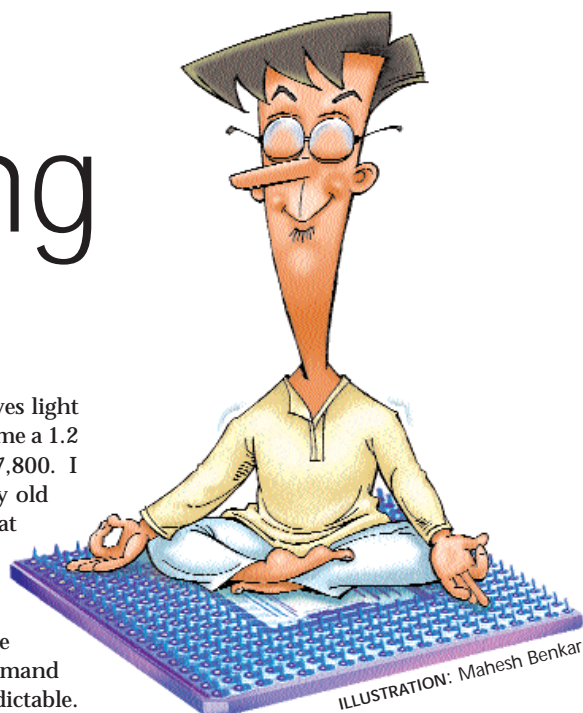
Tualatin processor. The dealer's eyes light up and he states that he can offer me a 1.2 GHz processor for around Rs 7,800. I inquire whether it can run on my old 815E motherboard, but am told that I would need to upgrade my board. Ironically these slower (and old generation) processors are more expensive than some of the P4 CPUs as there's little demand for them and availability is unpredictable. According to the dealer the P4 1.7 GHz (Socket 478), which costs Rs 7,350, is the most sensible choice, but if you're looking for something cheaper then a 1.1 GHz Celeron for Rs 5,800 is a good option.

The next shop is a genuine Intel dealer. He doesn't have the P4 1.6 GHz (Northwood) CPU in stock as it's not readily available—the processor can be bought for as little as Rs 8,500 depending on availability. The 1.9 GHz CPU is more easily available and at Rs 10,000 is the current hot seller. I ask for something below Rs 8,000 and he offers a Celeron 1 GHz (Tualatin) for just Rs 4,500. This processor works at a FSB of 100 MHz and requires an 815EP class motherboard to support it.


I move on to a new shop and ask for an older generation processor. The dealer has a couple of Duron 800s, which he's ready to sell for Rs 2,800. He even has an old P-III 1 GHz processor for Rs 8,500. It's way too expensive for an old generation P-III, but some people still prefer buying these CPUs for a dual processor workstation.

My final stop is Chunam Lane in Lamington Road, where I ask for a Duron processor. The dealer suggests that since I'm ready to spend Rs 8,000, I should opt for an Athlon XP instead. With the release of the Athlon XP 2100+, the prices of the lower-clocked CPUs have dropped substantially and an Athlon XP 1700+ is available for about Rs 7,500. I insist on a Duron, and he suggests the Duron 1.2 GHz processor, which retails at about Rs 6,000.

When upgrading from an Athlon Thunderbird core, ensure that your motherboard supports the new Palomino core—the same applies to the new Durons as



well. Also, AMD processors are now shipped in a retail box with an AMD recommended heatsink. Do not get conned into paying extra for the heatsink.

The Athlon XP hits the sweet spot, but you need DDR RAM to get maximum performance. But even a low-end CPU (like the 1600+) clubbed with SDRAM memory will pack a decent punch. The P4 1.6 GHz (Northwood) is another wonderful bargain, and when paired with DDR SDRAM, forms a potent combination. 

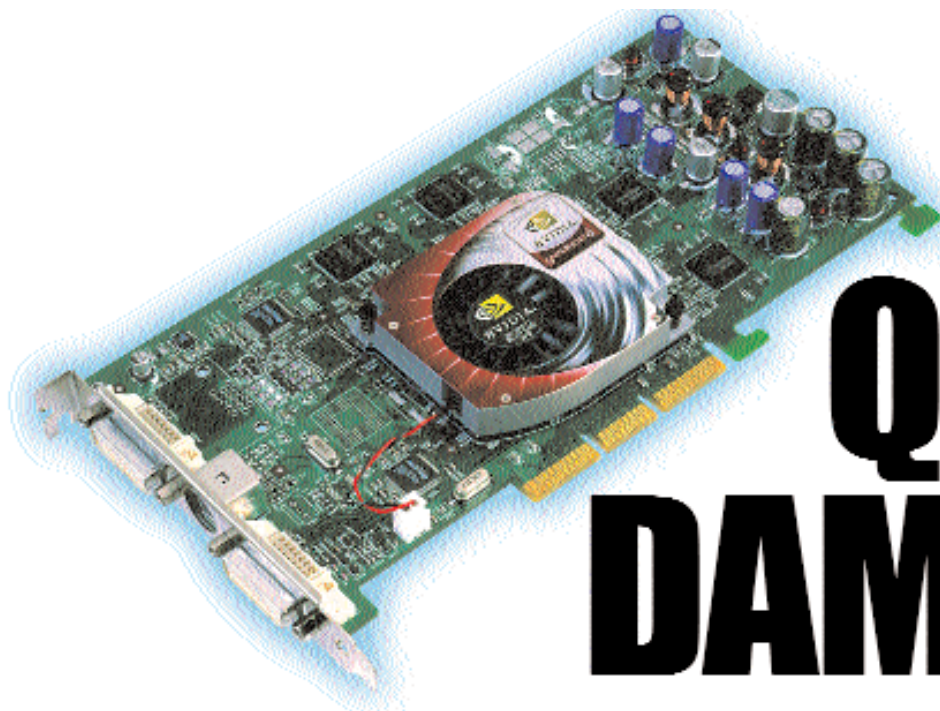
Before you Upgrade...

- Ensure that your motherboard supports voltage and FSB requirements of the new CPU.
- If you're using a slot interface board then you might have trouble upgrading since socket adapters for recent processors such as the Athlon XP and the P-III (Tualatin) are not available.
- Older socket 423 motherboards can only support the slower P4s (1.4 to 1.8 GHz). You cannot run the latest P4s (2.0 GHz and above)
- If you have an old motherboard and are using a 200 MHz FSB-based Athlon CPU, then you will not be able to upgrade to the newer Athlon CPUs that use a 266 MHz FSB.
- If you are planning to upgrade to a P4 or an Athlon XP, then use RDRAM memory for the P4 or DDR SDRAM for the Athlon XP. Most new applications and games need a lot of RAM and 256 MB should be considered as the absolute minimum.



Shopping for Writers

With the release of 32x and 40x models, the prices of 24x CD-RW drives have crashed below the Rs 5,000 mark. You can get a Samsung 24x writer for approximately Rs 4,500, while the ASUS 24x unit costs Rs 5,000!



QUAD DAMAGE

With the introduction of its fourth generation of GeForce graphics cards, nVidia is all set to blow away the competition. Again

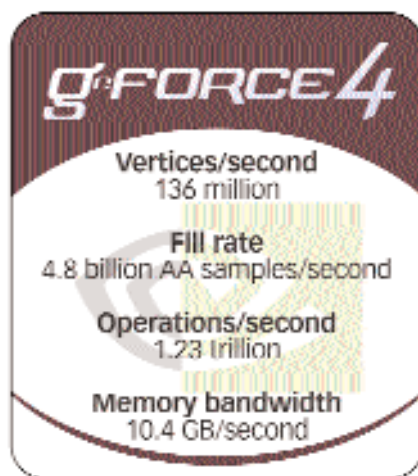
Everybody enjoys playing games on the PC. Well, almost everybody. And games on the PC have come a long way from the days when *Space Invaders* and *Pacman* ruled the roost. Today games such as *Max Payne* and *Ballistics* can entrance gamers largely due to improvements in graphics hardware over the past few years. But hold your breath. What's coming next is worlds apart.

The GeForce series of graphics cards from nVidia has taken several steps towards the holy grail of game developers—Total Reality. It gives them the ability to breathe life into their work, making it so real that suspension of disbelief in their handcrafted virtual worlds will be an easy matter. With the GeForce4, they promise to let you see the reflection of clouds in the ripples of a pond, and leaves actually fluttering under the gentle caress of an unseen breeze. This will be a world where you would see every minute detail, down to the twinkle in Duke's eye. God bless their souls.

Poetry on a PCB

One of the remarkable aspects about the GeForce series of cards is the fact that it utilises the state-of-the-art in manufacturing processes. The GeForce4 (code-named NV25) is made using 63 million transistors and uses a 0.15-micron

manufacturing process. Even Intel's Pentium 4, which has a relatively unimpressive 55 million transistors, was until recently fabricated using older 0.18-micron technology. The way the card's PCB is designed requires the use of a com-



plex eight-layer manufacturing process, which disqualifies the smaller video card manufacturing outfits from offering the top of the line GeForce4s.

In addition to this, nVidia has introduced a couple of innovations in the GeForce4, which are quite elegant from a technological standpoint. The most notable of these is the new packaging design used for the 350 MHz DDR SDRAM

present on the circuit board. This type of packaging is called μ BGA or Micro Ball Grid Array packaging because it uses tiny solder balls instead of the more traditional solder leads. Due to the greater precision possible with the solder balls the memory can be run at greater speeds with fewer transfer errors. Another benefit of this design is the fact that since the memory is smaller and denser it can be laid out in a more space efficient manner and thus runs cooler.

Inheriting the beauty of the GeForce3

Nothing attracts gamers more than 'appearances'. And this is precisely what game developers are promising to deliver to anyone who has DirectX 8.0 support in their graphics cards. The GeForce3 was the first card to support this Microsoft API and incorporated features such as programmable vertex and pixel shaders, 3D textures and so on. The single-minded objective behind all these technologies was to give developers the freedom to program custom special effects which in turn would let them create true-to-life games. The GeForce4 takes everything a step further. It takes all the potential that the GeForce3 already had in good measure and adds a few of its own new tricks that make it a 3D card to die for.

At the heart of the GeForce4 is the

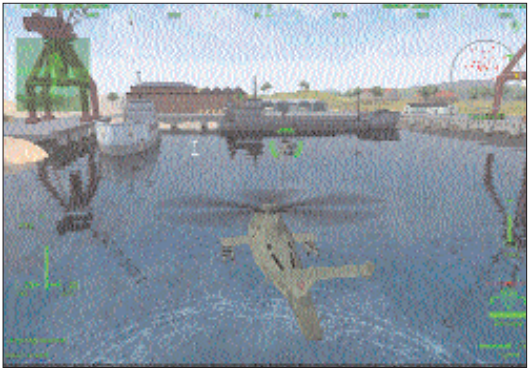
Jargon Buster

- 3D textures:** An integral part of the nFiniteFX Engine, it makes hollow objects solid with true 3D material properties such as wood grain or marbling.
- Accuview:** An advanced multisampling solution, which provides wider data paths to handle extra virtual pixels without slowing down rendering speeds.
- Advanced Pixel Shaders:** A part of the nFiniteFX II Engine that produces realistic lighting and surface effects.
- Anti-aliasing:** Reduces 'jaggles' at the edges of textures in a 3D game. Modern cards support up to 4x AA.
- Bump mapping:** A shading technique that uses multiple textures and lighting effects to simulate wrinkled or bumped surfaces so that effects such as ripples in a pond appear true to life.
- Frame buffer:** The part of video memory which stores pixel information of one complete screen data.
- Memory pre-charge:** A technique by means of which a GPU determines what part of its memory needs to be accessed next and have that section ready to accept a write or read function.
- NSR:** Short for nVidia Shading Rasterizer, it imparts realistic material properties like wrinkles on a model's face, fur etc through per-pixel shading.
- Occlusion culling:** A technique to improve performance by not rendering the objects in a 3D scene that are hidden from the human eye.
- Programmable shader:** These can be configured with software commands and can be used to create an infinite variety of special effects.
- Quincunx:** A new anti-aliasing (AA) technique that bridges the gap between the great quality of 4x AA and the performance of 2x AA.
- RAMDAC:** Short for Random Access Memory Digital to Analog Converter, it converts the digital data stored in the frame buffer into analog data that can be sent directly to an analog monitor.
- Vertex shaders:** This is one half of nVidia's nFiniteFX Engine that breathes life into characters in a 3D environment by exhibiting realistic effects such as wrinkles on a human face.
- Z-Buffer:** The area of the graphics memory, which stores the Z or depth information about rendered objects and foreground objects in the frame buffer.

nFiniteFX II Engine, which is a refinement of the one we saw in its predecessor. It has dual vertex shaders (one more than the GeForce3) and advanced pixel shaders that use a new technique called Z-correct bump to generate incredibly detailed surfaces. The GeForce4 core also features four independent pixel pipelines, each of which is capable of processing two textures per pixel per cycle.

A significant improvement over the GeForce3 is the ability to run any game with anti-aliasing 'ON', without a significant performance hit. The ultimate goal is to make anti-aliasing—which eliminates jagged edges in curved surfaces—an integral part of the gaming experience. This is now achieved by Accuview, which is the GeForce's anti-aliasing system. It combines a new sampling technique that improves quality significantly with a filtering technique that reduces the performance hit to a great extent.

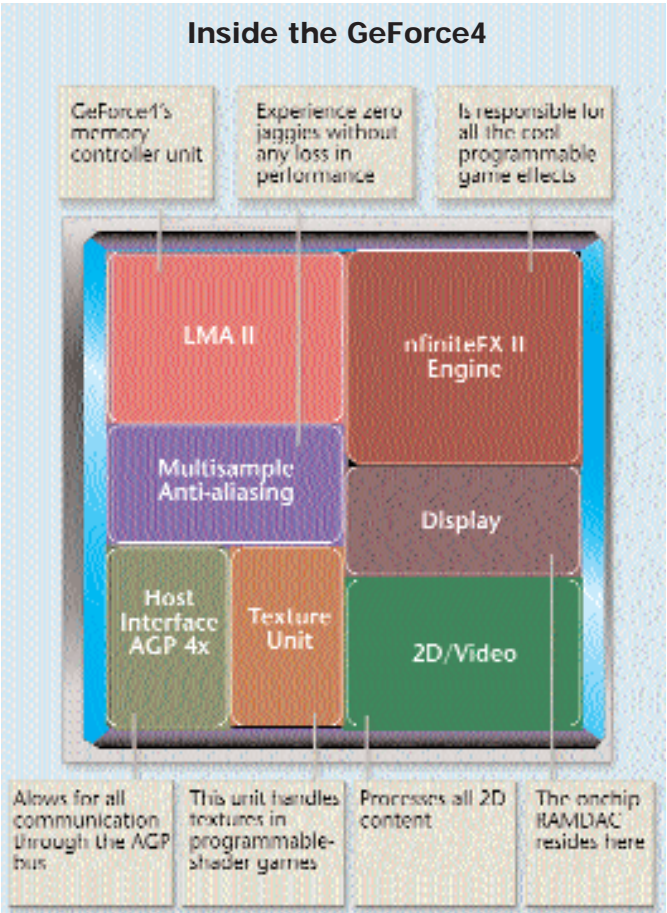
The wonder of it all
The biggest improvement over the



Check out the propeller wash thrown by the 'copter in Comanche 4. With a GeForce4 it's as real as in the movies!

GeForce3, however, is in the way the GeForce4 uses its onboard memory. If a video card isn't being fed with data at all times even the fastest graphics processor can do little to improve performance. LMA (Light Memory Architecture), which has been present from the GeForce3 days along with its crossbar memory controller, managed to save up on a lot of wasted bandwidth. LMA II takes that ideology a step further by using a combination of really clever tricks to eliminate memory bandwidth bottlenecks. There is a crossbar-based memory controller that uses a form of load balancing to ensure that all memory requests by the graphics processor are handled properly. Under complex loads, LMA II's memory crossbar architecture delivers between two and four times the memory bandwidth of other standard architectures.

Then there's the Quad Cache memory caching subsystem, which consists of high-speed access buffers that store small amounts of data and operate at tremendously high bandwidth. They make it possible for data to be queued in the right order so



that it is ready to be written to the memory without any time loss.

Lossless Z-buffer compression allows the reduction of bandwidth sapping Z-buffer traffic by a ratio of 4:1 without any reduction in image quality or precision. There is also a sophisticated visibility subsystem, which eliminates any pixels that are not likely to be visible in a scene. This helps save valuable frame buffer bandwidth, which in turn results in a performance boost.

Last but not the least comes auto pre-charge, which prepares the memory device by informing it as to which areas of the memory are likely to be used in the immediate future. This means the graphics processing unit doesn't waste any cycles while waiting for the memory—time that is better spent rendering more pixels.

All of these techniques combine to provide a big jump in performance and make visually rich real-time 3D graphics possible, without compromising on performance. The wonder of the GeForce4 is that a tried and tested design is taken to its next level of execution. Faster core cycles and features to match make the GeForce4 almost perfect.

Six flavours in two families

But enough about the intricacies of the NV25 core. What everyone wants to know about is what the cards that will use the chips are going to look like. The desktop GeForce4 line-up is made of six cards that use two different chips. The more powerful of these is the 'Ti' (Titanium) series based on the NV25 core, while the slower versions that use the NV17 core are called the 'MX' series. Within the 'Ti' and 'MX' series too you will find several variants. First up are the thoroughbreds, which will set the pace for performance until nVidia comes

out with the NV30 sometime later this year.

- 1. GeForce4 Ti4600: This card is the top dog and runs at core speeds of 300 to 330 MHz. There is a whopping 128 MB of high speed RAM onboard, which runs at a blazing 650 MHz (128-bit 325 MHz DDR).
- 2. GeForce4 Ti4400: Using the NV25 core, it will run at a slower 275 MHz with 128 or 64 MB of RAM, depending on the card manufacturer.
- 3. GeForce4 Ti4200: Powered by the NV25 core, but runs at a more down-to-earth speed of 225 MHz, which is similar to the GeForce3 Ti500. With memory that runs at a slower 500 MHz this card will be much cheaper than the ones mentioned above and is a sure-shot bestseller.

The other members of the Geforce4



You won't see realistic reflections and ripples on water with just any old video card

family use the NV17 core, which means they lack the pedigree of the Ti4600. But they still pack a mean punch when compared to anything else available today, with the exception of the GeForce3 and the Radeon 7500 and 8500 models.

- 4. GeForce4 MX 460: This one runs at 300 MHz core and will contain 64 MB of RAM running at 550 MHz. The only

drawbacks are the slower memory and the lack of advanced features such as pixel and vertex shaders.

- 5. GeForce4 MX440: This part uses a 270 MHz core and 64 MB of RAM running at 400 MHz.
- 6. GeForce4 MX420: This is the ultra low-end solution that uses a 200 MHz core and 64 MB of 166 MHz standard SDRAM. This would probably be a successor to the GeForce2 MX200 cards, which are extremely popular today.

The GeForce4 MX has been at the centre of some amount of controversy. Gaming enthusiasts and developers alike have been shouting themselves hoarse that this isn't a real GeForce4. And they have a valid point. The NV17 core sadly lacks the Direc-

tX 8 pixel and vertex shader units. It can process only half as many pixels because it has just two pixel pipelines against the four that are in the NV25 core. This is a serious handicap and implies that the NV17 is not even equal to the GeForce3 in many ways. The only common features between the GeForce4 Ti series and the GeForce4 MX that are worth mentioning are the Light Memory Architecture II, the Accuvision AA engine, the nView support and the nVidia's Shading Rasterizer (NSR), which hails from the GeForce2 days.

So where are the games?

There is little doubt that the GeForce4 is brilliant in design and philosophy. But sadly enough the game development industry is moving at a pace that is a lot slower than what the graphics and PC hardware industry has set over the last few years. For instance, while the GeForce3 was released more than a year ago even today there are just a handful of games that can take advantage of its power. Games such as Medal of Honor: Allied Assault, Ballistics, Aquanox and Return to Castle Wolfenstein are among the handful that take advantage of all this new technology.

The real fun however will begin when games such as DOOM III and Quake IV make an appearance sometime next year. Nevertheless, the GeForce4 does allow you to take your present games and turn on every single feature you can think of, with absolutely brilliant image quality and zero 'jaggies' without any performance hit. Definitely something that gamers would consider paying big bucks for!

HATIM KANTAWALLA

| Is nVidia's GeForce4 the one for you? | | | |
|---------------------------------------|---|---|--|
| If you're a | Casual gamer | Game enthusiast | Hardcore gamer |
| And own | A card that runs at 800x600 with 16-bit colour without framing excessively such as a pre-GeForce card—Riva TNT2 or an ATi Rage128 | A card that runs at 1024x768 at 32-bit colour with some compromise on texture detail such as a GeForce, GeForce2 MX400 or ATi Radeon 7500 | A top of the line card which rocks with all settings pushed to the maximum and anti-aliasing enabled such as a GeForce3 or ATi Radeon 8500 |
| And want to play games like | Need for Speed III, Quake II, Half-Life | Need for Speed IV, Quake III, FIFA 2001, No One Lives Forever | Medal of Honor, Return to Castle Wolfenstein, Max Payne |
| You should | Stick with what you have | Get yourself one of the GeForce4 MX variants | Get a GeForce4 Ti series card and experience complete bliss |



TALK^{is} CHEAP

At long last, Internet users in India are being given the option of making inexpensive calls abroad. On April 1, Internet Telephony got liberated, and it is now poised to serve a nation starved for cheap talk

The world became a smaller place for Indians on Fool's Day, and we are not joking about it. After a prolonged wait, India opened its slumbering arms to embrace a phenomenon that's transforming the way people speak to each other.

To make things clearer, imagine talking to a friend in America for hours on end and paying next to nothing for it. Imagine calls so cheap that your local ISD PCO guy shuts shop! All this and more is possible through a single tech-

nology that has enjoyed immense popularity worldwide. VoIP, short for Voice over Internet Protocol, describes a set of facilities used to carry voice transmissions over the Internet. This technology encapsulates everything one would want in a means of affordable communication.

Behind the scenes

Before the embargo on VoIP was imposed and actually implemented, you might recall using sites such as *Dialpad* and *Phonefree* to touch base with friends and contacts abroad at no cost. After the collapse of the Internet economy, sites that offered free calls to certain countries now charge a few cents a minute on calls to the same destination. With the ban on VoIP dead and gone, you can officially purchase talk time from these sites and make calls without the guilt that you are doing anything illegal. The problem is you would require an international credit card to buy them. That's an inconvenience in a country that hasn't quite caught on to the concept. Fortunately, local service providers are stepping in to bridge this gap.

In the past year, ISPs across India have been clinching tie-ups, one after the other, with foreign technology partners in an effort to bring specialised service to *desi* Netizens. The ISPs are acting as more than mere middlemen here. Think of them as local partners of the services available overseas. With a regional presence, you'll experience better service and support than you would by directly approaching an IP telephony provider abroad.

How it works

Before diving into the nitty-gritty of how Net-based calls work, let's refresh your memory and run through the process of the standard, telephone-based call.

When a call is placed through conventional PSTN (Public Switched Telephone Network) lines, a dedicated link between you and the party you are calling is established. For the duration

// Service providers getting into this market (VoIP) for quick money are in for a shock and will be wiped out //

K.S. Shiva Kumar,
HEAD OF SERVICES, HCL INFINET

Flavours of Internet Telephony

PC-to-PC



PC-to-Phone



Phone-to-Phone



1. PC-to-PC calls have been made for years; no telephone, just the next best thing
2. PC-to-Phone calls are routed through special links to the telephone network
3. Though not available in India yet, Phone-to-Phone eliminates the need for an expensive PC

INFOGRAPHIC: Jaya Shetty

of the call, both ends of the conversation are engaged, leaving no room for communication outside the link. Telephonic dialogues are transmitted across the network at a fixed speed of approximately 64 kbps in each direction, giving a total broadcast speed of 128 kbps. In a typical conversation, most of the bandwidth is underutilised as there are pauses and other moments of silence. In one-way conversations, at least half of the available bandwidth is wasted while the other party is listening.

How to use it

If you want to set up Net telephony, the first thing you need is a computer. To make sure that it's outfitted with everything you need, here's a list of the essential components.

- Pentium II class CPU running at 233 MHz
- 128 MB RAM
- 16-bit full-duplex soundcard
- Microphone headset combo
- The latest version of your favourite browser

If you don't have a PC, you can still make VoIP calls using an Internet Protocol (IP) device, which will cost you something in the rage of Rs 3,000 to Rs 15,000 depending upon the handset and features.

In case you lack both, just walk into a cyber cafe and make the calls you want. For instance, Satyam Infoway plans to provide services to those who may not have PCs at home. The ISP, which runs the I-Way chain of cyber cafes, plans to outfit 700 centres with VoIP services.

Say for instance, you are loading a rather lengthy Web page. No matter how quickly the site may load, not all of the site data is sent across at once. Rather, the sending computer (server) dispatches the data in small packets with the address affixed to each one telling the network where to send them. The receiving computer receives these packets and reassembles them to form the site in its entirety. The whole process is extremely efficient; multiple connections can be simultaneously made to several computers at once with packet switching. It also minimises the time for which a connection is maintained between computers and this greatly reduces the load on the network.

VoIP employs this packet switching method to deliver many pluses over circuit switching technology. A single dial-up Net connection allows for many more calls in the amount of space occupied by a single call in a circuit switched network. For instance, a

A typical five-minute conversation would translate into roughly 4,800 KB, or 16 KB for each second that the circuits remain open. Keep in mind that these figures apply irrespective of whether or not speech is being transmitted over the lines. Imagine being able to view only one Web page at a time—that's how today's telephone networks operate.

Data based networks such as those hosted on the Internet do not use this type of dedicated circuit switching. Instead, data networks use a completely flexible means of sending information called packet switching. While circuit switching keeps a connection open and constant, packet switching opens a connection barely long enough to send a chunk of data from one computer to another.

Here is what happens between two computers over the Internet.

PHOTOGRAPH: Mexy Xavier

| A Look at Telephony Rates (in Rs) | | | | |
|-----------------------------------|----------|------|----------|-----------|
| | ISD | Sify | Caltiger | Net4India |
| USA | 45 to 50 | 7 | 3 | 4.95 |
| Canada | 45 to 50 | 7 | 3 | 4.95 |
| UK | 34 to 40 | 8 | 3 | 4.95 |
| Germany | 34 to 40 | 8 | 5 | 4.95 |
| France | 34 to 40 | 8 | 5 | 4.95 |
| Hong Kong | 23 to 27 | 9.5 | 5 | 5.46 |
| Australia | 34 to 40 | 8.25 | 5 | 6.55 |
| Japan | 34 to 40 | 7.50 | 5 | 7.64 |
| Dubai | 23 to 27 | 11 | 8 | 27.01 |
| Singapore | 23 to 27 | 11 | 8 | 4.95 |

As of now, only a few providers have their rates in place, which are subject to change

10-minute phone call over PSTN lines would occupy the entire bandwidth for the entire duration of the call.

With VoIP speaking the same language as the Internet, Internet telephony works the same way too. Each spoken word is turned from audible tones into scattered digital bits of data. These packets are then squashed to sizes (through a special speech compression formula) tiny enough for even dial-up lines to handle. It does compromise on speech quality to an extent, but that's a small price you pay for the money you save using IP telephony.

What's available

Internet telephony services can be broken down into three categories: PC-to-PC, PC-to-phone and phone-to-phone. Of these, PC-to-PC is absolutely free of cost. And with phone-to-phone being ruled out by the telecom regulating authority, PC-to-phone is the segment that ISPs have their sights set on.

Across the nation, ISPs are either gearing up to announce or

Looking Ahead

With a forthcoming slash in ISD rates, it's natural to wonder how successful VoIP will be in the long run. For now, we relish the luxury of VoIP only because it's comparatively cheaper than other options. But once the price gap starts to close, will our attitudes change as a result?

That's highly unlikely. VoIP offers too much in terms of cost benefits and flexibility in usage to be put aside and forgotten. In fact, telecom leaders in the West such as AT&T and MCI WorldCom, have gone as far as shifting their underlying infrastructure to VoIP technologies. So what does all this mean for us? Plenty. The next few years are crucial in widespread adoption of Internet telephony in the country. Visionaries can foresee PCOs functioning as long-distance call centres using this breakthrough in Internet technology. As the market opens and accommodates more players into the foray, the competitive spirit will lead to even greater improvements in voice quality and service, not to mention the imminent drop in calling prices.

With its future shining so brightly, it will soon be difficult to picture a life without VoIP. Considering its long-term cost benefits, we're at a loss to explain why it was shunned in the first place. But, as we said earlier, after April 1, the world is indeed a smaller place.

have already announced their VoIP packages ready for use today! Caltiger, Satyam Infoway and HCL Infinet are just a few of the ISPs that already have their services up and running. Each ISP that we've come across expressed an interest in presenting a pre-paid service model as opposed to a post-paid billing cycle.

Before you leap to the cheapest per-minute deal, you must exercise some caution. There is certainly some strong reasoning behind the price disparities—in a word, its quality. Details regarding how much bandwidth the service presently carries and who are its technology partners are some of the points that may explain higher rates charged by some service providers. In the end, it's crucial to experience the best sound quality possible, otherwise you would not catch every sigh, every nuance of the conversation while talking with people around the world. Before committing to a service plan, ask the vendor for a test drive. The ones who are confident about their service will oblige, those trying to pull a fast one on you will attempt to divert your attention.

A comparative look

For a country where ISD tariffs are higher than in most developed nations, Internet Telephony is welcome news in India. But as usual, anything the government declares legal seems to have a few strings attached. For starters, while you can call a PC or a phone in many countries across the world, you can't reach out and call the 36 million basic telephone holders in India. Nor will you be able to call the millions of cell phone subscribers. If you think that sounds ridiculous, here's the punch line: you cannot even place a call to the police or other emergency services! Within India, only PC-to-PC calls are permitted.

Aside from local call restrictions, there are issues of voice quality. Though a call overseas could be cheaper through VoIP, it'll lack the clarity of a telephone call. But for most people, a little static and noise interrupting their voice won't be a deterrent, considering the amount of money being saved.

Fortunately, bandwidth isn't a problem, not even in India. A somewhat clear and speedy connection to a phone in the UK—or any place else abroad—can be possible through a majority of the country's dial-up lines. For the most part, broadband users will experience the same quality of speech across their Net connections as any other. At best, a quicker connection would further eliminate sporadic break-ups in conversation caused by slowdowns in speed.

Getting down to it, perhaps the biggest con of VoIP is the need for a PC or an IP telephone; two expensive investments out of reach for many. No matter how cost-effective phone calls over the Net may be, factor in the price of a shiny new PC and then watch the scale turn against your favour. Unless you're constantly connected with foreign shores, it could be cheaper in the long run to just do it the old fashioned way.

Although it will take some time, eventually all circuit-switched networks will be replaced with packet-switching technology. IP telephony makes sense in terms of both economics and infrastructure requirements. More and more businesses are installing VoIP systems, and the technology will continue to grow in popularity as it makes its way into our homes.

PRASHANT MASRANI



PHOTOGRAPH: Mexy Xavier

Get Office XP's voice recognition working for you and give your hands that much needed break

Stop typing and start talking to your computer. That's the promise of voice recognition. The latest advancements in voice recognition software makes 'digital dictation' a reality. No more typing long letters and filling in humongous data sheets!

IBM's Via Voice, Philips Free Speech, and Dragon's Naturally Speaking are some of the software currently available in the market. Now even Office XP comes integrated with voice recognition capabilities. In this workshop, we guide you through the process of installing and working with the voice technology integrated in Microsoft's Office XP.

Installation

Voice recognition is not installed by default with Office XP. You will need to run set up from the Office XP CD. To install the feature, select 'Customize installation'. Now choose the programs that you want to install, i.e. Word, Access or Outlook. At the bottom, select 'Choose detailed installations of each application'. Click 'Next'. You'll now see a screen from where you can select the features you want

to install with each application. Here, navigate to the 'Office Shared Features' folder. You will find the option 'Alternative User Input' under which you will have further options of 'Speech' and 'Handwriting'. Click on them and select 'Run all from my



Installing the voice recognition feature

computer'. Follow the onscreen procedure to finish the installation.

Training the software

Voice recognition will only operate correctly if you train it, and you might have to invest considerable time with it to

increase the accuracy level. Before going ahead with the training program make sure you are in a quiet environment. Background noises make it difficult for the software to interpret words and you will have to speak louder. Remember to speak slowly and clearly and not to rush through the sample sentences, as the software may not be able to recognise all the words at the first go. Also, before proceeding with the training, remember to tweak the microphone sensitivity level. Double-click on the volume control icon in the system tray. From the 'Options' menu choose 'Properties'. Now select the 'Recording' radio button and click 'OK'. You can adjust the microphone level with the 'Microphone Balance' slider.

The first time you train the software, you will be asked to fill in details such as your age and gender. Next, you will have to speak into the microphone to test it. After this you will have to go through a training program wherein you will be prompted to read sample sentences. When you're done, click on the 'Finish' button to complete the training program. This is the basic training session. If you



Dragon Naturally Speaking 6.0

Dragon Naturally Speaking uses L&H Real Speak, Lernout and Hauspie's text to speech engine, which has received many awards from the industry for its superior technology. This engine is based on concatenation algorithms, where actual human voice segments are stored and are used to convert text into speech. Some of the striking features that make this program truly outstanding are:

NBS: A special tool called Nothing But Speech filters out gaps, and sounds like 'hmm', 'aaah', etc during dictation, thereby preventing the insertion of unnecessary words.

Different Modes: Unlike Office XP, this program provides specific modes for different types of tasks. For instance, there is a special mode that you can use to train the software for dictating numbers, thereby maximising accuracy.

Acoustic Optimiser: Most voice recognition software adapt to your speech with time, but this is a gradual process that needs a lot of training time from the user. The Acoustic

Optimiser lets you compile data in a single sweep thereby making the computer learn faster than it would through the 'gradual adaptation process'.

Add Contact Names: You can add names to the vocabulary list from Microsoft Outlook or Lotus Notes.

Navigate the Web: You can dictate URLs directly in the browser to navigate to the Web site of your choice.

Command Browser: It's possible to train commands for specific programs like Outlook, Word, Excel, etc.

Multiple Users: Every individual in the family can make their own personal profile and train the software accordingly.

Custom Macro Commands: There's a macro recorder that allows you to record custom commands that can be executed at any time.

Dragon Dictate includes a special Indian English installation that makes it easier for Indian users to train and work with it as they don't have to speak in a particular accent. It also features a comprehensive help system and a Microsoft Office XP like

toolbar. Even though its accuracy rate is much higher than Office XP, it still needs considerable training time.

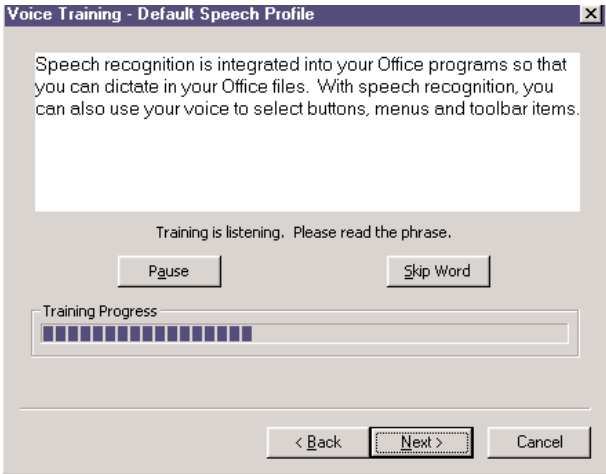
Apart from the professional version there are other flavours of the software that cater to specific professions—medical package, legal suite and public safety suite. The medical package, for instance, features support for generating medical reports, patient notes, and entering data into various forms.

On the whole, Dragon is superior to Office XP's voice recognition feature, even though it's more resource hungry.

| Dragon Naturally Speaking 6.0 | | B+ |
|-------------------------------|----------|----|
| Performance | ★★★★ 1/2 | |
| Ease of use | ★★★★ | |
| Value for Money | ★★★★ | |
| Features | ★★★★ | |
| OVERALL | ★★★★ 1/2 | |

Web site: www.scansoft.com
Price: Rs 33,408 (approx.)

SPECIFICATIONS
Minimum system requirements: P-II, 400 MHz processor, soundcard, speakers, 128 MB RAM, 300 MB HDD space, Win 95/98/2000/XP



Read sample sentences to train Office XP

wish to provide more training, you can use sessions such as Aesop's Fable and The Wizard of Oz at a later stage, to attain a higher accuracy level.

Speak your mind

Now that you've spent time training the software, you can dictate letters, close and open programs, give commands, feed in Excel sheets and create e-mails or Power-

Point presentations without making use of the mouse and keyboard! Here's how you go around accomplishing these tasks:

Dictation: Open MS Word and you'll find a Language toolbar at the top. If it doesn't show automatically, go to the 'Tools' menu and click on 'Speech'. On the Speech toolbar click on the 'Microphone' button and you will be able to see the 'Dictation' and 'Voice Command' buttons.

Click on the 'Dictation' button and start speaking slowly. You will see words on the screen, but there will be a small lag as this process is quite CPU-intensive and depends on your processor speed.

While you're dictating, the program will fail to understand several words, especially proper nouns, no matter how loudly or clearly you speak. You will have to manually 'Add' words so that the next

time you speak they are recognised. Click on the 'Tools' button on the Language bar and then click on the 'Add/Delete word' button. You will have to manually type in the word and then speak it out by clicking on the 'Record pronunciation' button. After it's recorded, the word is added to the dictionary. There is another option called 'Learn from document', which lets you add words that are not recognised automatically.



Drawing and Writing Freehand

You can write or draw with your mouse or PC tablet, using the 'Write anywhere', 'Drawing pad' and 'Writing pad' options on the Language bar. In order to write on the screen, select 'Write anywhere' and use your mouse to write.

If you would like to draw freehand diagrams, select the 'Drawing pad' option. There's even an on-screen keyboard, which allows you to type without using your actual keyboard!

The Driving Force behind Voice Recognition in Office XP

It's extremely difficult for a developer to build a speech engine that can understand virtually every word spoken. However, over a period of time software developers have been able to ensure an accuracy level that is above 95 per cent. Office XP's ability to understand and use spoken language is based on a Microsoft technology called the Speech Application

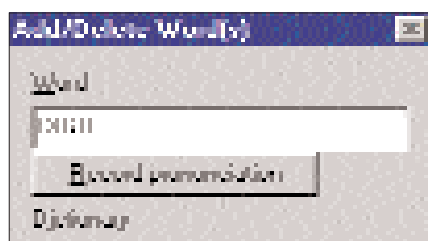
Programming Interface (SAPI) that's also being used by a growing array of independent software developers to speech-enable their own applications. Microsoft has been researching and promoting speech-enabled software since the mid-1990s, and its SAPI is the most popular PC-based speech-to-text and speech recognition interface in the industry.



The Minimum Requirements

for using the speech feature of Office XP are a Pentium II 400 MHz processor with 128 MB of RAM. You also need a high-quality close talk microphone, preferably a USB microphone with gain adjustment. SoundBlaster Live! is an ideal soundcard since it puts very little processing overhead on the CPU.

You can manually make corrections using the keyboard/mouse or by clicking on the 'Correction' button on the Speech toolbar even while you are dic-



Manually add/delete words

tating. The voice recognition feature can be used in other programs such as Excel, Outlook, PowerPoint or FrontPage wherein you can dictate numbers and even formulae into a spreadsheet or dictate the contents of a PowerPoint presentation.

Voice commands: You can open files or use any menu driven commands, by activating 'Voice Command' on the Speech toolbar. By simply mentioning the name of the menu, the menu list will open and all you have to do is speak out the specific command you want to use. For exam-

ple, if you want to create a new file you will have to say "File" and the file menu will drop down. Now say "New" and a new file will open.

That's it. You can now go ahead and talk to your computer. Remember, you would need to invest a lot of time in training the software to recognise your voice. Your initial experience might be frustrating, but patience is all you require. Soon all you'll need is a microphone, with the keyboard and mouse finding their way into the Recycle Bin.

MITUL MEHTA



1/2 page H. AD

Connect to CONSERVE

Save on resources with this workshop on setting up a LAN, sharing your Internet connection between PCs, and setting up a mail server

Many of us have more than one PC in our homes and workplaces. Having them wired on a network has several benefits that will allow you to utilise resources more efficiently. It's really quite easy to set up a network for simple tasks such as sharing files and folders, sharing a printer or even your Internet connection. You can even set up an e-mail server that automatically downloads mail for everyone and distributes it over the network. You will be surprised at the cost savings when you decide to share your resources.

Putting the pieces together

Now that you've got all the pieces for your network in place (*Check out the 'What you need' box for more details*), let's put them together.

First, identify the PC that will connect directly to the Internet. In case this PC has a cable or DSL connection you will need to install two network cards. If you're using a dialup modem you just need one network card per machine. Make sure that your PC has free PCI slots to plug in the cards.

Next, you need to connect the cables. Arrange the cables neatly such that they don't get cut between doors and no one trips over them. Now connect the two PCs with the crossover cable (or use a hub if you're connecting more than two computers).

Selecting the right driver

If you are using Windows 2000 or XP, the network cards should be detected automatically. If they aren't, you will

have to manually install the drivers using the installation disk that came along with the card. When you have done this, you will be asked to enter the computer and domain name. For example, let's name our domain 'MyNet' and the PCs as 'Home1' and 'Home2'. Home1 is the PC that is connected to the Net (the host) and Home2 is the client machine.

Setup your network adapter

Now that you've plugged in the network cards, you need to configure your network. Right-click on the 'Network Neighbourhood' desktop icon on Home1 and select 'Properties'. 'TCP/IP' should be the default protocol for your network. Ensure that you've installed 'Client for Microsoft Networks' and 'File and Printer sharing for Microsoft Networks'. Now select the 'TCP/IP' component and click the 'Properties' button. This brings up the 'TCP/IP Properties' dialog box. Click on the IP (Internet Protocol) Address tab and enter the IP as 192.168.0.1. In Home2, you need to enter the IP as 192.168.0.2. Also under the 'Gateway' tab of Home2, enter the IP of Home1, i.e. 192.168.0.1. The subnet masks for both the machines should be 255.255.255.0.

Those with cable or DSL connections will need to enter additional details such as the IP address assigned by the service provider, Gateway IP, and DNS server details for the network card (in Home1) to which the cable or DSL modem is attached. You can get these details by contacting your service provider. The client machine's settings remain unchanged (the same as mentioned above).

NATing it up

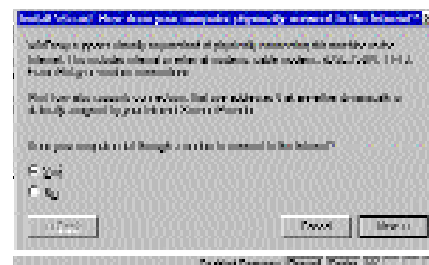
NAT (Network Address Translation) allows LANs to use two sets of IP addresses (internal and external) to access the Internet. An IP is your PC's address on the network (LAN or Internet). The external IP is the static or dynamic IP that your ISP assigns to you. Internal IPs are used by NAT so that other PCs on the network can access the Internet even though they aren't directly connected to the Internet. Whenever computers want to access the Net, NAT converts the internal IPs so that they can be used for accessing the Internet.

For our network, we'll be using a NAT-based proxy server. Proxy servers allow the sharing of a single Internet connection over a network.

Enter WinProxy

WinProxy is a NAT based shareware proxy server with support for internal and external modems as well as cable and DSL connections.

The configuration wizard will automatically start up when you launch WinProxy for the first time. You will need to specify whether your computer uses a modem for Internet access. Select 'Yes' if



Select your kind of Internet connection in WinProxy



What you Need

It's not very expensive to set up your personal network anymore and the amount you will save by sharing your resources will more than cover the initial cost. Here's a list of items you need to purchase:

Network Interface Card

Make sure you buy 10/100 Mbps network cards for your PCs as the price difference between 100 Mbps and 10 Mbps cards is almost negligible. Each card should cost about Rs 400 to Rs 600. If you are using a cable Internet connection

then the machine connected to the Internet will need two network cards. This makes a total of three network cards. Dialup modem users would require just two network cards.

Cabling

You will need Category 5 UTP cables (commonly known as Cat 5 cables) to connect the computers. Specify for a 'crossover cable' in case you plan to connect only two computers. Good quality Cat 5 cables start at Rs 25 per metre. Remember to measure

the distance between your computers and to buy a little extra cable, as it's better to have some left over cable rather than finding that the length has fallen short.

Hub

If you plan to connect more than two computers, you'll need a hub. Hubs help in transferring data between computers over your network. You can find different types of hubs with port counts of 4, 8, 16, etc. Nowadays it's quite easy to buy a four-port 10 Mbps hub for Rs 750.

you are using a dialup modem. WinProxy will automatically detect your dialup connection. Choose 'No' if you are using a cable or DSL connection.

This will take you directly to the 'Configuring your network screen'. WinProxy will automatically detect your internal and external IP addresses (depending on how you connect to the Internet, viz. dialup or cable/DSL) and set up the proxy for you.



WinProxy automatically detects internal and external IPs

After WinProxy has verified your settings, you can access the Internet from any machine on your network, provided you have set up your network as described in the previous section.

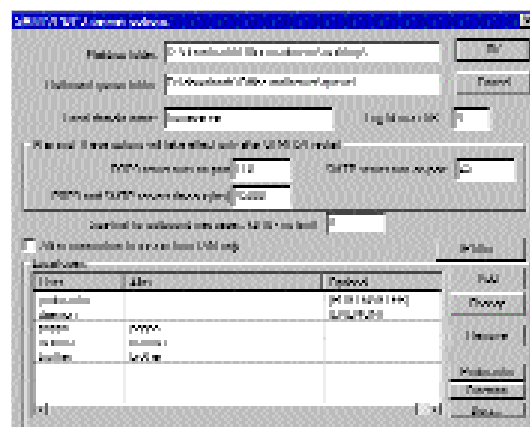
You've got mail

What if someone on the client PC (Home2) needs to send e-mail when the host PC (Home1) is not connected to the Internet? You might also want to send a Web link or some other information over the network. A mail server is an excellent solution for these problems. It will receive mail from all the PCs on the network and will relay them whenever the main server (Home1) is con-

nected to the Internet. Now you don't need to send local mail through the Internet and waste both your mailbox space and time. Instead, the mail server will automatically route them to the appropriate mailbox within the network.

Setting up the server

Office Mail Server is a simple, easy-to-configure, lightweight e-mail server. The server starts immediately without any cumbersome installation procedure. From the 'Options' menu select the 'SMTP/POP3' server options. Now we need to set up different user accounts and also configure the server to send and receive offline and online mail. The Maildrop folder holds all the mails that are downloaded from different accounts and the Outbound queue folder holds unsent messages. You can specify a different path if you want. The Local domain



Setting up user accounts in Office Mail Server

name will be the default domain name for all local mail. For example, if you enter 'homerserver' here, the local e-mail ID for all users will automatically become 'users@homerserver'. (See 'Setting your mail client' box for details on configuring your e-mail software to send and receive local mail).



Life's easier with ICS

If you're using Windows 98SE, 2000 or XP, there's no need to use a third-party software to share your Internet connection. These operating systems have in-built support in the form of Internet Connection Sharing (ICS).

ICS is not installed by default. It needs to be installed on the host computer i.e. Home1. To install ICS, go to *Control Panel > Add/Remove Programs*. Click on the 'Windows Setup' tab. Select 'Internet Tools' and click on the 'Details' button. Now select 'Internet Connection Sharing' and press 'OK'. Click on 'Apply' to finish the installation. Windows should

now ask for the Windows installation CD. The ICS wizard will automatically set up ICS for you. The only thing you need to remember is to make a 'Client Configuration Disk' when the wizard prompts you to. It saves time while setting up the client (Home2). Reboot Home1 after the installation is complete.

Now use the Client Configuration Disk to set up ICS on the client (Home2). Use the PING command to check if you can access Home1. At the command prompt type 'ping 192.168.0.2'. If you get a response, everything should be functioning okay.

1/2 Page V. AD



Setting your Mail Client

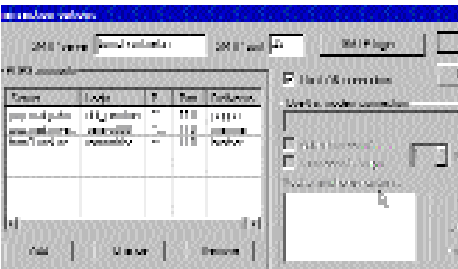
In Outlook Express choose 'Accounts' from the 'Tools' menu to add a new account. Enter 192.168.0.1 (IP address of Home1) as the incoming and outgoing server. Specify the account name and the password that you've set in the mail server. Now you can send and receive local mails even when you're not connected to the Internet. Remember, however, that all Internet mails will be queued in the server's Queue folder, but local mails will be immediately delivered.

Adding users

The postmaster and the daemon accounts are fictitious users that help send and receive e-mails. Make sure that you don't delete or modify them. Click on the 'Add' button to create a user account for everyone on your network. If you assign a user as Boss, a copy of every local mail will be sent to that person. Avoid this setting unless you want to monitor what mails go in and out of the mail server.

Set the delivery options

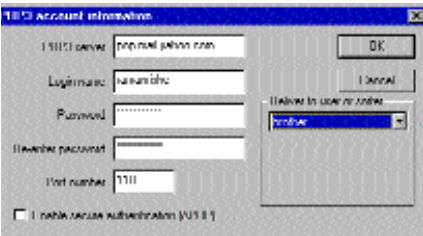
Now all you need to do is set up the e-mail account(s) from which mail will be downloaded. As soon as the mail from these accounts are downloaded, they will be delivered to appropriate users based on the transaction options you have set.



Set up your external POP3 accounts

based mail service provider needs you to login to use the SMTP service, click on the 'SMTP login' button and enter the necessary details.

Clicking on the 'Add' button will open a new window where you



Specify the address where mail should be forwarded

Once online, do a 'Send/Receive' from the main window and all your queued messages will be sent and all new messages from each of the POP accounts that have been set up will be downloaded. The mail will now be sorted and distributed as per your settings.

These are just some of the things you can do with your personal network. As you become more familiar you will be amazed at what can be accomplished when you connect to conserve resources.

ANIL PATRICK R. and VIDYARAMANAN S.





ILLUSTRATION: Solomon Lewis

Dot comUnity

Reach out to likeminded people online and share
your thoughts and ideas beyond the limitations of geography and time

An anonymous parent at the nephrology web (www.healthboards.com) quells his apprehensions about the immunosuppressant medications that her child is taking. Meanwhile, in the forums on *Gigpad*, Manowar is raving mad about the fact that Megadeth has broken up—"Let us not forget that the often forgotten Megadeth has sold more albums than Guns N' Roses". He falls into a dispute with Nolan, who insists that AC/DC is a mediocre rock band that

no one cares for. Anuradha logs in daily into her favourite newsgroup and networks with likeminded students on preparing for her Masters degree abroad. She finds out information on everything—admission processes, visa formalities and prospective roommates. The community section of *vault.com* helps jobseekers and employees of a company. At *f***edcompany.com*, a community that rose out of the dotcom crash, people are busy documenting the dotcom deadpool on a daily basis.

So what is an online community? A drop-in centre? A support group? A social network or a professional society? Online communities can be all of these. "I use mail and MSN Messenger service to keep in touch with my friends. But at a larger level, I love sharing my thoughts at forums and discussion boards. We started a close-knit e-group called Infopimps at Yahoo! e-groups. We're likeminded individuals, discussing current issues, books, and various other topics that crop



up from time to time," says Altaf, a Net junkie and founder of Infopimps.

A Web community is not very different from the ones in the real world. They are similar in terms of their social dynamics. Both involve developing a web of relationships among people who have something in common, ranging across the spectrum from a hobby, a life-altering illness, a political cause, a religious conviction, a professional relationship, or even socialising. The environment is electric, and the people are real.



Newsgroups

Newsgroups are a cross between public message boards and e-mail lists. You have to subscribe to a newsgroup and sometimes only subscribers can post a message. The different newsgroups are arranged according to a branching hierarchy. The main branches (alt, biz, comp, misc, rec, sci, soc, and talk) have their own sub branches.

To read newsgroup messages, you need a newsgroup reader. Often, these come with your browser (Netscape Messenger for instance) or your e-mail software (Microsoft Outlook). Subscribe to the newsgroup, download the 'headers' or title lines, and then read as many or as few of the actual messages as you choose.

DejaNews is a searchable archive of thousands of different newsgroups. If you want a flavour of newsgroup life, take a look there.

A worldwide system of discussion groups called Usenet is the most abundant source of communities. Whatever the topic, you'll find a newsgroup devoted to it. You post a message to a newsgroup and come back later to see if you've received an answer. Usenet is a near-anarchic, censorship-resistant, aggressively non-commercial entity that has generated more than 500 million messages in the last 15 years. Usenet has grown from its Unix background of programmers and network administrators and now reaches out to governments, mass media and financial circles.

- ✓ Simple to participate in
- ✗ Difficult to administer
- ✗ Heavily spammed

Log a Blog

Web logs are an interesting Net phenomenon. They are like traditional diaries, offering regular updates on the blogger's life. Still others are guided tours of the Web, offering links to noteworthy stories, sites and links to other blogs. Often what is written in them is of an intensely personal nature—not exactly the kind of things you'd tell someone the first time you met them. Yet these people share it with the world, as if there was no such thing as a secret.

Anyone with a Net connection and a computer can set up their own Web log at *Blogger.com*.

The most dedicated diarists—those with massive hits and the most links to

their sites—reach thousands of people each day. Their sites tend to combine the writing talent and insight of traditional columnists with the Web's informality.

One such popular blogging service, with a strong Indian subcommunity is *Livejournal*, a free service that allows users to keep and constantly update a Web journal. *Livejournal* allows private and public entries, and has a feature where you can set up a circle of friends. This is a great way to catch up with friends and acquaintances if you lead a rushed life. Each blogger can even maintain a friends list, so that you can see what your friends are doing, at a glance.



Forums and discussion groups

Discussion groups linked to a specific Web site are quickly becoming the standard for site-based virtual communities. As in e-mail and newsgroups, you post a message to a discussion group and read the response later.

You can participate in Web-based discussion groups on any site that hosts one, and even build your own either by hosting it yourself or by using one of the many free discussion group tools such as EzBoard. EzBoard is the leading online community service on the Net, with over 1 million communities created and over 8 million registered users. You can use EzBoard to add a free message board service as a seamless addition to your Web site.

Forums foster a tight community where conversations are more focused than you'd typically find on Usenet and e-groups. Forums require the reader to visit a Web page to read (and reply) to messages. It's also a more 'passive' technique—discussion forums sit there waiting for someone to show up to read and post comments.

- ✓ Great for social conversation and in-depth discussion of issues one considers important

- ✓ One can often see a number of messages on one HTML page

- ✗ Difficult to come to some kind of resolution of the ongoing discussion
- ✗ Difficult to find specific information at a later date



Chat rooms

Chat rooms are the quickest way to connect with people on the Net. Besides traditional chat rooms, there are rooms where you can move through a graphical world and others where you can build your own text-based world.

Messages exchanged in chat rooms are usually limited to one-liners. They are best used for social purposes and not for exchange of information and views. Some online communities have chat based on IRC, which allows more or less universal access; even a Java applet can get you connected to a chat channel.

- ✓ Real-time discussions
- ✓ One can log the transcript to be posted later
- ✗ Difficult to schedule a time if you have users from around the globe
- ✗ To be useful, it needs a dedicated group of users





Mailing lists

An e-mail discussion within a group of subscribers is the simplest and most familiar form of a virtual community. Anyone who can read and send e-mail can create a mailing list virtual community.

OneList, eGroups, ListBot, Cool List, and other free list-hosting sites let you search among the lists hosted on their site. Once you register and sign up for a particular group, you are on its mailing list. You can view messages on the group pages, read them in your inbox, post messages, reply collectively or individually, and more. On Yahoo! Groups (<http://groups.yahoo.com>) you can also have separate pages for members, polls, chat, etc. You can share photos and files, plan group events and network like never before.

Assuming you have Internet access, the only investment needed to start a mailing list or e-group is time. It's necessary to invest time—moderating a list, starting and maintaining discussion topics and so on, do require a modicum of skills and takes no little effort.

- ✓ Messages come to your e-mail box
- ✓ It's inexpensive—messages can be composed and read offline
- ✓ Reach: you can reach virtually anyone who's online
- ✗ Spammers can send messages to the list and gather e-mail addresses for advertising purposes
- ✗ Often a talkative group can quickly produce a daunting number of messages

Making online communities work for you

The type of community that's right for you depends on your needs. If you're just starting out and don't have a lot of traffic, you can launch an e-mail list or a guest book. If you have a high-traffic site, think message boards and chat rooms. Most hosting services don't charge too much, so it's easy to register with several of them and test them for a few weeks.

You'll quickly be able to assess the features of each service and decide the best fit for your needs. Community-building tools include e-mail, newsgroups, chat and message boards. Each has its advantages and disadvantages.

Internet access, access costs, computer and browser types, geographic and time zone issues all affect the means adopted by online communities to interact. People with high Internet connection costs might be best off using e-mail, e-mail topic subscription features, and newsletters.

If you're discussing sensitive or private issues, as might be the case in an

Online communities: vapourware?

Weblogs, journals and forum sites all tend to form the basis of these new communities, both because of the abundance of free, easy tools to generate them and the relative lack of effort required to maintain them. Thus, communities spread throughout the Internet, even while actual original content dwindles. The truth is that people make communities. However, the mere presence of a bulletin board with a few posts, or a chat room does not mean that people are forming anything worth the word 'community'.

"At MouthShut, we provide a common theme of consumers helping others



Douglas Rushkoff
AUTHOR OF *CYBERIA:
LIFE IN THE TRENCHES OF
HYPERSPACE*

"I do believe we are in the midst of a transition—intimated by the Internet—towards a more collective thinking, where the individual psyche becomes a component of a larger group mind. This doesn't mean we stop existing as individuals, but it could mean we become more fully aware of every other living being, much in the way a coral reef's individual organisms respond to one another as if they were part of the same, single body

illness-support group, or a business work-group, you may want to develop a private community. If you want to attract new and diverse members and ideas, you should choose a public community.

Using free services has worked well for most people. After all, for many individuals a free service is the only viable option. There are Yahoo! Clubs, Excite Clubs, Microsoft Communities, and Altavista Communities, to name a few. Each offers its services for free.

But more than anything, building your own community requires planning and vision. "First, understand your target audience and see what they need and what they lack. Make sure your community offering is strong enough to keep them coming back—not as passive observers but as active participants. Make sure that your moderators are in tune with the community you are building," says Web strategist, Lyndon Cerejo.

decide whether a product or service is good or bad. We are able to maintain 'stickiness' in our model by providing a complete user experience. The instant feedback among our members is what takes interactivity to a higher level and the attachment with the community only intensifies as one grows with it," says Faizal Farooqui, CEO of Mouthshut.com.

Cerejo says: "A loyal community of users creates the 'goodwill' that you see on a company's financial statement—it may not be hard cash, but it contributes to your value. That is from a purely non-commercial view."

It's a truth that applies to almost all online communities. Online community companies, from Talkcity to iVillage, are supported by volunteers who spend their free time maintaining the communities they love. The bottomline—it's people who make or break the communities. ■

SRIRAM SHARMA



30 Minutes Expert Backup Plans

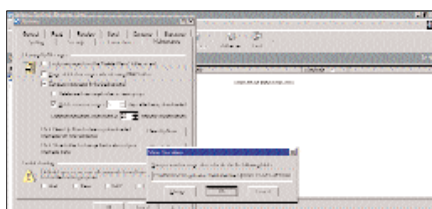
So you have a backup of all the data in your computer. But can you say the same about your e-mail? Your mail could go missing if in one of your more lightheaded moments you let your fingers wander over the keyboard or mouse and accidentally click on delete. Or they could be lost if your hard disk decides to belly up and crash. Whatever the case, keeping a backup of your correspondence is all too vital.

Outlook Express is one of the simplest e-mail clients to use, and when it comes to backing up mail, it's no different. Just follow these steps and you'll be safely through.

STEP 1 Create a new folder in a separate partition and then start Outlook Express.

STEP 2 Select *Tools > Options* in Outlook Express.

STEP 3 Click on the 'Maintenance' tab and then on the 'Store Folder' button. This will bring up the 'Store Location' dialog box. The path displayed here tells you where all your mail is currently stored.



Change the path where the mail is stored



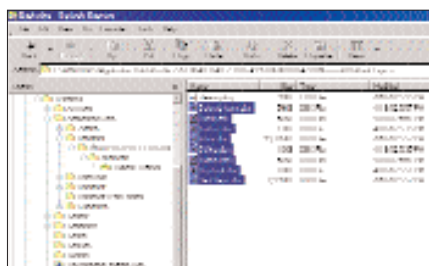
Remember that it is best to store your mail on a separate partition or another hard drive, one not containing the OS. This is to avoid any mail loss in case your OS gets corrupted.

STEP 4 Click on the 'Change' button. This lets you choose a new location for storing your mail. Now, select the new folder you created. You will see the 'Store Location' dialog box again with the new location when you are done.

STEP 5 You will be prompted to relaunch Outlook Express for the change in location to take effect. Do so, and you will find that your e-mail files have been moved to the new folder.

STEP 6 To do an actual backup of your e-mail, go to Windows Explorer and navigate to the new e-mail folder.

Backup the contents of the entire folder (the files will have a .dbx extension) to another location so you can access them later if something goes wrong with your Outlook Express. It is



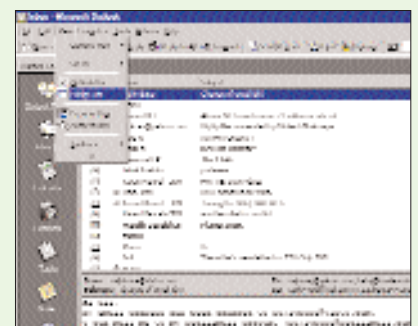
Copy the .dbx files and take backups

advisable to back it up on a CD-RW or CD-R disc so that in case your hard disk crashes, your mail data is not lost. Congratulations. You've now backed up your mail! Easy, wasn't it?

ANIL PATRICK R.

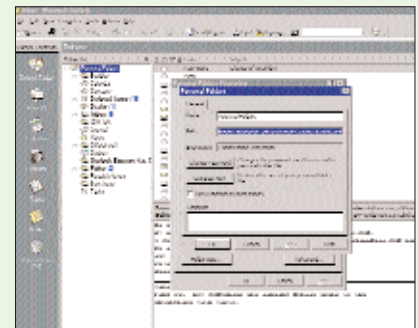
Backing up in MS Outlook

STEP 1 To backup mail in Microsoft Outlook, go to *View > Folder List*. This will show you the list of all the mail folders you have.



Select *View > Folder List* to see the mail folders

STEP 2 Right-click on 'Personal Folders'. Select the 'Properties for Personal Folders' option and click on the 'Advanced' button. This brings up the 'Personal Folders' dialog box.



Copy the path where your Outlook.pst file is stored

STEP 3 Copy the path of the folder in which the Outlook.pst file is stored. This file contains all your mail. Make sure to click on the 'Compact Now' button to reduce the size of your personal folder. Now in Windows Explorer, navigate to the Outlook.pst file and copy it to another location. Click on 'OK'. You now have a backup of all your mail.



Kernel errors, music CDs that won't play, blurry monitors, troublesome Linux installations and other grievances that need a fix

Software

Kernel error

Q I am using a Compaq system with 256 MB of RAM and a 433 MHz processor. Recently when I started my system I got an error, which says 'Error loading kernel. You must reinstall Windows.' Please help me.

Saurabh

Via e-mail

A The reason you're receiving this error is because the Kernel32.dll file is missing or is damaged. To resolve this problem you will have to extract a new copy of the Kernel32.dll file from your original Windows CD-ROM. To do so, follow these steps:

Restart your computer, press and hold down the [Ctrl] key while your computer restarts until you see the Windows 98 Start up menu, and then choose 'Command Prompt Only'. If you are using Windows Millennium Edition (Me), start your computer with the Windows Me start up disk.

Type the following commands, pressing [Enter] after each line:

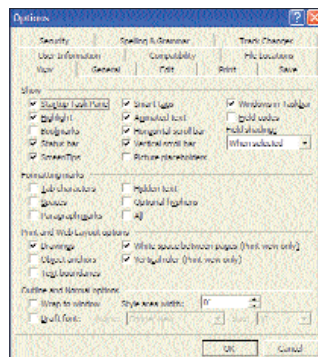
```
cd\windows\system
ren kernel32.dll kernel32.xxx
Extract a new copy of the
```

Kernel32.dll file from your original Windows disks or CD-ROM to the *Windows\System* folder.

Restart your computer once again and you should be able to boot without any errors.

Cannot view inserted images in WinWord

Q I recently upgraded my operating system to Windows XP and my Office 2000 package to Office XP. Previously I could place images in the WinWord program, but when I try to insert images now, only a thick black border appears. However, I can insert images in all the other programs of Office XP and they appear fine. I uninstalled and reinstalled Office XP but the



Uncheck the option of place holders to view your images

result is the same. Please solve my problem.

Sanjay

Via e-mail

A You need not reinstall Office XP. All you need to do is open the WinWord program, and go to *Tools >*

Options > Picture Placeholders. Uncheck this option and you will now be able to view the inserted images in the document.

Can't upgrade to XP

Q I am using Windows Me as my operating system. But

Installing the Penguin

Q I use a Pentium III processor with Windows 98 as the operating system. I have only one primary drive (C:\), 64 MB RAM and a 20 GB hard disk. Now, I want to install Red Hat Linux 7.1 on my PC. I am confused about it as some people suggested that I install it with the help of Partition Magic. Will I need to format my primary drive completely or can I simply install it. Please suggest an easy way to install Linux.

Jinal

Via e-mail

A To install Linux on your machine you will require some unformatted space; only then will you be able to install it. You can create unformatted space (i.e. by creating a partition) through Fdisk or any third-party tool such as FIPS. After doing that boot through the Linux CD and install it in the unformatted space. That will do it and you don't have to worry about formatting your primary partition for it.



when I tried upgrading to Windows XP, I got this error: 'Cannot get main entry point for C:\WINDOWSSYS-TEMP\VIPERSTI.CPL. Error:127 [ERROR=127 (7Fh)]'. As a result, I cannot finish my upgrade. Please solve my problem.

Astha Jain

Via e-mail

A This occurs if Windows Setup does not delete all of the files in the `WinDir\System32\Catroot2` folder while removing the earlier version of Windows. WinDir is the Windows installation folder. To work around this error, manually delete any files that remain in the `WinDir\System32\Catroot2` folder.

This error can also cause your machine to restart constantly and if this is the case and you cannot use the interface to clear the Catroot2 folder, you must delete the files from a command prompt.

To gain access to a command prompt, start the computer either from a Windows 98 or Windows Me boot disk, or from the Windows XP CD-ROM. At the command prompt, type `cd\windows\system32\catroot2`, and then press [Enter]. Type `del *.*` and then press [Enter] to clear the Catroot2 directory. Now try installing Windows XP and it should work fine.

A sound problem

Q When I use Windows Media Player to play high-quality video or a DVD, the audio quality is extremely poor, and sometimes garbled. Strangely, this does not occur with lower quality video. Why is this so?

Ravi

Via e-mail

A This happens if you use NeoMagic video adapter drivers. Some of the NeoMagic

MP3 songs refuse to play

Q I have a huge stack of MP3 songs on my hard disk. Since I recently purchased a music system capable of playing MP3s, I decided to burn them on a CD so that I can play them on my system and also free some hard disk space. After burning them I found that my music system couldn't play them. However,



ILLUSTRATIONS: Prashant

when I inserted the same disc in my computer it plays fine. Is my music system defective? Please help me.

Parag

Via e-mail

A No, your music system is not defective. The reason it is not playing your MP3 CD is because you have probably burnt the CD at an extremely high rate. Burnt it again at a speed of 4x and it should play without a problem on your player.

video adapter drivers are not fully compatible with Windows XP. Note that this issue can also occur with other video adapter drivers that are not fully compatible with Windows XP. To work around this issue, try either or both of the following methods:

- Reduce video hardware acceleration in Windows Media Player. To do this, in Windows Media Player, click 'Options' on the 'Tools' menu. Click the 'Performance' tab. Under 'Video Acceleration', move the slider closer to 'None' and then click 'OK'. Note, however, that this procedure may cause poor video performance.
- Alter the Display Settings. To do this, click on 'Start', and then 'Control Panel'. Double-click 'Appearance and Themes', and then double-click 'Display'. Click the 'Settings' tab. Click '16-bit, 24-bit, or 32-bit colour quality'. Click 'OK'.

Now you shouldn't face this problem any more.

No path found

Q I am using Windows XP. Of late, whenever I try to open any program I keep getting this error: 'The specific path does not exist. Check the path and try again.' Now I am unable to open any program.

Help required urgently.

Vivek Kapoor

Via e-mail

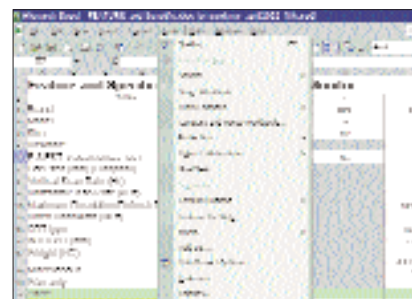
A It seems your machine is infected with the SirCam virus because of which you are getting this error. You can go to www.pandasoftware.com and download the removal tool from the Web site. Running this tool will remove all traces of the virus and you should not receive this error again.

Error Checking command

Q My problem is that when I enter a formula error such as 'divide by zero' into a spreadsheet cell in MS Excel, the Error Checking Smart Tag (the floating command and message box) does not appear as expected. Also, the Error Checking command is not available on the 'Tools' menu. Why does this happen?

Vikas

Via e-mail



Enable Error Checking in Microsoft Excel

A This problem occurs because Error Checking is not available when a workbook is protected or shared. To solve this problem, unshare or unprotect your workbook. (You will find the necessary options in the 'Tools' menu).

Blebla attacks

Q I have a Pentium III 800 MHz system with 128 MB RAM, and a 20 GB hard disk. Whenever I access a file with extension JPEG, BMP, EXL or DOC, it gets converted into a '.exe'. While scanning my PC with Norton Antivirus 2001, a message was displayed, 'Unable to repair the file c:\windows\sysrnj.exe. It is still infected with the W32.Blebla.B.Worm virus.' After I quarantined this file I have been unable to run any program and it displays a message, 'Windows cannot find sysrnj.exe file'. How can I solve this problem?

W32.Blebla.B.

Worm is an update of the W32.Blebla worm. It usually arrives in an e-mail that has an HTML body and two attachments. When you read the message, the two attachments are automatically saved and launched.

To completely remove this worm from your machine, follow these steps:

Shut down your computer and then restart after a minute or so. Boot in safe mode and then go to MS-DOS prompt. Type *copy regedit.exe regedit.com* and press [Enter]. (*C:\windows > copy regedit.exe regedit.com*)

Start regedit. Go to HKEY_CLASSES_ROOT*.exe (.exe and not exefile further down in the list). In the right side of the window double-click on 'Default' or 'Standard'. Next, in the 'Edit' dialog box, delete the value corresponding to exefile and click 'OK'. Navigate to HKEY_CLASSES_ROOT\rnj-file and delete rnjfile.

Select the Edit menu, click 'Find' and in the dialog box enter *rnjfile*. Now all the infected keys will be shown one by one. Change the key and press [F3] to go to the next key till no trace of this file remains. Now restart your computer.

You should also look for files such as *xromeo.exe*, *xromeo*.**, *xjuliet.chm*, *xjuliet*.**, *Sysrnj.exe* and *sys-rnj*.**, and delete them from

Fuzzy monitor

Q I have a 15-inch monitor with a Pentium III based machine. I recently got a cable Internet connection and also purchased a four-point Jetway Artis speaker set. I usually keep my computer on the whole night, as I download something or the other. In the morning when I try to use the computer I have to degauss my monitor as the screen looks hazy view and blurred. Why does this happen? Is my

monitor about to conk off?

Rahul Lobo

Via e-mail



A There is nothing wrong with your monitor. The problem you are facing is because of the placement of your speakers. You have probably placed the speakers or the sub-woofers extremely close to your monitor. The high magnetic field emanating from the speakers causes your monitor to get a blurry look. Place your speakers further away from your monitor and your problem will be solved.

your system. Now your machine will be completely rid of this virus.

Hardware

Bringing the scanner and printer together

Q I have a Pentium III 500 MHz machine with 128 MB RAM and an inkjet printer. Recently I purchased a scanner with a parallel port interface. My machine has only one parallel port. How do I access both devices at the same time?

Pooja

Via e-mail

A All scanners that use the parallel port have two parallel ports at the back panel. One is marked 'To computer' and the other, 'To Printer'. All you need to do is first detach the printer cable from the computer and reattach it to the scanner. Then take the scanner cable and attach it to the computer. This way the scanner mediates between the printer and your computer, and both devices can be used simultaneously.

Unwanted lines

Q I have a UMAX 2000P

scanner, which has been used only occasionally and hence, is as good as new. But of late it has been showing regularly spaced, light, horizontal, straight lines on the scan. The machine is otherwise working perfectly. What could be the cause for these lines and how do I remedy this? The scanner has been installed using its original CD. Does it need a downloadable driver(s), which could improve its performance?

R.M. Pradhan

Via e-mail

A The problem is not driver related. Dust has probably settled on your fluorescent lamp or there might be a problem with the CCD, which is unable to process the full data. As a result you get those lines across your scans. You should get the fluorescent lamp cleaned, but since this is a sensitive component and involves opening up the scanner, consult an authorised technician to solve your problem.

Serial port disabled

Q I have recently purchased a new machine. I connected my mouse to one of the serial ports and my modem to another. My problem is that my modem does not get detected at all.

DVD won't play

Q I recently bought a DVD and played it on my DVD drive for the first time. I have a licensed Cyberlink ASUS DVD 2000 DVD player. With the help of DVD Genie I found that the DVD was not region specific. But whenever I played the DVD, it would play for around 10 to 15 minutes, or sometimes longer, and then the computer would hang. I have tried to play it repeatedly, but to no avail. I downloaded a program called DVD Info from www.visualdomain.net, which described my DVD drive as RPC2 locked and the default supported region is 5. I tried



changing the region settings through DVD Genie, but there's no difference. The DVD I purchased works perfectly on my friend's PC. Please suggest a solution.

Salroy

Via e-mail

A There is nothing wrong with your DVD player or the DVD you purchased, as it plays fine on your friend's system. The problem lies with your system. Playing a DVD involves high CPU utilisation and if your

machine hangs after 15 minutes of play it clearly indicates that your CPU or your system is not being cooled sufficiently. As a result your machine hangs. Check to ensure that there are no gaps between the heat sink and the CPU.

FAQs

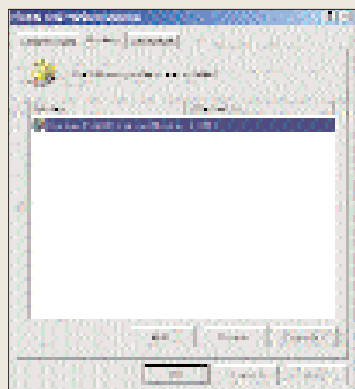
Initialising the modem in Windows 2000

Q. My PC has a Pentium III 933 MHz processor, 256 MB RAM, and a 48.5 GB hard disk. I have Windows 2000 installed. I have a 33.6 bps external modem. I want to know how to initialise my modem when Windows 2000 is already loaded. If I forget to put it on, I have to restart my computer to get my modem to work again.

Paras Barot

Via e-mail

A Unlike Windows 98/Me, even though your modem is installed you will have to switch it on when Windows 2000 loads, else you will have to go through the process of restarting the machine. However, there is a solution wherein you can fool Windows. Go to *Control Panel > Phone and Modem*



Initialise modem in Windows 2000 without restarting your machine

However, when I unplugged it and connected it to serial port1 it was detected and worked fine. Then I plugged in the mouse to serial port2, but my system failed to detect it. Is my motherboard defective?

Subash

Via e-mail

A To solve your problem, first go to your BIOS (press

Options. Click on *Modem > Add*. It will prompt you to add a modem. Click on 'Next'. Since your modem is switched off, Windows won't be able to detect a new modem and will automatically accept your previous modem as currently installed. Now without rebooting your machine you can make Windows 2000 detect your modem and connect to the Internet.

Creating PDF files

Q. I installed Adobe Acrobat 5, but I am unable to create any PDF documents. How can I create PDF files?

Sudhir

Via e-mail

A What you are referring to is Adobe Acrobat Reader. This application only allows you to read PDF files. To create PDF files you will need Adobe Acrobat PDF writer. This is available for around Rs 12,500. As an alternative, Adobe also provides a service where you can create PDF files online, for which you can choose a monthly or yearly subscription. More details are available on Adobe's Web site www.adobe.com.

[Del] when you get the Power On Self Test (POST) screen during bootup) and check whether your serial port is disabled. It probably is disabled, and as a result any device attached to it does not get detected. In case it is not disabled then you should contact your hardware vendor and ask him to send the

motherboard to the RMA centre for thorough testing.

What is STR?

Q. I recently purchased a new motherboard on which was clearly mentioned 'STR'. I would like to know what it actually means and whether it improves the performance of the motherboard.

Sushma

Via e-mail

A Suspend-to-RAM (STR) allows your system to enter a low-power state. To enable it, go to the BIOS (press [Del] when you get the Power On Self Test (POST) screen during bootup), and under 'Power Management' enable the Suspend-to-RAM option.

Once it is enabled, information on system configuration, open applications, and active files are stored in the main memory (RAM), while most of the system's other components are turned off.

A system in STR can use as little as 5 watts of power, with most of it going to the main memory for data maintenance. When left in this state, a system may be programmed to waken, so it can perform tasks at any given time.

If the power is interrupted, then the system will undergo a normal reboot, restoring full power to the machine and any information not saved to the hard disk will be lost.

Drained motherboard battery

Q. I have a Pentium III 550 MHz PC, which is around one-and-a-half years old. While booting my PC, I receive this message: 'Please check CPU speed and press any key to continue.' After

pressing a key it goes into setup mode. I quit without saving and it goes back to normal. The time clock also runs slow and shows the wrong time and date, in spite of the fact that I set it right every now and then. Please help.

Mukesh C. Bhatt

Via e-mail

A In order to solve your problem all you need to do is change your motherboard battery.

System performance below par

Q. I have recently purchased an Athlon 1800+ system. However, I find that the performance of this PC does not match your results (mentioned in the January 2002 issue).

Furthermore, games crash or give an extremely unplayable frame rate. The processor temperature is absolutely normal as my machine is rock stable. What could be the problem?

Garry

Via e-mail

A Your system does not generate the scores as per our test because you haven't installed the latest VIA four-in-one drivers.

These drivers contain updates, which include four system drivers, to improve performance and maintain the stability of systems using VIA chipsets.

These four drivers are: VIA Registry (INF) driver, VIA AGP VxD driver, VIA ATAPI Vendor Support driver and VIA PCI IRQ Miniport driver. After installing this set of drivers your system should give you optimum performance.



Send your problems to sos@jasubhai.com or write to Digit, D-222/2, Om Sagar, MIDC, Nerul-400 706

tips & tricks

PC Makeovers

Spruce up your PC! Make it look funkier and better than your friends' desktop. Get a complete image makeover with wallpaper randomisers, jazzy screensavers, innovative start up/shutdown messages shell replacements and much more...



ILLUSTRATIONS: Prashant



Tips & Tricks
On speeding up
your PC
FAQs on printers
Plus **software** for
PC Makeovers

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What's so SPECIAL about the
June issue of digit?
>>>Your Technology Navigator

COSMETIC BOOSTERS

Use wallpaper randomisers to frequently change your wallpapers and also alter the frequency mode and effects

BackFlip

This nifty program allows you to change wallpapers at specified intervals. It offers a wide slicing of time, ranging from a few seconds to a few days, and it's easy to install and configure

■ Setting the source

Click on the system tray icon to launch BackFlip. Click on the 'Source' tab. Now, add an image, an entire folder of images, or the URL of a wallpaper site in the images library. There are a few wallpapers in BackFlip's image library but they're not stored locally. The source points to an FTP site on www.fcodersoft.com.

The last icon on the menu, which resembles a monitor, allows you to select an image and set it as the current wallpaper. The 'Pause' button allows you to suspend or continue the wallpaper cycling session.

■ Changing display mode and effects

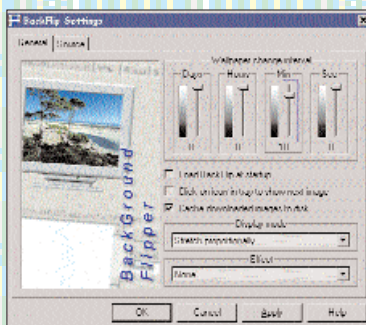
Wallpapers can be a mix-and-match of different resolutions. You can stretch the wallpaper to fit the desktop, use the tile option, or keep the wallpaper in the centre using the 'Display mode' option in the 'General' tab. You can also choose from six different effects in the 'Effects' drop down list.

■ Setting the frequency

The 'General' tab in the BackFlip window allows you to set the time interval (seconds, minutes, hours or days) for cycling the wallpapers. Just pull down the slider on any of the four 'Change interval' options and set your preferred interval for the wallpaper change.

■ Cache images

When you add URLs to the image library, the software tries to fetch the image from the Web site every time while randomising, thus the image takes much longer to load. In order to reduce the time,

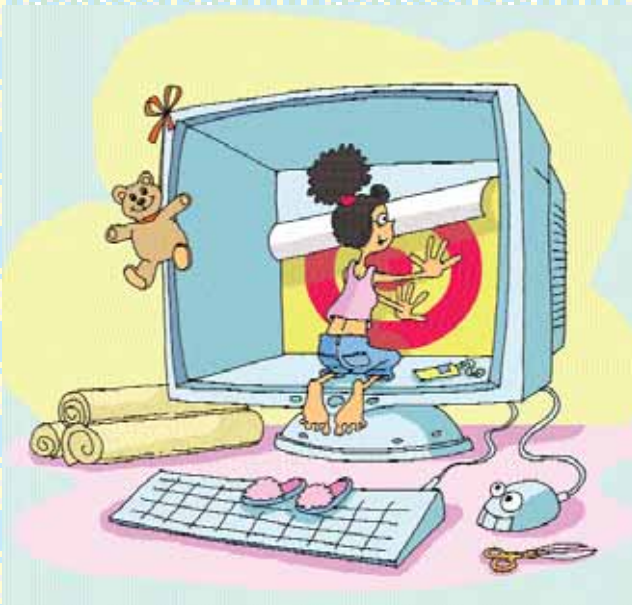


Set the interval for change

choose the 'Cache downloaded images to disk' option from the 'General' tab and the image will be loaded in a jiffy the next time the software tries to seek an image during a cycle.

■ Stop randomising

At any point of time if you



need to stop the wallpaper cycling, right-click on the BackFlip icon in the system tray and choose 'Suspend Show'. You can resume the cycling process the same way by clicking the 'Continue show' option.

WallMaster

WallMaster is another great wallpaper randomiser. This software has some neat features that BackFlip lacks. Use them to your advantage

■ Clear the wallpaper

If at any point of time you do not want any wallpaper on your screen, simply right-click the WallMaster icon on the system tray and choose 'Clear Wallpaper'. This will show just the background colour on your desktop.



Go slow

■ A new wallpaper every few minutes looks nice. But when the software is loading the image, your PC tries to repaint the entire screen with the new image. This takes CPU time and your PC might slow down considerably. You might even notice flickering or some distortion on the screen. Hence, it's advisable to set longer cycling intervals, say in the order of 15-20 minutes.

■ Though wallpapers are pretty add-ons, they are heavy and your computer will take longer to boot up. If you are performance conscious, avoid wallpapers.

5 FREE CDs



WITH THE JUNE ISSUE OF **digit**

Chiming at change

WallMaster has an option that allows you to play a sound while a wallpaper changes at the specified interval.

To enable sounds, right-click the WallMaster icon in the system tray, choose 'WallMaster control panel' and click on the 'Options' button. In the window that pops up, select the 'General' tab, and click on the 'Play sound when wallpaper changes' checkbox.

Below the checkbox is a text area where you can key

in the location of the WAV file to be played when the wallpaper changes. Alternately, you can browse to select the WAV file you want to play.

Cool sites

www.wallpapers.com
www.digitalblasphemy.com
www.visualparadox.com
www.wapers.com
www.webshots.com
www.wallpapercentral.com

STARTUP/SHUTDOWN SCREENS WITH A ZING

Weary to the bones with that same dreary 'default' Windows look? Change it now! Use Startup/Shutdown screen randomisers



1st Impression

1st Impression is easy to install and configure and has plenty of preset images which can be used as logos. It also allows you to convert images into a logo format for

use as a startup/shutdown screen

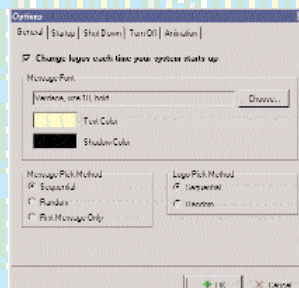
Add your own images

With 1st Impression, you can choose any image as a logo for the three screens: startup,

standby and shutdown. To add your own image to the gallery, press [A] or click on the '+ Add' icon on the menu bar. This opens a browser window. Navigate to the images you want and click on 'Open' to add them to the gallery. When the images are added to the gallery they are toned down to suit the logo format, so don't panic if they appear a little dithered. Next, click on 'Set icon' in the menu bar. In the window that pops up, choose whether you want to set the selected image as startup, standby or shutdown screen.

Randomising

You can easily configure 1st Impression to randomise



Enabling screen randomisation

or cycle the startup/shutdown screens. In the main window, choose **Tools > Options/Messages**. Then click the 'General' tab, and click on 'Change logo each time your system starts up' checkbox. The startup/shutdown screen cycling is now enabled. To set the mode for cycling the image as sequential or random, under the 'General' tab, click on 'Logo Pick Method'. By default,

'Sequential' is selected. If you prefer a 'Random' order, choose that option from the group.

Adding smart lines

If you want to add quotes or snappy lines to your startup/shutdown screens, 1st Impression has a default collection of one-liners for all three screens.

Choose **Tools > Options/Messages** from the menu. In the window that opens, select the 'Startup', 'Shutdown' or 'Turnoff' tab to see the text collection for that screen. To display any of these lines on your startup/shutdown screen, ensure that the check boxes on the relevant tabs are selected. You cannot change any of the text listed in this window. For text cycling, choose 'Sequential' or 'Random' under the 'General' tab. You can also set the text colour, font and size from the 'General' tab.

Adding more text to quotes

If you want to add more text to these screens you can do so from within 1st Impression. Navigate to the directory of 1st Impression within Program files. The default directory would be 'C:\Program Files\1stImpression-2.4.1'. Here you will find three text files with 'msg' as the prefix—they are the collection of quotes. If you want to change the text, open the files and add your text to the files, but remember to stick to the format in which text



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digit

is entered. The format is one text line followed by two hyphens and then another text line, and so on.

■ Choosy images

Some images may not suit the startup screen. The same is applicable to the other screens as well. So if you want the software to use a particular set of images for the startup screen and different sets for standby and turnoff screens, configure 1st Impression to do so.

Select the group of images from the gallery by clicking on them while keeping the [Ctrl] key pressed. Now press [P] or click on 'Choose position' under the Image menu. This will open a small window with three options: 'Startup', 'Standby' and 'Turnoff'.

Select one or a combination of options depending on which screens you want to use the selected images for.

■ Restore defaults

If you want to revert to your old Windows logo screens, you can restore them by choosing 'Restore Original logos' from the Tools menu. If that doesn't help, go to C:\Windows\Logos.bak backup folder and double-click the 'restore.bat' file. This will copy the old files to their default locations. If you are a DOS expert, you can edit the batch file and see the contents.

WinLogoChanger

WinLogoChanger has some options which 1st Impression lacks. WinLogoChanger

does not require any installation as such; just unzip the files to a folder and click on 'winlogo.exe' to start the program

■ Automating startup/shutdown screens

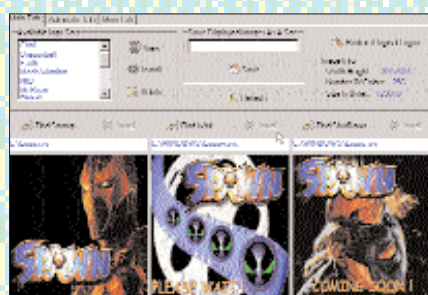
WinLogoChanger gives you a wide option for setting the automation method for changing the startup/shutdown screens. You can choose to change the screens after 'n' number of boots or 'n' number of days (where 'n' can be any number between the permissible limits of the software). You can also change the screens on specified dates. These options are available under the 'Automation' tab of WinLogoChanger.

■ Save your logo sets

You can create your own sets of logos and use them. (*Learn more about this in the 'Theme managers and creators' section*). The main window of WinLogoChanger displays the current logos on each of the three startup/shutdown screens.

To save the current set of logos, enter an appropriate name in the 'Save Displayed Image as a Set' text area and click on the 'Save' button just below that text area.

The logos will be grouped and saved in a subfolder within the same folder in which 'winlogo.exe' is located. Once it's saved, the group name is listed on the 'Available logo sets' in the main window of WinLogoChanger. You can choose different combinations of



logos and save them under different names. You can also select and install a set from the available logo sets.

Save the image for your logo

JAZZY SCREENSAVERS

Screensavers, initially meant to prevent monitor burnouts, are the PC user's ultimate statement of style



Power Screen Saver Builder

You can download screensavers from a number of sites. But if you want to add a truly personal touch to your desktop, create your own screensavers. Power Screen Saver Builder allows you to do just that. It's simple to install and use

■ Creating a screensaver

Launch the software. The

main window of the application will show you five tabs: Normal, Media, Music, Setting, and Output.

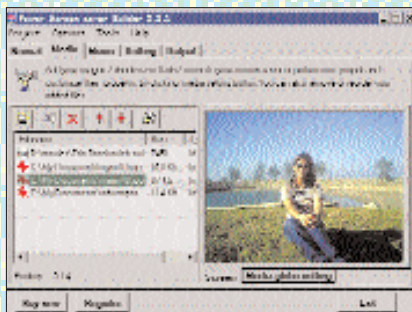
Click on the 'Normal' tab to name the project (eventually, the screensaver will be created under this name) and add a description for your project.

Click on the 'Media' tab in the main window to add images, Flash files or even MPEG/AVI movies. These



A leaner, faster, safer PC

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Select the elements for making your screensaver

elements will form a part of the screensaver you are creating. Click on the 'Add images' icon, which allows you to choose the media files you want to add to your screensaver. You can also change the position of a file. Choose the file from the list and click on the up/down arrow until the desired position is reached.

Now to add some spice, let's sprinkle the screensaver with music. You can add music files from various formats, ranging from WAV to MP3. The process is the same as for adding images. You can also set the sequence of songs to be played when the screensaver is running.

The software has an option for settings which lets you change the speed intervals, enable/disable music, and do any other configuration changes to the screensaver.

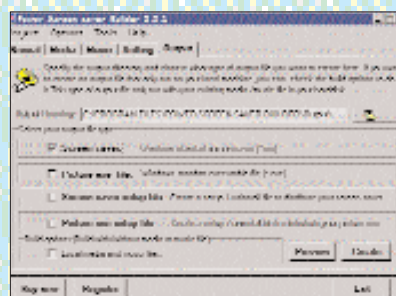
To enable this option, click on the 'Settings' tab in the main window and then click on 'Test setting'. A small window will pop up which will let you add settings information for your screensaver. Make the necessary

changes and click 'OK' to continue.

Click the 'Output' tab, which provides a variety of options to create screensaver files. You can create .scr files, windows standard executable files, screensaver setup files or even installable files for

windows executables. This might seem quite confusing.

Ignore the executable file creation options and select either the option to create .scr files or screensaver setup



Packaging your screensaver

files. Click on the 'Preview' button to test your screensaver before you finalise it. Specify the directory where you want the screensaver to be saved and click on the 'Create' button to create your own screensaver. Once you've done so, the software pops up a success note.

Click 'OK' and it will open the destination folder where the screensaver was saved. You are ready with your first screensaver now.

Set transition effects

You can set transitions from one image or movie to another by clicking the 'Properties' option under the 'Media' tab. In the window that pops up, select the 'Transition' tab.

You can choose from a multitude of options listed under this tab. Remember to set an optimal



Trim File Size

If you are using heavy music and movie files for your screensaver and want to use it only on your computer, select the 'Local media and music files' checkbox under the 'Output' tab.

This ensures that these files are not packaged within the screensaver; instead the files are saved in a separate location on the hard disk and only the references to the files are saved within the screensaver. This also ensures that the overall file size remains small.

transition rate—don't fill in an unrealistic rate. Faster transition rates may not allow you to view the images properly, which will ruin the entire fun of having a great screensaver.

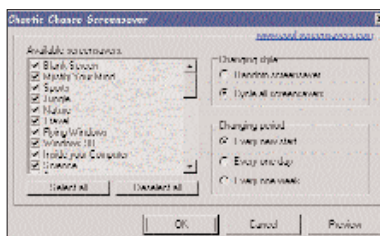
Chaotic Chance

This is a screensaver managing utility. Once installed, the software adds itself to your screensaver list. You can invoke the software either through the **Start > Programs** menu or through the **Display Properties > Screensaver > Settings** option. You will see a small window pop up. All the screensavers are listed on the left and you can preview each one of them. Click on the

'Deselect all' button and tick one of the checkboxes to select a screensaver for preview. Next, click on the 'Preview' button. This will start

the screensaver and you can see how it looks and feels.

This software also lets you randomise screensavers from the selected lot in the list. To choose a changing style, click on either 'Random' or 'Sequential'. Select one of the options against 'Change period', listed just below the 'Styles' option. Now your screensavers will be shuffled through at preset intervals.



Manage your screensavers



Spike up your Internet experience

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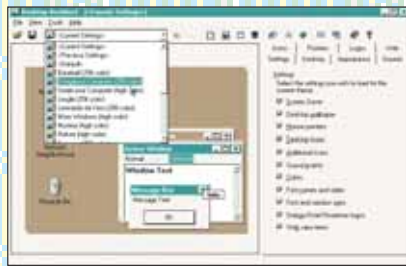
THEME CREATORS AND MANAGERS

Convert your desktop into an aquarium, a space frontier, a forest, or even make it look like da Vinci's desktop!



Desktop Architect
Desktop Architect is a versatile tool which helps you install, customise and create Windows themes with ease

Play with themes
If you've installed hundreds of themes, managing them can be a great nuisance. Desktop Architect provides a great interface through which you can manage



Desktop Architect lists all installed themes

themes better—the main window lists all themes installed on your system. Click on the 'Apply' icon to apply the selected theme to the Windows environment. You'll find a group of four icons next to the 'Apply' button, while the main window displays a preview of the currently selected theme. Clicking on these icons will let you hide/reveal wallpa-

pers, icons, and windows and see the full/empty status of the recycle bin. This helps you view the individual components of the theme and decide whether to apply

the same to your Windows environment or not.

Make your own theme
Desktop Architect as such does not provide you with options to create a new theme. But once you have the wallpapers, startup/shutdown screens and screen-savers of your choice, you can pack them together as a theme.

Select any theme from the drop-down list in the main window. The preview window on the right of the main window shows you the basic visual components of the theme, such as icons, mouse pointers, logos, desktop, appearance, and sounds.

Click on the 'Desktop' tab and browse to select a screen-saver and wallpaper that you've created.

The 'Appearance' tab lists all the colour schemes installed on your PC. You can save/delete any of those listed.

The 'Item' drop down list shows all the components for which parameters such as font, colour, size, etc are required. You can select the item of your choice and set its parameters.

Clicking on the 'Sounds' tab displays the current sound theme. If you've made your own WAV files, use them in the theme package. You can also use the sound recorder to record some snazzy captions in your voice. (Make sure the WAV files are small, else they would be intrusive to the user.)

The 'Logos' tab displays the default startup/shutdown



Pack your Theme

Choose a folder where you can save your theme file and related files. This helps you while you're packaging your theme as a distribution file, for if you don't save the files together, you'll lose most of the data while packaging your theme.

screens. Use the logos or images you created for these screens here. Browse to select the appropriate logos for the appropriate screens.

From your collection of downloaded and accumulated icons and pointers, select the best ones and pack them in your theme.

The final step is the simplest—click the Floppy icon on the toolbar or choose 'Save' from the File menu. You will be prompted for a name and a path for the theme you've created.

Enter the filename and the path for saving your theme. It will be saved as a .theme file.

Package your own theme

The .theme file you created under 'Make your own theme' has references to all the objects such as wallpapers, screensavers, etc within it. If you wish to create a whole theme pack that includes all your theme files for distribution, use the package tool available with Desktop Architect.

Click on the globe icon in



Linux blues? Cure them all!

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the main window of Desktop Architect. This opens an interactive window that prompts you to choose the theme to be packaged. Choose the '.theme' file that you just created. Click on the 'Next' button to proceed and choose the type of file that you would like to create. Choose the 'Zip file/self installing package' option from the list. Click 'Next' to proceed. Finally click 'Finish'. Your theme is packaged and ready for distribution. Mail or upload it on your site so that your friends can access it too.

Randomising themes

It's more fun if the themes automatically change at a frequency of your choice. Desktop Architect allows you set a scheduled task enabling you to randomise wallpapers and themes.

Select 'Options' from the 'Tools' menu and click on the 'Scheduler' tab. In the window that comes up, click on the 'Add' button. Next, click on 'Item' and enter a name for your scheduled task. In the same window, select the frequency of the scheduled task in the 'Schedule Item'

dialog box.

Now click on the 'Advanced' button and in the 'Start date' dialog box, set the start date for the event. Select the 'Repeat item' checkbox and set the frequency of the event.

The 'Files' tab allows you to add themes and wallpapers. From the 'Type' drop down list, choose 'Themes'. You can add single files or an entire folder by clicking on the 'Add' button. In the 'Order' dialog box, set the cycling mode as Sequential or Random. Click 'OK' and close

all the popup windows until you see the main window.

Your scheduled event will now be triggered at the pre-set time and your theme will automatically change.

To test this, right-click on the Desktop Architect icon on the system tray, choose the 'Schedule' option, and click on 'Apply random theme now'.

This triggers the event and you will see that the theme changes automatically. In case it doesn't, back-track and edit your task to see what went wrong.

SHELL REPLACEMENTS

A shell is like an advanced skin/theme replacement—a theme allows you to vary only certain features, a shell allows you whole lot more flexibility

DesktopX

This shell replacement program extends the capabilities of Windows by adding extra objects on the desktop, which get animated if you do a mouse over to reveal the purpose of that object

Adding new objects

Right-click on the DesktopX icon in the system tray or click on the DesktopX icon on the desktop to launch the configuration window.

In the 'Objects' section of the configuration window, click on 'Import'. This opens a window that lists all available objects that can be added to your desktop.

Select an object and click on the 'Load' button to add it to your desktop.

Hiding taskbar and icons

Click on the DesktopX icon on the desktop to launch the configuration window. Choose 'Theme settings' from the options listed to the left.

In the 'Desktop' tab, tick the 'Hide explorer taskbar' and 'Hide desktop icons' checkboxes. Click 'Close' to apply changes. If you choose to reveal the desktop icons (which are hidden by default in DesktopX environment) it will result in a cluttered desktop. Leave the settings at default.



ObjectBar

This shell replacement software lets you change the look and feel of your Windows environment to resemble popular OS interfaces such as Gnome, Mac OS, QNX, Windows XP, and so on

Changing the style

Launch ObjectBar by right-clicking the ObjectBar icon

in the system tray. From the menu choose Load > Theme browser. Select the theme of your choice and click 'OK'. Voila! You will have given a new look to your interface! You can also download new themes from www.wincustomize.com and load them through the theme browser.

WindowBlinds

WindowBlinds adds an



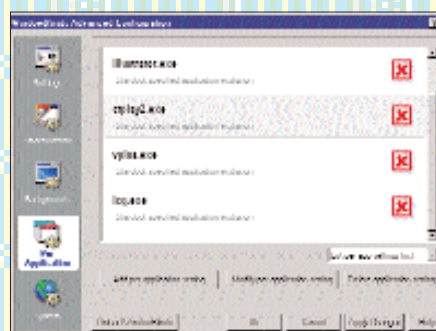
Unleash your creativity

Free Multimedia CD with the June issue of **digit**

extra menu by the name 'Skins' to the display properties window. You can invoke WindowBlinds from here. This is an easy-to-use software and boasts a special feature, which prevents shell replacement crashes

Stopping crashes

Not all applications will



Software exception list

accept shell replacements—those that cannot accept shell replacements will crash WindowBlinds. To prevent such crashes, right-click on the desktop and click on 'Properties'.

In the 'Display Properties' window that comes up, click on the 'Skins' tab and then click on the WindowBlinds button. This opens the WindowBlinds advanced config-

uration window. Click on 'Per application' from the list on the left and then click on the 'Add per application settings' button.

Here, select the application on which you don't want WindowBlinds skins to be applied. After you select an application, you will be shown a configuration window in which you can set WindowBlinds not to skin that particular application.

Changing a skin

Right-click on the desktop and choose 'Properties' from the menu. In the 'Display Properties' window, click on the 'Skins' tab and select a skin of your choice from the list.

The preview window shows thumbnails of the skins to help you make a choice. Click 'OK' to apply the skin. This will automatically change all the menus, submenus and other visual interface components to the skin design specifications.

Warning: Configuring themes

It is best to go with default options and not configure the themes.

The interface is complex and has too many options to set. If you go wrong at even a single point, you could end up

messing up the entire theme you are configuring. In case you feel adventurous, go ahead with the tweaking. Just remember to reinstall the software in case anything goes wrong.

VIRTUAL DESKTOPS

Virtual desktops extend your monitor's work area and group similar applications in separate virtual desktops



Cool Desk

This software allows you to create up to nine virtual desktop screens, each with a different wallpaper and sets of icons

How many virtual desktops?

Right-click the Cool Desk icon in the system tray to launch the software. Click on the 'Settings' option to open the configuration window. Here you can set the number of virtual desktops you require.

Using custom screens

To differentiate between screens, choose different wallpapers (or background colours) for each. Similarly, you can have customised icons for each virtual desktop—this allows for better

organisation. You can add customised icons by clicking on the 'More' tab in the main window.

Toggling between screens

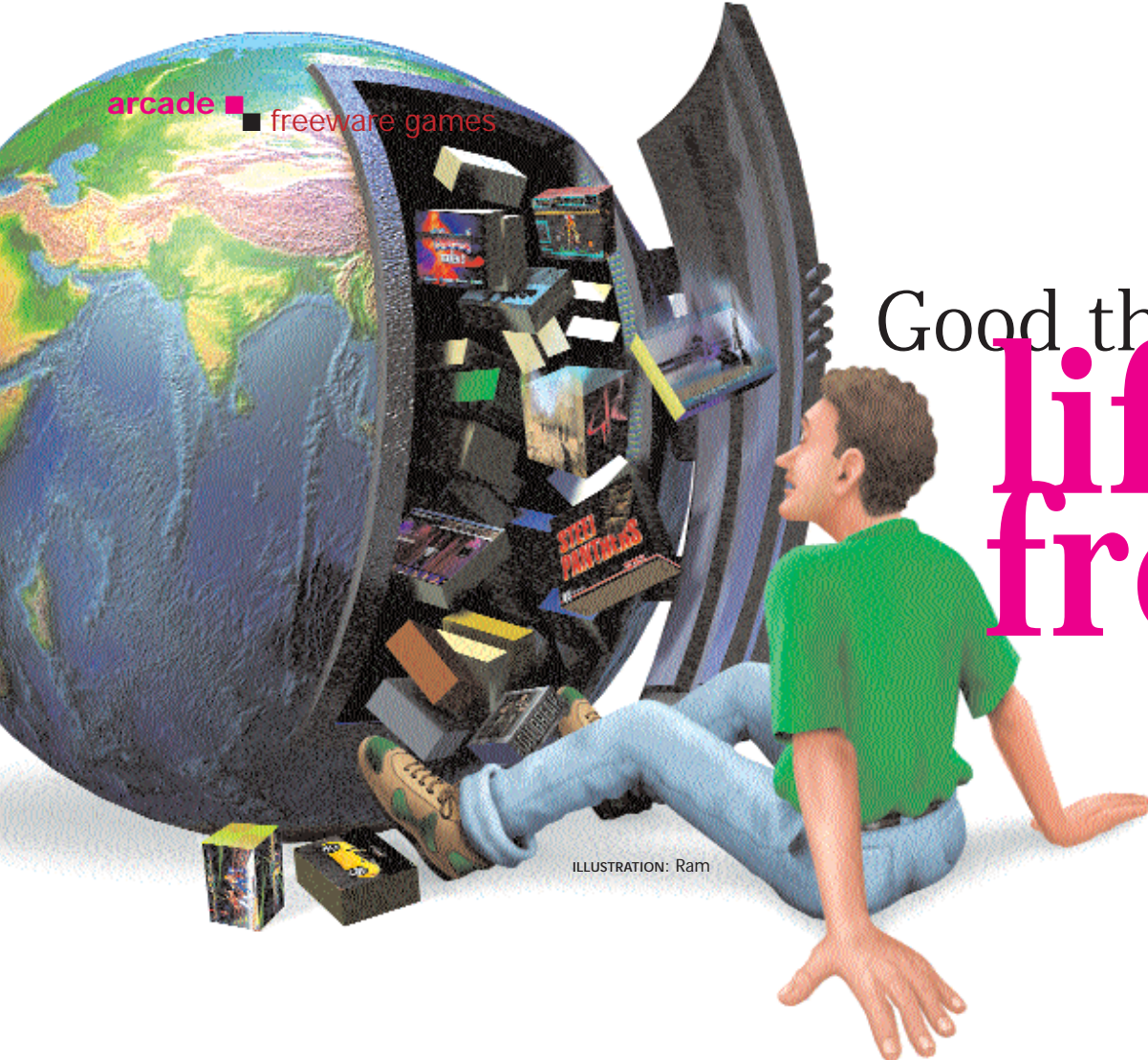
Press [Ctrl] + [Num +] or [Ctrl] + [Num -] to cycle through the screens sequentially. To shift randomly between screens, press [Ctrl] + [Alt] + screen number.

Moving active windows to different virtual screens

To move an active window to a screen, click on that window and drag it to the appropriate virtual screen listed in the 'Desktops Manager'. Or press [Ctrl] + [Shift] + screen number. This will shift the window that's open to the appropriate 'screen number'.

ANNIVERSARY 1 ISSUE
5 FREE CDS WITH digit





Good things in life are free!

There's a treasure trove of free games lost in the vast expanse of the Net. Let's embark on an exploration to find these gems

ILLUSTRATION: Ram

Every gamer's wishlist would be made up of all the cool new games in the market, but buying them all simply isn't a feasible option. With prices ranging from Rs 500 to Rs 1,000 a game, only the insanely rich can feed such an expensive hobby.

If you can identify with this dilemma, then this article is just what you need. We'll tell you about the best in freeware games, where to get them, and why we think they're worth your time. While it might seem that the majority of the available freeware games are not worth your time, there are diamonds to be found if you look hard enough. We've filtered through the bandwidth wasters, and found the most addictive little puzzles, classics, and game modifications that are the perfect way to fill that void in your life before your next pay check/allowance rolls in.

Classic game remakes

It's amazing how far computer games have progressed in providing believable and immersive alternate worlds. But the classic games of the 1980s and early

1990s had something special about them. That was when gameplay reigned supreme, as there was no eye-popping graphics and digitised sounds to numb the senses. They just don't make them like they used to—the simpler, but more addictive games of yesteryear had their own personal edge in comparison to today's games that boast nothing but eye-candy.

All modern games have evolved

from classic games. An example of this is the timeless *Mario Brothers*, which evolved the arcade game genre ruled by classics such as *PacMan* and *Donkey Kong*. Games such as *Crash Bandicoot*, *Sonic the Hedgehog* and *Tomb Raider* have taken this genre a step further. And no one can deny that the legendary *Wolfenstein 3D* bought about a completely new genre in modern gaming, the 3D shooter. The great news is that

all your favourite classics, even those from the early 1980s, are available on the Internet, in both the original format as well as in the form of PC remakes.

For those who would like to play old school games of the ZX Spectrum, www.retro-spec.co.uk provides PC remakes of classic Spectrum games. These remakes improvise on the original and offer graphics and sound that the Spectrum did not offer back then. Some of these games are among the best ever written—*Jetpac*, *Trailblazer*, →



Classic games such as *Cybernoid* on the Spectrum have been remade for the PC

Chuckie Egg, *Jet Set Willy*, *BombJack* and more.

The best archive of remakes for all formats can be found at <http://retro-remakes.emuunlim.com>. The greatest classics, from arcade games to the Commodore Amiga, have been remade and released here. There are over a hundred free and shareware games to be downloaded, including *Space Invaders*, *Asteroids*, *Boulderdash*, *Centipede*, *PacMan* (in all its incarnations), *Donkey Kong*, *Arkanoid*, *Super Mario Brothers*, *OutRun*, *Attack of the Mutant Camels* and lots more. These remade games are being presented as 'classic games for the next generation'. There are, of course, other remake sites. 'Remakers' are a very vibrant community—they have large Web rings and are well-connected. There's an air of enthusiasm that you can sense in their discussion forums and project announcements.

Game companies themselves release some of their games into the public domain. After all, there's no point hoarding a game that has no commercial value. This helps in increasing the fan base of the franchise, besides keeping the flame of the classics alive. Also, if you enjoy playing *Ultima*, you might just be willing to buy the sequel. Commercial hits of yesteryear such as *Caesar*, *Descent* and *Steel Panthers* are now available as freeware.

Many software companies abandon their old games by not selling or supporting them. Abandonware is any game that is at least three years old and is not being actively sold or supported by the company that produced it or by any other company. Classic gaming enthusiasts distribute such abandonware software themselves. Abandonware Web rings provide software and support to people who have outdated computers.

Emulation

Another source of free games is through emulation. In simple terms, emulation is the act of mimicking the functions of another device. Emulators can mimic any computer or game console on your PC. After installing a console emulation program on your computer, you can load a game ROM—the same game program that came packaged in a cartridge that you might have bought so many years ago—and play it right now on your computer. The advantage here is that you can play pretty much every game ever



Samurai Showdown on the MAME

released for your emulated console (you would still need to get your hand on the game ROMs). The disadvantages range from tangible concerns such as questions of legality and copyright infringement to intangibles such as facing collector scorn—emulated games are not any better than forged artwork. They're not considered the real McCoy even though the programs themselves are perfect digital copies of the original.

Emulators have been around for 20 years or more in one form or another, but it's generally agreed that the first consumer-oriented example was an Apple II emulator for the Commodore Amiga. The early 1990s saw the release of the first commercial game emulators. Since then, the emulation scene has exploded along with the nostalgia gaming movement. A large number of shareware and freeware emulation programs

now exist, from small homebrewed single-console programs to larger, more ambitious multi-console projects such as MESS. Huge community-based projects such as MAME have helped restore thousands of popular arcade games dating from the 1970s to the 1990s. The quality of these emulators range from the almost unworkable, feature crippled, crash-prone beasts that run extremely slowly, to the 'gold-standard' MAME, which is rock solid and runs every game it supports as well as the original arcade machines themselves.

New Classics is the term used to describe new games written for old systems. People are still writing games for the ColecoVision, the Atari 2600, Game Boy and other game systems. Programmers write the game and release it as a ROM image. They don't need to make a cartridge, since freely available emulators can run their game.

Mods

Sooner or later you're bound to get bored with your single player version of *Half-Life*. Rather than simply tossing your game onto a shelf somewhere and forgetting about it, modifications or mods allow you to experience a whole new gaming experience with a few free downloads. One could consider anything that modifies the original game (maps, for example), as a mod. A mod is anything in which some code changes are

The Brief History of Bleem!

Bleem!, the company behind the PC and Dreamcast-based PlayStation emulator of the same name, was shut down in November 2001. Bleem! launched its PlayStation emulator just over two-and-a-half years ago, only to be instantly sued by Sony for a mix of copyright infringement, intellectual property violation and brand degradation.

Bleem! wasn't meant as a substitute for the PlayStation, but it did have its advantages over Sony's console. First, it had the ability to use 3D hardware acceleration to

increase the graphics resolution to PC-quality and second, it let you play games on your PC or laptop.



May 2000 saw the announcement of Bleem!cast, the Dreamcast version of Bleem! Sony sued the company again for patent violations. With the PlayStation and Xbox code protected against emulation efforts, both legally and through hardware and software-based techniques, Bleem!'s scope for future expansion looks quite bleak.

Going the Mod Way

Quake Rally

Turn *Quake III* into a full-fledged racing sim. This mod supports up to 16 opponents in multiplayer, and while winning the race is one of the goals of the game, you also get points for blowing up your opponents with the various *Quake*



weapons of destruction. The handling is good, and behaves like a real rally racer, with power

slides and skids—all very easy to pull off. While the jumps do seem exaggerated (cars fly through air for what seem like miles), the steering works amazingly well.

The single-player option has 'timer trials' where you race around a track, trying to 'beat the clock', while collecting the various flags to boost your time. Despite the bugs and a weak single player mode, it scores big points for just being *Quake Rally*, a racing simulation for *Quake III*. One can't even begin to imagine the technical hurdles the modders would have encountered while attempting to code something like this. But it just goes to prove that with the *Quake* engine, anything is possible.

Jailbreak

Jailbreak originally started out as a *Quake II* mod by Team Reaction. The concept has been ported to *Quake III* and *Half-Life* as well. A CTF variant, Jailbreak continues the eternal battle between the reds and the blues. Instead of trying to capture a flag or a goal, your team must capture the entire enemy team. When you have fragged an enemy player, he is captured and placed in the jail in your team's base. When all the enemy players have been captured, they are executed and your team scores the capture point.



Jailbreak is a fast moving game where your objectives are constantly changing. Do you mount an attack and try and get the enemy in jail? Do you hold back and defend your release button? Do you stand guard near the jail's escape route to pick off any escapee? These strategies help shift the momentum back and forth in the game. The mounting tension and decision-making that Jailbreak brings makes for some adrenaline-pumping moments.



Online Games

These games aren't meant to suck up days and weeks of your life, but rather provide 30 minutes of fun before bed-time (or during your lunch break). The Internet offers an incredible variety of gaming experiences that would appeal to everyone, from sweet old grandmas to military strategists. When you're ready to set sail on your online gaming adventure, the sites listed here are worth a visit.

Microsoft Gaming Zone

<http://zone.msn.com>

A multifaceted resource, Microsoft's Gaming Zone includes dozens of attractive casual games, plus an extensive network of head-to-head, opponent-matching services for serious players.

Shockwave

www.shockwave.com

The Macromedia Shockwave browser plug-in lets you play graphically rich online games with minimal download times. There's a great collection of faithfully recreated arcade classics (*Joust*, *Defender*, *Sinistar*, and more), sports and adventure titles, along with a wide variety of puzzle games.

The Station

www.station.sony.com

There are plenty of free choices here—from dating games to multiplayer incarnations of *Wheel of Fortune* that play just like the real thing. Sony's Station has the most amusing line up of games that you can play against people from over the world in real time.

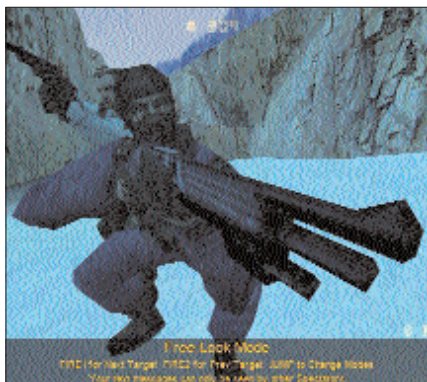
Yahoo! Games

<http://games.yahoo.com>

You'll always find plenty of players here ready for a quick board, card or tile game. And as the games are Java-based, no lengthy downloads are required.

involved, be it changes to physics, gameplay or game rules. User modifications are vastly prevalent in the online gaming community.

Mods are no longer simple hacks; they can rival commercial games in refinement and gameplay. Today, they are far



Counter-Strike: The most successful mod ever

better than commercial add-ons in gameplay and complexity. Total Conversions are modifications that are so significant that they change the entire appearance

and purpose of the game. Mod makers change everything about the game, from adding new player models, new textures and maps to new game modes. Game concepts such as 'Team Fortress' and 'Capture the Flag' have been ported to almost every popular 3D shooter.

First-person shooters have indirectly benefited from the mod community. With revamped and refined modes of gameplay, *Half-Life* got an extra lease of life. Even after four years, it continues to sell because of gamers who want to play *Counter-Strike* (a popular team-based modification). Game developers support the mod community because they realise that the latter can come up with great ideas and can make the best use of a game's potential. User-made expansions are being encouraged by many game development outfits through the inclusion of track editors, level editors and construction kits with the game. Editing tools do their part to encourage users to fiddle around with the game, while showering gamers with new and unique mods.

Mods are found in other game genres as well. *Command and Conquer* features several mods that alter its gameplay and add new units and buildings. *Age of Empires* has a mod pack studio, which serves as a full-featured editor that lets you create mod packs of your own.

So go ahead and explore the Net. There are more than enough goodies to provide you a lifetime of free gaming.

SRIRAM SHARMA

MEDAL OF HONOR ALLIED ASSAULT™

Step into World War II and test your grit within one of the best FPS games ever

Medal of Honor: Allied Assault (MoH) is a first person shooter that takes you back in time to the European battlefields of World War II. You play Lieutenant Mike Powell, a highly skilled member of The Office of Strategic Services. The game is based on the realistic settings of World War II, and sticks to its classic roots of the PlayStation version.

SINGLE PLAYER TIPS

Use quick save!

Each of the six main missions is divided into a number of sub-objectives and the game automatically saves once you accomplish these. There are places where Quick Save becomes invaluable, for

instance, the third mission, Operation Overlord. Trying to get off the landing craft and up the beach alive is something that takes a bit of time, as you gauge the right path to take, running between tank traps, up to the shingle bank and to cover.

In mission five there's a superbly atmospheric, sniper-ridden town that will also demand extensive Quick Save usage.

Stealth is health

A stealthy approach is best. Remember, you have a huge advantage if you see the enemy. Listen for audio clues to pinpoint where the enemy is lurking. If you hear shuffling feet nearby, chances are an enemy is not too far away from you. If you have a silencer in your inventory, use it while making your way to the level objective. That way, you won't alert soldiers to your position. Don't stand in one place 'duking' it out, and never go out in the open. Keep behind structures and line up your kills from a safe distance when possible.

MULTIPLAYER TIPS

MoH features all the standard modes of play, Free for All, Deathmatch, Objective based Matches, and Team Deathmatch. There are around 10-12 multiplayer maps, including the famous D-Day landing map. Here are some basic tips to get you started.

- Never stop moving unless you have

Hidden Level

Contained inside Medal of Honor: Allied Assault is a secret map called 'm410.bsp'. It's a unique map, with an open terrain and a whole bunch of dogs. Here's how you can access this map—When you enter the game's console, key in 'maplist' and select the map 'm410.bsp'. You'll play a hidden mission not found elsewhere in the game.

One little warning though: do not enter the water! It's impossible to come out of it and you'll only end up getting stuck.



Cheats

Edit the shortcut to the game so that it reads as follows: "Location of game\mohaa.exe" +set ui_console 1 +set cheats 1 +set thereisnomonkey 1

When in the game, press the tilde key [~] to display the console window. Type one of the following cheats:

Wuss: Gives player all weapons

Dog: God mode

Fullheald: Heal player

Notarget: Removes target

Noclip: No clipping

Listinventory: List of the player's inventory

tele x y z: Teleport to location

coord: Prints out current location and angles

health: Set current health


kill: Kills the player

cover. Stop to shoot at enemy snipers, and you're most likely to get rushed from another side by the infantry, packing a submachine gun or bolt-action rifle.

- Grab health whenever you can—which means the 50-point First Aid kit left behind every time a player is killed.

- Keep an eye on the ammunition counter. Make sure you have enough health and are fully loaded before rushing into battle.

- Radio commands work better than you might think. Screaming "Grenade" is sure to have everyone on your team looking for cover.

- Unless you're the last person left on your team, don't try and be the hero. You won't last long if you try to take on a platoon of soldiers by yourself. Teamwork is important in Medal of Honor, so be a part of one. 

SRIRAM SHARMA

Battle cries

Medieval castle building or John Woo style action, these games have it all!

WOW! That's what I call AXTION

Now that's what I call *paisa vasool!*

Often you find budget packs with 10-1000 games, crappy console conversions, old classics, or forgotten 'has-beens' that need to be sent to the gas chamber. Fortunately, this isn't one of those packs. Milestone, in association with AXN, brings you *WOW! That's what I call AXTION* a four game pack with *Max Payne*, *Rogue Spear*, *Deus Ex* and *Tomb Raider: The Last Revelation*. A four-in-one game pack for Rs 999.

Having seen a lot of budget packs, this one does stand out for the quality of games. *Max Payne* was just released last year, and it already has a couple of excellent mods that you can use to extend the life of the game. Not much needs to be said about *Max Payne*; it's, quite honestly, one of the best releases from last year.

Tomb Raider: The Last Revelation is a supposed last gasp from the over played Lara Croft series. The Lara Croft franchise is getting old, but this game is perfect for newcomers to the action genre.

Deus Ex is an excellent first person RPG hybrid that will keep you compelled beyond your wits. If you want a break from



The AXTION pack features this critically acclaimed cypherpunk First Person Shooter/RPG hybrid

all out deathmatching, then try the strategy filled *Rogue Spear*, and you won't be disappointed. The game is a much improved version of the original *Rainbow 6* and brings in more and better counter terrorism aspects. It's a must for every arm-chair counter-terrorism operative.

This is a pack meant for action gamers inclined towards playing single player

games. All the games on this pack have a heavy single player element, with the exception of *Rogue Spear* and *Deus Ex*, which have token multiplayer modes.

The packaging is as flimsy as ever, with paper covers and game manuals on the CD. It would have been refreshing to see the collection in a jewel case. It looks like they dumped the surplus inventory into one pack and redistributed it under a different name.

However, these are a good line up of games, premium titles that will stay in the consciousness of gamers for years to come. So here's a gamepack that isn't too outdated, has a good quality of titles, comes at a bargain, and looks like value for money in every way you look at it.

Anyone with a graphics card should definitely consider this.

Genre: Compilation

Developer: Various

Distributor: Milestone Interactive

Phone: 91-022-8381614

Web site: www.milestoneinteractive.com

Price: Rs 999

Rating: ★★★★★

Stronghold He who rules by the sword...

Unlike most Real Time Strategy games, *Stronghold* has a mind and story of its own. This castle simulator from Firefly Studios breaks away from the much beaten path of strategy games by allowing you to play economic campaigns as well.

At first glance *Stronghold* seems like an *Age of Empires* (AOE) look-alike, thanks to its medieval scenarios and castle building gameplay, but that's where the similarity ends.

You play as a feudal lord and can either choose to get into the thick of the action or play it safe and settle for an economic campaign, where you build your castle and manage your town while attempting to complete your objectives.

The game has some realistic landscape animations, such as wind blown trees, and cool sound effects, be it a hunter skinning his kill or a pack of wolves on the prowl. The graphics are a

notch over traditional top down perspective games, with the ability to change your angle of view while exploring the landscape. You can also level any huge mountains or thick forests to look for enemy soldiers lurking behind them!

As a war strategy game, most of *Stronghold's* gameplay arises from managing your town. The population of your town depends on your popularity, which in turn is affected by your policy on taxes

and the way you rule. Depending on the level of taxes that you levy, which range from 'small bribes' to 'no taxes' to 'mean taxes', your population will increase or decrease. As your popularity increases so will the number of people coming to work and living in your castle. You can check your status reports, such as food stocks, by clicking on the scribe whose facial expressions indicate your popularity level! The scribe also gives you instructions and calls out warnings while playing the military campaigns.

You start off by choosing an appropriate location for your keep, around which you must build your town and castle. To begin with you have a default amount of resources but you must soon go about building up on your stockpile of food and wood. However, unlike AOE these tasks are more detailed in *Stronghold*. For example, a woodcutter



The graphics in *Stronghold* feature variable points of view

chops wood and carries it to his hut to saw them into planks, which he then carries to the stockpile. Similarly, your fletcher won't start making weapons until he carries wood over from your stockpile to his workshop! Just a few examples of the attempts to add realism to what would otherwise be another

medieval castle building game. Your main enemies are some pretty shady characters; Duke de Puce (The Rat), Duke Beauregard (The Snake), Duke Truffle (The Pig), and Duke Volpe (The Wolf), who rule the neighbouring lands. In the multiplayer mode *Stronghold* supports up to eight players on a LAN or Internet connection.

Aside from its unbearable manual, which is predominantly in Hindi interspersed with game terms in English, this game is definitely a must play for strategy fans. In summary, a treat for the real time strategy lover who can't afford *Age of Empires*.

Genre: Strategy

Developer: Firefly Studios Limited

Distributor: e-xpress Interactive Software

Phone: 91-022-88700175

Web site: www.fireflyworlds.com

Price: Rs 699

Rating: ★★★★★

Command and Conquer: Renegade Renaissance

Command and Conquer (C&C): Renegade takes the Real Time Strategy (RTS) series down the First Person Shooter (FPS) path, with entertaining results.

The C&C franchise started in 1995, and since then has produced some of the most successful real-time strategy games. But unlike previous incarnations, *C&C Renegade* treads new ground—this is the first time Westwood has come out with a first-person shooter.

This game continues the tradition of the C&C series, and delves again into the struggle between GDI and the Brotherhood of Nod. The game puts you in the role of 'Havoc', based on the Commando unit of the original game. Havoc has now been reincarnated to embody your macho, beefy, take-no-prisoners action hero.

The battle, essentially, is for control of the planet and the dwindling power source known as Tiberium. Nod leader Kane has been experimenting with Tiberium and created mutant super-soldiers. Havoc, with an ensemble of other characters, has to stop him. You will get the opportunity to drive several vehicles, collect a wide variety of weapons, and shoot an endless stream of bad guys. The FPS aspect of this game features power-

ups and weapons that you collect as you go on.

Once you are into a mission, the game plays well. The game uses scripted events, radio transmissions, and staged battles to simulate the feel of being on a 'real' C&C battlefield. Graphically, *Renegade* looks somewhat dated, especially when you consider that its system specifications asks for a better system than what *Max Payne* and *Wolfenstein* do! Still, it's a good showing for a non-Quake III derived engine.

Multiplayer consists of Deathmatch and Capture the Flag modes, but where it finally leaves its mark is the Command and Conquer mode. This mode pits the forces of NOD against the GDI army, whereby the match is won once all of either side's buildings are destroyed or a beacon of mass destruction is placed on a certain pedestal. The game feels like *Tribes 2*, and is an absolute blast to play, easily rivalling the current crop of online FPS games.

Renegade is fast and furious fun; mowing down enemies and blasting things is mindless fun. The only drawback of the game is the AI; the enemies run straight into a gun sometimes and stand immobile at other times.



Havoc guns down on NOD troops

Overall, the title is a little pricey, but coming from Westwood and EA, good production values are assured. While the single player version of the game has its drawbacks, the strong multiplayer aspect of the game carries it through. Fans of the *Command and Conquer* series should give this one a look.

Genre: FPS/Action

Developer: Westwood

Distributor: Origin Marketing

Phone: 91-022-8801335

Web site: www.cncrenegade.com

Price: Rs 1,290

Rating: ★★★★★

Chalo Dilli!

Our Circulation team undertakes a tour of the North to locate new distributors

Some of our readers complain that they do not get Digit from the news-stands in their town. Taking up the challenge of ensuring that readers in small to middle level cities do not have to travel far to get their copy of Digit, our Circulation and Logistics team travelled 27 cities in the North of India to hire new distributors and courier services.

January 2002: The team was flagged off from Mumbai. Suitably armed to brave near Zero degree temperatures, the five

Himachal Pradesh—a route packed with hairpin bends. There were no hotels and few vehicles along this unfrequented stretch, but they made it to Dehra Dun in 5 hours flat. This gave them time to enjoy a good night's rest.

Day 9 was quite uneventful, but while leaving Roorkee the

there. To catch up with their schedule they rested briefly before leaving for the next destination—Delhi. Heavy winter fog impeded visibility, but they wouldn't stop for anything, except food at about 2.30 am. In fact, soon



The team with the drive: (L to R) Arup, Nikhil, Sourav and Akhilesh



were on the road from 7 am till 2 at night. The team would spend two to three hours in each city, finish work, and move on to the next destination. The first week was smooth sailing, except for the fact that most *dhabas* in the North do not serve rice as part of standard meal. Our guys from the rice belt carried their own supplies of rice and dal and for Rs 50, they would convince *dhaba*-owners along the way to allow them an hour of cooking time and have piping hot self-made meals!

Their misadventures began after the team touched Simla. It was day 8 and the team finished their work by 7 pm. Dehra Dun was the next destination. The road map showed that the only way to Dehra Dun was through Panchkula (Chandigarh). But eager to reach the next destination as soon as possible, the team relied on their own sense of direction and discovered a new 'shortcut' to Dehra Dun via Nahan and Paonta Sahib in

Sumo had diesel only enough for around 60 km. The next stop was Saharanpur, about 70 km away, and the adventurers decided to try their luck and refuel along the way. But they ran out of diesel just 17 km down the highway, and with no petrol pump in sight. Luckily, they spotted a tractor coming their way—Akhilesh, the head of the team, jumped off the Sumo, caught up with the tractor, and asked for

help. They were towed to the nearest petrol pump in the dark of the night through a lonely track in the midst of eerie silent woods. It was a silent and scary ride and upon reaching the petrol pump, they learnt that the track they had just covered was a shortcut to Saharanpur and that it was a dacoit infested area.

The team touched Saharanpur at midnight, and it was too late to do any work

other vehicles followed their lead and a convoy of vehicles followed them to Delhi, where they reached at 5.30 am.

After a full day spent wrapping up their work, the team was eager to head home to Mumbai. The aim was to leave early next morning and drive straight to Mumbai, to reach there within 24 hours, with stopovers at Agra and Gwalior for further deals with distributors. A massive traffic jam ahead of Mhow in Madhya Pradesh and the several police check posts between Sirpur and Sindhwa, ahead of Mhow added hours to their tight timing. This stretch is prone to highway robberies and the police allow vehicles to pass through only in batches of 10. Our veteran roadsters, keen to get home, overtook the truckers travel-

ling at a slow 40 kmph, joined another cavalcade of trucks at the next check post. They touched home in 27 hours. ■

TARGET ACHIEVED: 11 new distributors

AVERAGE SPEED THROUGH THE JOURNEY: 100 kmph (Arup is an ex-rally driver)

TOTAL EXPENSE: An unbelievable Rs 20,000 (including diesel cost)

What was that again?

"Network: Any thing reticulated or decussated, at equal distances, with interstices between the intersections." — Samuel Johnson, Dictionary of the English Language (1755).

Murphy's Laws of Computing

1. When computing, whatever happens, behave as though you meant it to happen.
2. When you get to the point where you really understand your computer, it's probably obsolete.
3. The first place to look for information is in the section of the manual where you least expect to find it.
4. When the going gets tough, upgrade.
5. For every action, there is an equal and opposite malfunction.
6. To err is human... to blame your computer for your mistakes is even more human, it is downright natural.
7. He who laughs last probably made a back-up.
8. If at first you do not succeed, blame your computer.
9. A complex system that does not work is invariably found to have evolved from a simpler system that worked just fine.
10. The number one cause of computer problems is computer solutions.
11. A computer program will always do what you tell it to do, but rarely what you want to do.

" When all else fails,
read the instructions."

— L. Iasellio



Your chance to bite back!

Highlight the lighter side of computing. Mail your contributions to Backbyte Digit, Plot D-222/2, TTC Industrial Area, MIDC, Shirvane, Nerul, Navi Mumbai 400 706 or e-mail us at backbyte@jasubhai.com

There are three kinds of death in this world. There's heart death, there's brain death, and there's being off the network

— Guy Almes
(Chief Engineer, Internet2)

ABIT promises Instant Performance...



...Definitely something to be taken with a pinch of salt

Emoticons you may never use!

| | |
|----------|--|
| :D* | Person laughing so hard that he/she does not notice a 5-legged spider hanging from his/her lip |
| >8-O-(&) | Person just realising that he/she has a tapeworm |
| .-) | Person who can smile despite losing an eyeball |
| :V:- | Person who cannot figure out why nobody wants to talk to him/her, little suspecting that there is an alligator on his/her head |
| -oE]:- | Fisherperson heading for market with a basket containing a three-legged octopus that is giving off smell rays |
| >:- -{9 | Person who is none too pleased to be giving birth to a squirrel |

Selected from www.randomhouse.com/features/davebarry/emoticon.html

Software Development Cycle

- Programmer produces code he believes is bug-free.
- Product is tested. 20 bugs are found.
- Programmer fixes 10 of the bugs and explains to the testing department that the other 10 aren't really bugs.
- Testing department finds that five of the fixes didn't work and discovers 15 new bugs.
- Repeat steps 3 and 4 three times.
- Due to marketing pressure and an extremely premature product announcement based on an overly optimistic programming schedule, the product is released.
- Users find 137 new bugs.
- Original programmer, having cashed his royalty cheque, is nowhere to be found.
- Newly-assembled programming team fixes almost all of the 137 bugs, but introduce 456 new ones.
- Original programmer sends underpaid testing department a postcard from Fiji. Entire testing department quits.
- Company is bought in a hostile takeover by competitor using profits from their latest release, which had 783 bugs.
- New CEO is brought in by board of directors. He hires a programmer to redo program from scratch.
- Programmer produces code he believes is bug-free...
- Life goes on...

Contributed by Sameer Goswami