# IN TEST: 13 LAPTOPS

Laptops have become as commonplace as your cellular phone, and now come with a number of configurable options and different prices. A look at the best of them

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L aptop users are one of the most discerning lot. They need everything perfect—the features, the price, the build quality, the weight and dimensions, the display, battery uptime or, for that matter, the ease of the trackball. Earlier, there were hardly any configurable options available. But today, we have a variety of laptops in different configurations with the fastest processors and just about anything you want. It is not very shocking to see an 800 MHz Pentium III processor powering a laptop. Also, just as the prices of PCs are falling, so are the prices of laptops.

Companies such as Intel, AMD, Transmeta and nVidia, to name only a few, are making laptops a hype and reality. Intel and AMD have brought out technologies such as SpeedStep to preserve battery power in laptops. Transmeta is out with a cheaper and effective laptop solution. nVidia is slowly entering the laptop graphics processing unit (GPU) market, which till date was dominated by ATi and Matrox. Even the GeForce 2 Go processor from nVidia allows you to get 3D gaming performance on laptops similar to a desktop experience that till only a year ago would have seemed unimaginable. So, the next time you are on the move, you can probably chill out for some time watching *My Best Friend's Wedding*.

Want more

If you are on the move all the time, you probably need a laptop that can do all the things that you would be able to do with a desktop PC. One that will not only enable you to create documents, spreadsheets and presentations, but also send and receive e-mail, access the Web and maybe even play music CDs or watch a DVD movie to get that much-deserved break. You need a laptop that is also sturdy enough to take the bumps and jolts in its stride while you are on the move.

If, on the other hand, you want a laptop for basic tasks and primarily for mobility so that your work doesn't get held up on the occasions that you need to travel, then you would not necessarily need the best in terms of the choice and the power of its individual sub-systems. Therefore, if the CD-ROM drive or floppy drive is not integrated into the main unit, but is supplied as an additional peripheral, the frequent traveller would not really mind, because the overall weight of the laptop would be significantly lesser and would be easier on your shoulder after a long day commuting.

Those who use their laptops for applications like making presentations would need the best possible TFT screen and audio system on the laptop. Components like the processor, for example, would not need to be very high-end as excessive processing power is not required in running these types of applications. You would also need the best possible battery and power-saving features
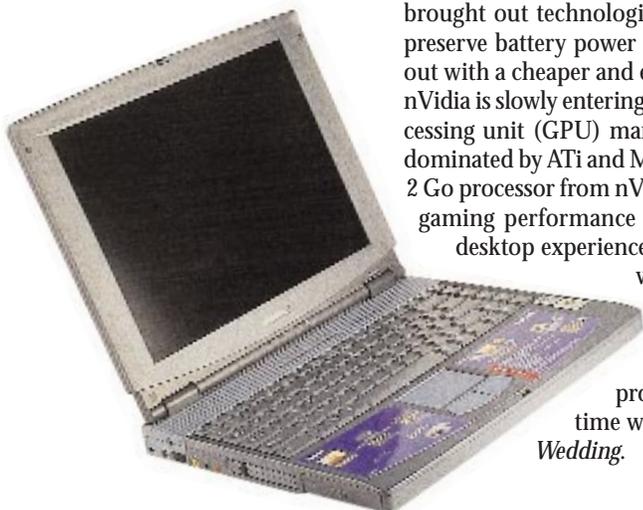
TOP
ON TOP

if you plan to use your laptop for extended periods of time while on the road.

Performance is the key

We evaluated the laptops on the basis of their performance in certain key parameters that stressed out specific sub-systems of the notebook like the raw processing, storage sub-system, video performance and the overall performance of these sub-systems working in tandem.

Need that horsepower: If you are using your notebook as an alternative to your desktop, you will need a fast processor that will be able to deliver the performance you are looking for, and has sufficient system memory to store all those heavy-duty applications to do your work.

Therefore, if you're looking for a desktop replacement-class laptop, you would need a fast processor (like a Coppermine 650 or higher), at least 64 MB of SDRAM and a graphics sub-system that features some form of 3D acceleration with integrated video RAM. You would also be looking at an 8 GB hard disk at the least.

If, on the other hand, you want a laptop for basic tasks and primarily for mobility, then you would be looking at a Celeron-based system with 64 MB of RAM and a 6 GB hard disk. Here, for example, you would not need a graphics sub-system that features 3D capabilities.

Contents

For more information on the test process and the laptops tested, check out CHIP CD-Mindware

Test Process

We subjected the laptops to a variety of tests that measured the core performance of the system in different areas such as graphics, word processing, etc. The main benchmarking tests performed were Content Creation 2000, ZD Winbench 99, Photoshop test, Video playback test, *Quake III Arena* and Battery test.

Apart from the core performance, we also looked at the features, build quality and price. To calculate the overall scores, a series of weightages were assigned to the tests.

As can be seen from the graph, the Content Creation test and Winstone 99 had the maximun wieghtages because they reflect the real-life performance.

To test how the notebooks performed when it came to the processor, the RAM and the hard disk drive, we ran the Photoshop test, which is a good indication of the overall performance of the computer system, as it stresses all three sub-systems. The Photoshop test consisted of several steps where a script was executed to perform all kinds of image-editing tasks (there were 21 tests in all) on a 10 MB test image.

We noted the time taken to apply each of these filters. A lesser score indicated that the laptop completed these tests in a lesser amount of time and thus, the combined performance of the CPU, the RAM and the hard disk was also better. The laptop that outperformed the others and did especially well in this test was the **Zenith 21A**. The other noteworthy performers in this test were the ACi Concept and the Acer TravelMate 734TL.

If it's mobile computing you're looking for, then the Toshiba Tecra notebook would be a very good choice for it did well in these tests.

Fit for display?: The quality of the display screen on the laptop is one of the main factors that need to be evaluated while purchasing a laptop as this is the most expensive part and it's something that cannot be upgraded later on. If you're going to spend hours in front of it through your working day, you would definitely like to see that it provides a comfortable viewing angle and is bright enough for you to use in your working environment.

Most of the laptops we received had a high-quality crisp display, but there were a few which were badly blurred and exhibited a highly noticeable amount of ghosting when viewing dynamic content like games and movies. Almost all the laptops that came in for testing used TFT screens, thus allowing for a wide viewing angle.

We ran the video playback test on the laptops to test the quality of the displays. We played a video CD on the laptops and checked the screen for any kind of motion blurring. A good screen shows little or no

Speed Demons

Desktop replacement-class laptop: Coppermine 650 or higher, 64 MB of SDRAM, 3D acceleration with integrated video RAM, 8 GB hard disk

Laptop for mobility: A Celeron-based system with 64 MB of RAM and a 6 GB hard disk

Seeing is Believing

Thin Film Transistor display: A TFT display, also called active matrix display, produces bright, vivid pictures that can be viewed from wide angles. It also gives a fast response time, which means that if you are viewing fast-moving images, the appearance on your laptop would be fluid and crisp.

This is important if you are going to be making presentations with a lot of animations and video content or if you are going to be playing games and watching movies on your laptop.

Unless you are on a very tight budget, stay away from the Passive Matrix displays like DSTN (Dual Scan Twisted Nematic) as these have very low response times and significantly lower brightness levels than TFT displays.

Screen size: For presentations and extensive graphics applications like 3D visualisation, movies, etc, go in for either a 13.3-inch or a 15.1-inch TFT as they offer as much viewing area as a 15-inch and a 17–inch monitor, respectively.

The big screen Acer TravelMate

Resolution: The resolution at which you need to run your laptop would depend on your screen size. For screens up to 13.3-inches, it would be best to run it at resolutions up to 800x600 while for larger screen sizes, you would run it at resolutions of 1024x768. Very few laptops allow for resolutions higher than these and very often, the text becomes unreasonably small at resolutions so high.

Simulating Real-world Applications

The most important tests in a computer are those that simulate real-world applications as these are the applications that you would be running for most of the laptop's life. Therefore, the weightage assigned to these tests are also higher than those allotted to the others. The Content Creation 2000 and Business Winstone 99 tests simulate all kinds of real-world applications that you generally use. These include simulation of software such as Adobe Photoshop, Dreamweaver, Word in Content Creation, and a simulated business environment with office tools such as Office 97, Corel WordPerfect, Lotus SmartSuite, Netscape, etc in the

Business Winstone test. **Zenith 21A**came out tops in the Content Creation test with a score of 24.7. Other laptops which did well were the ACI Profile III and Acer TravelMate. Obviously, the 128 MB RAM that these laptops carried was one of the main reasons that they did well in the Content Creation test.

Surprisingly, in the Business Winstone, the **IBM Thinkpad 734TL** came out with the best scores. A high score in this parameter indicates that the I/O system is really sturdy and useful for people who run all kind of business applications. It is also a reflection of the speed of the hard disk subsystem.

ZD Winstone99

Acer TravelMate 734TL	21.4
ACi Concept	22.6
ACi Precedent	22.5
ACi Profile III	23.1
ASUS 7300E	18.8
ASUS 8400B	19.9
Compaq Armada 100S	10.6
Compaq Presario 12XL305	16.8
Compaq Presario 17XL361	Did not run
IBM ThinkPad A21M	25.8
Toshiba Protege 7200	10
Toshiba Tecra 8100	18
Zenith 21A	25.5

Content Creation 2000

Acer TravelMate 734TL	19.3
ACi Concept	19
ACi Precedent	17.7
ACi Profile III	20.4
ASUS 7300E	18
ASUS 8400B	17.1
Compaq Armada 100S	Did not run
Compaq Presario 12XL305	Did not run
Compaq Presario 17XL361	19.1
IBM ThinkPad A21M	19.1
Toshiba Protege 7200	8
Toshiba Tecra 8100	22.5
Zenith 21A	24.7

signs of motion blurring, which implies that the quality of the TFT and its response time is good. Almost all the screens were good except for a few such as the Compaq Armada 100S and the ACI Profile III.

The one that did really well in this test was the **Acer TravelMate 734TL,** boasting of a very crisp TFT display with virtually no signs of motion blurring during video playback.

Graphically yours: The graphics sub-system of a laptop needs to be good only if you need to run extensively taxing applications such as 3D games and 3D authoring software. Most laptops come with very basic video capabilities and are definitely not suited for intensive graphics processing. However, the newer breed of power laptops are very capable of running some of the most demanding graphics applications with the same ease as their desktop counterparts.

If a laptop can run games on it without any problems, it can be considered to be good as games are one of the most intensive tests for computer systems and especially for the graphics sub-system. Notebooks usually lack a good graphical sub-system, thus making hardcore gaming usually impossible on it. These days, companies such as nVidia and ATi are entering the mobile GPU market by creating processors, which can give a laptop user a desktop-quality gaming and graphics performance.

To check the graphics sub-system, we ran the *Quake III Arena* test—the ultimate test for checking the gaming performance of a computer laptop. If Quake's main

Quake III Arena test

menu showed up, it meant that the laptop's graphical sub-system had OpenGL support. Among all the laptops on which this test was run, the best performance came from the **ASUS 8400E** followed by Zenith. ASUS gave a highly playable 30.1 fps in normal mode, while Zenith lagged slightly behind with 30 fps. The Acer

Battery Uptime (hours)

Acer TravelMate 734TL	2:09
ACI Concept	1:52
ACI Precedent	1:05
ACI Profile III	1:25
ASUS 7300E	0:04
ASUS 8400E	1:51
Compaq Armada 100S	Errors
Compaq Presario 12XL305	1:30
Compaq Presario 17XL361	2:16
IBM ThinkPad A21M	1:21
Toshiba Protege 7200	2:10
Toshiba Tecra 8100	2:45
Zenith 21A	1:57

TravelMate 724 and the IBM Thinkpad also had support for OpenGL, though the frame rates weren't that impressive.

Staying power: When you are on the road and working away at that complicated and critical business plan, you don't want to be left stranded because you've run out of battery time.

The battery is the only source of power for a laptop and becomes critical when you are on the move and are away from a power source. A high-end laptop with a weak battery doesn't make much sense, especially if you are planning to be mobile most of the time.

Almost all laptop processors feature some form of power management that helps in stretching the amount of time

Battering your Battery

Everything from the processor to PC cards has an effect on battery life. The faster your processor, the bigger your screen and the more the number of peripherals your computer has, the greater is its power consumption. Therefore, it would be a good idea to disconnect seldom-used peripherals from your laptop to squeeze that extra juice out of your laptop's battery.

If you're looking for long battery life and that extra power on the road, go in for a laptop with a Lithium-Ion (Li-Ion) battery (as opposed to a Nickel-Metal Hydride (NiMH) battery) as these are the most advanced forms of power storage for a notebook. Though more expensive than NiMH, a Li-Ion battery delivers more power. Also, the life of a Li-Ion battery is much higher than that of NiMH. To optimise battery life, see that you have enabled all forms of power saving from the BIOS of your laptop and also from the operating system.

Go, Graphics, Go

ATi and Matrox were two companies dominating the 3D card market for notebooks with their not-so-powerful cards. nVidia, on the other hand, is aiming to make the best 3D card which at the same time doesn't hog much power. The GeForce2 Go graphics processor is in that sense a modified version of the very popular GeForce 2 MX graphics processor, which is already a scaled down version of the GeForce 2 GTS. Although the GeForce 2 Go chipset takes up 2.9 W of power, it is much more powerful than the ATi Rage Mobility 128. The chipset offers hardware DVD decoding and AGP 4x fast write modes. It allows the use of an external CRT or even an OHP screen. Given this scenario, even ATi is joining the race of creating the best graphics processor unit for the mobile computing industry. It has plans to come out with a mobile version of the ATi Radeon.

that you can use the laptop for when it's working on battery power. For example, Intel uses SpeedStep technology, which allows the processor to use a lesser amount of power (and run slower) when running non-demanding applications like word processors, spreadsheets, etc (*see box, 'Beefing down Power'*). The beauty of this is that the process of slowing down the processor is transparent to the user because of the nature of the application that is being run.

Mobile processors are also created such that they run at a slightly lower core voltage and therefore use less power compared to their desktop counterparts running at the same speed. This also results in correspondingly lower amounts of heat generation—so your lap won't overheat when you're computing in your car!

In the battery test, the batteries were charged up to 100 per cent and then a test was run which constantly accessed the hard disk with the brightness and contrast set to maximum.

Also, all power saving features within the BIOS were disabled prior to running this tests, so as to single out the battery sub-system. Power saving features and other technologies such as SpeedStep were disabled.

Only four laptops gave battery uptime of more than two hours, making them ideally suited for life on the road. The **Toshiba Tecra 8100** topped with a battery uptime of 2 hours 45 minutes.

Muscular Build

Tough casing: Some laptops are fabricated with exotic materials like toughened plastic (that is sometimes even bullet proof!) or Titanium (the material used in the fabrication of parts of the Space Shuttle Challenger!) At the least, ensure that your laptop is constructed in a sturdy fashion and that there are no breakable parts like retractable flaps. Two important points to look out for in evaluating the build quality of laptops would be the integrity and the firmness of the CD/DVD drive tray and the hinges of the screen. See that these are sturdy and are not easily susceptible to damage due to rough treatment.

Spill-proof LCD and keyboard: The keyboards of most notebooks are membrane keyboards, meaning that even if you drop liquids on them, all you'd have to do is turn over the laptop, dust it out and continue working. So go ahead…enjoy that cup of coffee and don't worry about spilling it while you are typing.

Shock absorbers to protect internal components: Some exotic laptops have special materials used to encase sensitive internal components. These impart resilience to your notebook computer, letting it withstand all those bumps and jerks of the speed breakers and potholes on the roads.

All those features

How well a laptop serves your needs also depends on what all you can do with it. Does it allow you work with office applications? Send and receive e-mail? Browse the Net? In short, if you are a corporate user, does your laptop allow you to take your office with you?

Apart from the core performance, we also looked at certain aspects such as the kind of features the laptops came with. These included the processor speeds, the memory, documentation, number of ports, etc. Screen size was another very important feature to look out for. The pre-installed software or bundled applications were also noted.

Almost all the laptops came with Windows 98 SE pre-installed. Some also had Windows Me as part of the package. Surprisingly, there were some hard disks that had no operating system installed such as the ACI Profile III and the ACI Concept. These hard disks needed partitioning and then Windows had to be set up on them. **Zenith** was one of the best laptops in terms of features with an excellent set of peripherals such as the additional PS/2 mouse, mouse pad and a very snazzy carry-case.

Rugged by nature

A laptop, which is not built to be mobile and sturdy while travelling, defies the aim of owning a laptop. If a laptop is sturdy and tough, it'll most probably be heavy. But if a laptop can be light and sturdy at the same time, there's nothing like it. All the laptops that we tested were quite sturdy and it was quite difficult to differentiate between the laptops in terms of raw build quality. We also checked the build quality of the laptops by checking for factors like potentially loose

Weight (in kg)

Laptop	Weight
Acer TravelMate 741L	3.17
ACI Concept	2.8
ACI Precedent	2.7
ACI Profile III	2.1
ASUS 7300E	2.77
ASUS 8400R	2.9
Compaq Armada 100S	3
Compaq Presario 12XL305	3.32
Compaq Presario 17XL361	2.3
IBM ThinkPad A21M	2.77
Toshiba Protege 7200	2.2
Toshiba Tecra 8100	2.8
Zenith 21A	2.8
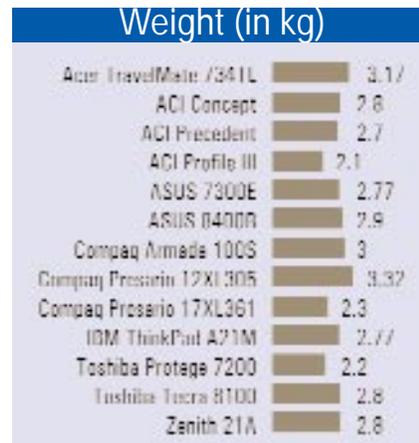
keys, faulty and flimsy screens, the construction of the CD/DVD drive tray and other flaps and covers that could possibly be subject to damage. Based upon these observations, we found that the sturdiest of the laptops was the **Zenith**, which was quite stable and not overly heavy either. The keys of the laptop were quite firm, thus giving a conventional desktop keyboard feel to it. The screen was also quite good in terms of sturdiness and so was the overall construction of the TFT. There were other laptops that were as sturdy as Zenith but were quite heavier in comparison.

Good by money

The prices of laptops have been falling over the years and it's quite possible to get a good bargain at a very reasonable price today. Obviously, a feature-packed laptop will be priced considerably higher than the rest, but that's where you have to make a trade-off. Today, the price range of laptops in the market is anywhere between Rs 60,000 to over Rs 2 lakh.

Optimise the Goodies

In choosing the best laptop for your needs, there are a set of parameters that you would need to look at before going out and buying it.

System configuration: See that you have the necessary software and operating system installed so that all the applications you plan to run on it are compatible.

Also see that you have the necessary support for the graphics hardware in terms of drivers.

Integrated networking: If you plan to use your laptop in an office environment, verify that your notebook has a LAN card or is upgradeable to support one.

Management software: Management software are capable of diagnosing the system and creating a report that can be sent to the service centre or even provide you on-the-spot assistance. In case of a system crash, such a software could mean the difference between making that presentation that is scheduled in two hours or missing out on that business deal.

Removable drives: If you do not plan to use peripherals like the CD-ROM drive and the floppy disk most of the time, buy a laptop that features detachable drives. This allows for greater flexibility in the notebook's configuration and also results in a much lighter notebook.

Multi-purpose bays: You can interface your laptop to other peripherals through USB, serial, parallel and even FireWire ports. This is achieved by using docking stations that work as multi-purpose bays. However, these docking stations are generally not part of standard notebook accessories and need to be purchased separately. Verify that your notebook does offer the capability of docking station interface.

Built-in modem: Now that every computing device worth its name is capable of being connected to the Internet, so should your laptop. Ensure there's a modem.

Keyboard: This is the peripheral that you will be most in contact with. The keyboard should have at least 84 keys which should be comfortable and tactile while typing. Too much play in the keys generally results in an uncomfortable typing experience and could get very frustrating after a point. Try it out first.

Pointing devices: The trackpad and the pointing stick are two of the most common pointing devices. Try them out and check whether you are comfortable with using them.

The configurations also range from a 233 MHz Pentium processor to even a full-blown Mobile Pentium III 800 MHz processor with technologies like Speed-Step. The size of the screen and additional peripherals like a DVD drive are some other options that may add to the price of the laptop, though they do give you additional overall value.

When measuring this criteria, **Zenith** did quite well in the performance tests and at Rs 1.25 lakh is relatively not all that expensive. On the other hand, if you want a notebook just for the sake of having computing power at the lowest possible cost, then you can go in for one of those 'economy' notebooks, such as the Compaq Armada 100S or the Compact Presario 12XL305. Such laptops do not have a very high-end processor but the prices generally range from Rs 60,000 to Rs 80,000, putting them well within the range of most potential notebook customers where price is a concern.

There are also sub-notebooks that have processors with speeds of 166 MHz. These ranges tend to be a bit bulkier. The performance of these systems isn't anything to write home about. The two sub-note-

Beefing down Power

Intel is out with its new series of processors for the notebook market that also provide some additional value. The new Pentium III Mobile processor series, starting from 600 MHz, have SpeedStep technology built into its core. This technology enables the changing of frequency and voltage depending on the requirements of processor power.

The speciality of this technology is that these parameters can be changed on-the-fly and it does so by analysing what applications are being run on the notebook and allotting the requisite power.

When the notebook is plugged into AC power, it automatically switches the power to its maximum. This switching of frequencies and voltage is very fast and the time taken for the process is negligible and therefore transparent to the user and the application being run. The processor also allows the user to switch frequencies manually. The Pentium III 700 MHz processor with Speed-
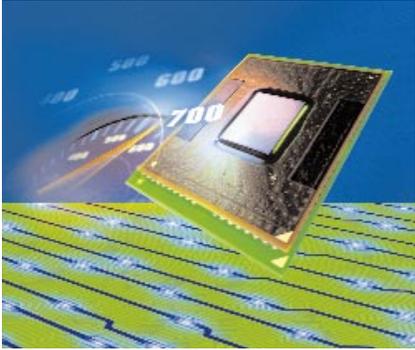
Step technology can underclock itself to as low as 550 MHz, according to the power available. AMD is also soon coming out with its mobile processors, codenamed Gemini, with power saving features to compete with Intel's SpeedStep technology. Intel, on the other hand, is vying to be the first processor manufacturing company to make a 1 GHz mobile processor.

books we received were the CivilNote 100 and CivilNote 1000. These notebooks have processor speeds ranging from 233 to 266 MHz with 32 MB of RAM and a 3.2 GB IDE hard disk drive. The 24x CD-ROM drive is external to the system.

SCOREBOARD Specifications

LAPTOPS AT A GLANCE													
Name	TravelMate 734TL	ACI Concept	ACI Precedent	ACI Profile III	ASUS 7300E	ASUS 8400B	Armada 100S	Presario 12XL305	Presario 17XL361	ThinkPad A21M	Protege 7200	Tecra 8100	Zenith 21A
Contact													
Manufacturer	Acer	ACI	ACI	ACI	ASUS	ASUS	Compaq	Compaq	Compaq	IBM	Toshiba	Toshiba	Zenith
Dealer	ACER India	ACI-India	ACI-India	ACI-India	Rashi Peripherals	Rashi Peripherals	AVI Electronics	AVI Electronics	AVI Electronics	AVI Electronics	HCL Infosystems	HCL Infosystems	Zenith
Phone	080-2280812	022–2814359	022–2814359	022–2814359	022-8260258	022-8260258	022-6465522	022-6465522	022-6465522	022-6465522	011-4442381	011-4442381	022-8377300
E-mail	vs_robert@ acer.co.in	sales@ aci-india.com	sales@ aci-india.com	sales@ aci-india.com	ho@rptech india.com	ho@rptech india.com	aviteam@ vsnl.com	aviteam@ vsnl.com	aviteam@ vsnl.com	aviteam@ vsnl.com	response@ hclinsol.com	response@ hclinsol.com	NA
Price (in Rs)	2,09,000	1,15,990	1,64,990	1,25,000	1,50,800	2,04,100	79,900	89,995	1,39,990	1,73,000	2,10,000	2,40,000	1,25,000
Specifications													
Processor	600 MHz Pentium III	700 MHz Pentium III	700 MHz Pentium III	700 MHz Pentium III	500 MHz Pentium III	500 MHz Pentium III	533 MHz AMD K6-2	Intel Celeron 600	700 MHz Pentium III	800 MHz Pentium III	600 MHz Pentium III	700 MHz Pentium III	600 MHz Pentium III
RAM	64 MB	128 MB	128 MB	128 MB	64 MB	64 MB	32 MB	64 MB	64 MB	64 MB	64 MB	128 MB	128 MB
HDD	11.5 GB	5.7 GB	10 GB	6 GB	6 GB	6 GB	5 GB	6 GB	14 GB	18 GB	11.2 GB	11.2 GB	9.1 GB
Display size (in inches)	14	13.3	14.1	13.3	13.1	NA	12.1	13.3	13.3	14	13.4	14.1	13.3
Display card	ATI Mach64	SiS 630	Silicon Motion	Rage LT Pro	Silicon LynxEM	S3 Savage MX	Trident Cyberblade i7	Trident Cyberblade i7	Rage Mobility M1 AGP	Rage Mobility	Trident Blade	S3 Savage MX	S3 Savage MX
Weight (in kg)	3.17	2.8	2.7	2.1	2.77	2.9	NA	3.32	2.3	2.77	2.1	2.54	2.8
Dimensions (lxbxh) (in inches)	12.8x10.7x1.42	12.36x10.07x 1.51	12.75x10.62x 1.17	12x9.1x1.1	11.6x9.1x1.5	12.2x10.0x1.3	NA	1.7x12.2x10.08	1.29x12.08x 10.37	12.5x10.5x1.4	11.7x9.9x0.92	12.28x10x1.46	11.6x9.1x1.5
Benchmarks													
Content Creation 2000	19.3	19	17.7	20.4	16	17.1	Did not run	Did not run	19.1	19.1	8	22.5	24.7
ZD Winbench99	21.4	22.6	22.5	23.1	18.8	19.9	10.6	16.6	No	25.8	10	18	25.5
Photoshop (in seconds) *	187.57	188.13	220.5	175.23	239.93	210	319.8	291.37	191.43	220.57	204.33	172.47	145.63
Quake III Arena (fps)	15.3	Did not run	Did not run	Did not run	Did not run	30.1	4	9.8	Did not run	16	10	10	30
Battery test (in hours)	2:09	1:52	1:05	1:25	0:04	1:51	Did not run	1:30	2:16	1:21	2:10	2:45	1:57
Overall Performance	71.06	62.29	56.49	62.32	49.46	64.74	24.43	41.59	49.99	67.92	49.95	71.96	83.22
Rating	A	B +	B	B +	B	B +	B -	B	B	B +	B	A -	A

* Lesser time indicates better score

NA indicates not available

Decision Maker

Desktop Replacement	Performance	Zenith 21A
		Acer TravelMate 734TL
	Price	Zenith 21A
		ACI Concept
Mobie Warrior	Performance	Toshiba Tecra 8100
		IBM Thinkpad A21M
	Price	ACI Profile III
		Compaq Presario 17XL361

Desktop replacements tend to have high-end specifications and therefore weight is not a consideration
The Mobile Warrior notebooks are for those who are constantly on the move and therefore weight becomes a consideration

Book your Mac now

For all those Macintosh fanatics out there, the Apple iBook is one notebook that could definitely make a first-time onlooker drool. Its sleek design beats just about every PC notebook. This very pretty exterior hides a seriously tough casing that is built to withstand the toughest of bashing and harsh treatment—ideal for life on the road. The iBook is powered by a G3 processor with speeds of either 366 or 466 MHz and has 64 MB (upgradable to 320 MB) RAM. It includes speakers and a CD-ROM drive and the touchpad serves as the pointing device. It also comes with an in-built

modem and network interface. Unlike other laptops, the iBook has a handle on the laptop itself that eliminates the need for any extra bag to carry the notebook, though, compared to most laptops, the iBook is on the heavier side. At Rs 1,09,000, the laptop isn't priced too high and is cheaper than most conventional PC notebooks.

CONCLUSION

In a world where increasing stress is being laid on being mobile and with continually falling component prices, it is not going to be very long before laptops achieve the portability of cellular devices. Depending upon your budget, target application and usage, there's literally a laptop for everyone.

Zenith 21A emerged the winner by doing well in most of the tests. With features such as a powerful 600 MHz Coppermine processor, 128 MB of RAM, a 9.1 GB hard disk and a desktop graphics-quality S3 Savage MX 3D processor, you can finally make those last minute tweaks and renderings of that 3D architectural drawing while in your car.

For those not used to the trackpad, this laptop also bundled an external mouse as part of the package. Best of all, the price tag of this notebook makes it a very worthy buy.

The other laptops that did well were the Toshiba Tecra 8100 and the Acer TravelMate 734TL. Besides the mandatory instruction manuals and the driver CDs, both these models included peripherals like the external CD-drive and floppy with the Protege. The build quality was also quite sturdy compared to the rest of the laptops in this range.

The Tecra 8100 also gave the best results in the battery uptime tests with standby power for at least 2 hours, therefore making it ideally suited for those on the move. With 128 MB of RAM and a Pentium 700

The Zenith 21A emerging the winner

MHz Pentium III processor, the Tecra 8100 is also quite a good performer and came second in the overall performance scores. The price is the main factor which acts as a deterrent against this laptop.

Among the road warriors, the Toshiba Tecra 8100 was the highest performer with the lowest weight. The IBM Thinkpad with a number of good features, and also weighing less, is a good buy too. IBM performed quite well in the Winsone test, making it ideal for real-world applications.

Priced at Rs 1.25 lakh, the Zenith 21 A was surprisingly also the cheapest laptop for the best performance. The other well-priced laptops were the ACI Profile and the ACI Concept. The ACI laptops did do quite good in all the tests but were left behind because the build quality, especially of the TFT screen, was not up to par compared to the other laptops in this range.❖

Mr Fixit's
Toolkit

System crashes might be commonplace, but data losses are something that cannot be tolerated. Get yourself a system utility and protect your data

ALIASGAR PARDAWALA

You just got a new PC, loaded the operating system and installed all that cool software. You felt on top of the world. After the calm came the storm. All the cool stuff started giving you sleepless nights. Frequent crashes, corrupt registry, lost files and Windows shutdown became the order of the day, especially when you least expected it.

The Windows operating system, or for that matter, any operating system will crash at some point of time or the other. Most of the time when it does, you will find that you haven't saved the data and will have to start from scratch. There are many reasons for this—but the main safety precaution you failed to take while installing all this software is that you didn't install a system utility software. System utility tools try to ensure that

Photograph: Ashesh Shah

your computer is in ship-shape condition at all times and prevent any data loss even if the OS crashes.

The most popular system utility suites available are Norton SystemWorks 2001, McAfee Office Central and Ontrack SystemSuite 3.0. These complete suites bundle with a number of smaller utilities that protect your computer. This could include anti-virus packages, firewalls, disk tools, etc. Instead, you could also opt for any of the freeware or shareware utilities available on the Net. Each utility is basically for a specific task such as disk maintenance, crash protection or registry optimisation. In all, we tested the three complete suites along with six shareware utilities.

TEST PROCESS
The Test Bench consisted of a Coppermine 500 MHz with 128 MB of RAM and a 20 GB hard disk. Two partitions of 10 GB each were made on the hard disk. The second partition was used to store all the programs installed to measure CPU load and RAM load. The disk was formatted and Windows 98 SE was installed as the OS. To measure registry optimisation and disk fragmentation, five software—Microsoft Office 2000, Microsoft Visio 2000, Fine Reader, Adobe Photoshop 5.5 and Text Bridge Pro—were installed. The system suites were tested on three basic parameters.

The Ease of use parameter was assigned 15 per cent weightage, 30 per cent went to features and 55 per cent was assigned to the performance

Measuring System Loads

The load on CPU is most when you are multitasking or running graphics-intensive games or applications. To monitor this, almost all the main suites had a CPU usage meter built into them. This is a small program which rests in your System Tray if kept active and does not eat much of your system resources. You can simply click on the icon to get the current CPU usage. We tested two shareware utilities, CPU Load and CPUGH and measured the lag time before these utilities came up with the CPU

Load figures. We loaded Winamp and noted the lag time. CPU Load responded immediately and reflected the change in the CPU utilisation.

The Norton Doctor CPU usage meter wasn't that fast and took a few moments more to reflect the change. Even CPUGH noticed the change in utilisation immediately, but was hampered due to the lack of representation in text form. This program is just 16 KB and doesn't interfere with the running of the PC.

test. In the performance test we noted various aspects such as registry optimisation, defrag time, CPU load, etc.

Ease of use
A software may be bundled with features and also perform well on each score, but if using the software drives you nuts, then probably the features and performance are of no use. The first thing we did to measure the ease of use was look at the install process.

Installation: Some software tend to take up a lot of time, while others are jet engines in the installation race. Ontrack SystemSuite proved to be the jet engine with a blazingly fast installation—the installation was over in just 1 minute 13 seconds. The reasons for this may be the fact that the install size of Ontrack was just 68.5 MB, almost half that of the 126 MB for Norton SystemWorks 2001 and 120 MB for McAfee Office Central. However, this does not mean that Ontrack had lesser features or utilities bundled. It had all the utilities that the other two had (almost 30 sub-utilities) and, in fact, even bundled a few additional utilities. For these many utilities, the space requirements and install time was truly amazing. You also had the option to select the utilities that you wanted to install. With Norton, you should select only the ones you require, since installing the entire suite tends to slow down the system substantially.

Ontrack and Norton SystemWorks came with a bootable CD. This is quite useful if you are unable to boot from your hard disk due to some problems. You can boot off the CD and run the

Contents

Installation Time

McAfee Office Central — 4 minutes 19 seconds

Norton System Works 2001 — 4 minutes 32 seconds

Ontrack Systems Suite 3.0 — 1 minute 13 seconds

Defragging RAM: Worth it?

They go by different names and identities but they all claim to do that same wonderful thing—'defrag your RAM' and enhance performance. You may even have used these utilities. There have been different reactions with respect to the usability and the effect of these software. Some have claimed that they actually free up your system resources while others have dismissed them as completely useless programs. Most of the time, after running these little utilities that claim to do so much, the little memory slider on the indicator of the program does seem to indicate that it has done something with the entrails of your memory sub-system. But after using these software for a reasonable amount of time, do they really make a difference? A working difference? In most cases, the answer is no. After the initial expectations and thrill of using a new software, the RAM defrag utilities don't really amount to much and the end result is really not what they claim it to be. We wound up uninstalling them after a period of usage and discovered that there were no real, visible results when using them in day-to-day life.

Depending upon your experiences with these software, you may have different views. For more information on such type of software, check out www.radsoft.net/resources/software/reviews/rr/ and decide for yourself.

diagnostic utilities. There's one slight problem with Norton that it cannot read NTFS drives from the bootable CD. Unlike most other software, Norton didn't ask for a CD key because Symantec claims to believe in its customer.

OS support: Since Microsoft has been coming up with a number of new operating systems in the last year, it is important that the suites lend support to all the OS. Norton SystemWorks had support for almost all the operating systems, which included Win 9x/Me/NT/2000 and Ontrack followed suit with support for all of these.
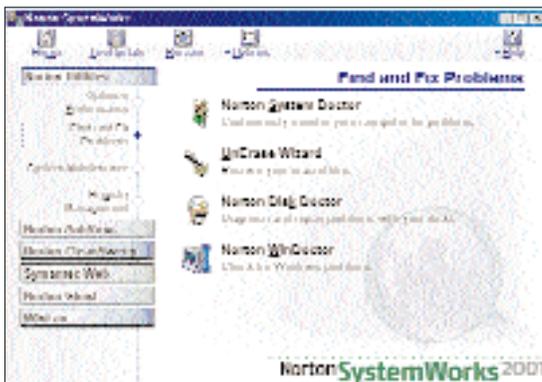
Access all the utilities from one place in Norton

Interface and documentation: Once you installed the software, all of them could be easily accessed from one single place. There weren't too many options for customisation in the form of skins or configurable options. While the interface of all three suites was equally good, we particularly liked Norton's interface with its one-place, quick-launch access for all the utilities and sub-utilities.

The software came complete with detailed manuals, which were a big help. The information was arranged in a precise and easy-to-understand manner, and even a person using it for the first time shouldn't have much difficulty in understanding it. Each utility also had its own help icon, though if you regularly use the wizards you will not actually need any help.

Features

As the saying goes, it's not quantity but quality that counts. Ontrack and McAfee bundled around six utilities with their suite, while Norton came with only five. The main utility that Norton lacked was the crash

protection feature, which strangely enough was present in the earlier versions (*See box, 'Illegal Errors'*). McAfee also bundled its firewall utility along with the suite to give a complete protection. All the suites had the standard virus scanner, disk tools, registry optimisers, uninstallation and clean-up utilities. An additional utility that bundled with SystemWorks was the Winfax basic edition. As the name suggests, this utility allows you to fax directly from your PC and is more of an office productivity tool than a system utility.

An interesting utility with McAfee Office Central is the Launch Rocket. Its function is to reduce the time taken by the application to load. This is done by compressing the files needed for startup into a single folder on the hard disk and retrieving it from this place when the application is launched. The Launch Accelerator wizard simplifies this task for you. Win Customizer, on the other hand, which comes with Ontrack, also lets you tweak your Windows settings and set up your hardware functionalities.
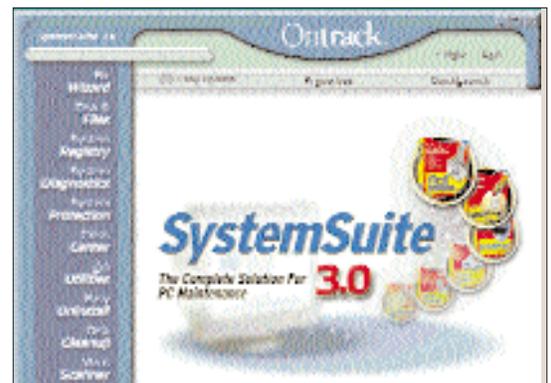
The feature-rich Ontrack suite

With the Clean Sweep utility in SystemWorks, you can clean unnecessary files and folders, browser cache, plugins, cookies and other ActiveX controls. The Smart Sweep option in this utility monitors all new installations and pops up whenever you start the program installation. It can be utilised if you want to install an application later.

Ontrack also ships free with PowerDesk4, which is a file management utility with the capability to open more than 200 file formats. If you are considering a feature-rich application at a low-cost, then Ontrack would be quite ideal for you.

Performance

The most important parameter is the performance criteria, where you actually ➜

Installation Specifications

Product	Install size	Time taken to install	System requirements	OS support
McAfee Office Central	120 MB	4 minutes 19 seconds	Pentium 100 MHz, 32 MB RAM	Win 9x/Me
Norton System-Works	126 MB	4 minutes 32 seconds	Pentium 100 MHz for Win 9x and 150 MHz for Me, 32 MB of RAM and 186 MB hard disk space	Win9x/Me/NT 4.0/2000
Ontrack SystemSuite	68.5 MB	1 minute 13 seconds	486, 16 MB RAM, 60 MB hard disk space	Win9x/Me/NT 4.0/2000

Bundled Utilities

Product	Utilities
McAfee Office Central	Nuts and Bolts, First Aid, 2000 Toolbar, McAfee Virus Scan, Hurricane 98, McAfee Firewall, Oil Exchange for updates
Norton SystemWorks	Norton Antivirus, Norton Utilities, Norton Clean Sweep, Norton Ghost, Winfax Basic
Ontrack SystemSuite	Fix-it-Utilities, Crisis Center, Virus Scanner, EasyUninstall, DataEraser, Crash Proof plus PowerDesk 4

measure how the software perform with respect to the stated features. We looked at a number of criteria such as the defrag time and the registry optimisation feature. While these tests were being performed, we also looked at the load the utility puts on the system. The increase in boot-up time was also noted with default startup settings.

Defrag: Every time you add some new software or for that matter copy or delete files, the hard disk gets a bit messy. By this we mean that depending on the location of the free space in the hard disk, files get copied on to that cluster. So, for a particular program, the files may be scattered across the hard disk. Naturally, the hard disk now has to spend more time in accessing files of a particular program. Instead, if all the files were located in one place, then the time taken to access the program, save a particular file or copy data would get considerably reduced. This is where defrag comes into the picture. All the system suites shipped with a defrag utility that ensured that files in a particular folder or of a particular program were located next to each other in the hard disk. To speed up your computer, it is recommended that you defrag your computer regularly.

We tested the three suites in terms of the time taken to defrag the primary partition (10 GB in size) of a 20 GB hard disk. We copied test files totalling up to 424 MB in different folders and at random deleted certain files. This was done to fragment the hard disk to some extent. The defrag utility of the suites was then run. The time taken to defrag normally depends on the state of fragmentation and the capacity of the disk. In the tests, we noted that Norton's Speed Disk outperformed the rest. It only took 14 minutes to defrag the disk, which is quite fast. Ontrack's JetDefrag, on the other hand, took 48 minutes, which is average. The most disappointing was Disk Tune of McAfee which took 2 hours and 21 minutes—you could probably watch an entire Hindi film in that time! And just for comparison, Windows' in-built defrag utility took around 29 minutes.

We were amazed by the test results of Norton and just to ensure that we hadn't gotten it wrong, we performed the test a couple of

times more and came up with the same result. The time taken for defrag is quite important since there's a tendency among office-goers to leave the machine powered on at the end of the day and let it get defragged by the morning. With Norton, you will probably just have to spend 15 minutes extra in the office.

Registry optimisation: Ever accidentally deleted a program folder to remove a software and then faced the constant messages of missing software? That's because even though you have deleted the folder, the registry still contains 'stray' entries, which refer to the deleted software. Many a times, even if you use the uninstall program of the software, not all the entries are removed from the registry. While you can go about manually finding entries relating to that software using the registry editor and then deleting them, this can be quite dangerous, not to mention cumbersome. In addition, a bloated registry also slows down the start-up process. Registry optimisers are supposed to help you in this task by removing all stray entries and compacting the registry. The operative word is 'supposed to' because we found that none of the three suites actually did well in this test.

To test these suites, we deleted the five software manually by just removing the program folder. We noted the registry size before these software were installed and also after the installation of these software,
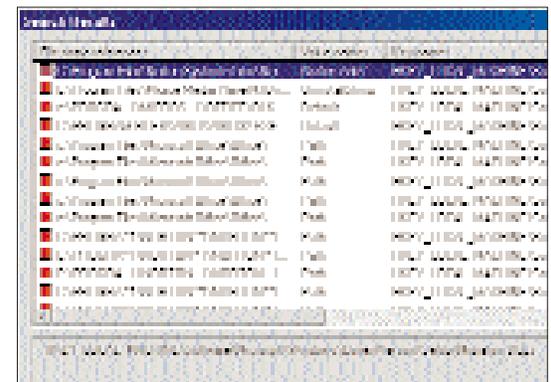
Redundant registry entries—time for optimisation
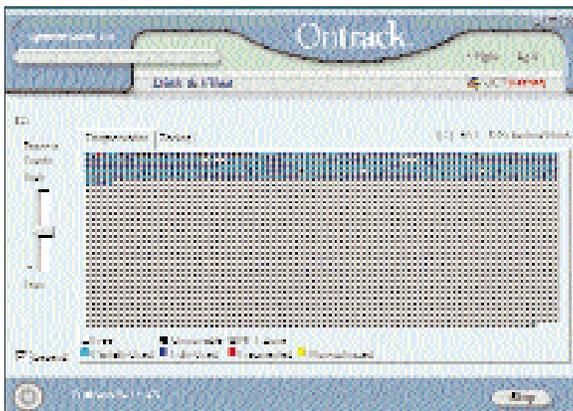

Ontrack's defragmentation in progress

How they Performed

Product	Defrag time	Reduction in Registry size	CPU Load	RAM Load in MB	Boot-up time in seconds
McAfee Office Central	2 hrs 21 min 31 sec	0.28	29	29	40.82
Norton SystemWorks	14 minutes 3 seconds	0.17	34	34	25.14
Ontrack SystemSuite	48 minutes 18 seconds	0.36	24	24	67.78

Performance Load

Whenever you install a software, it increases the time taken to boot-up. Also, while you are running the software, there's an additional load on the CPU as well as the memory. The best software is one which is able to maintain an optimal balance between features and load, and does not interfere much in the booting time. System utilities, in that sense, aren't that great when it comes to maintaining a balance. As can be seen from the graphs, Ontrack doesn't increase the boot-up time significantly, but it definitely hogs a lot of memory. In this case, the RAM load of 67.78 MB with all the utilities running was quite high, especially if you consider the fact that most systems will not have more than 64 MB of RAM. So, it won't be possible to run all the utilities together, and it's better to run one utility at a time.
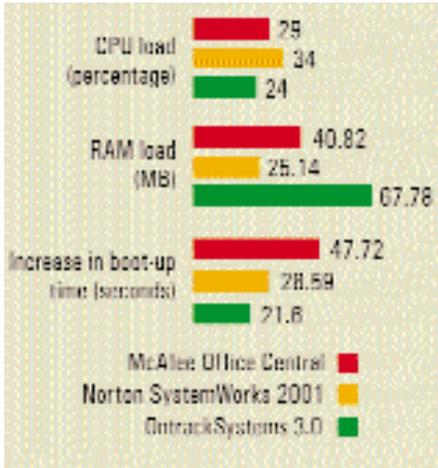
Again, with Norton, while the boot-up time increase and RAM load weren't that much, it ate up the maximum CPU resources. McAfee was on the higher side in most cases. So, while the minimum system requirements for these software isn't much, it is advisable that if you are planning to use these software on a regular basis, you have the system to maintain it.

the assumption being that the increase in registry size is due to these software. Due to the software installed, the registry size had increased as much as 4 MB. We then ran the registry optimisers of each utility, expecting to compact the registry to a great extent.

What we found was disappointing. Norton's Registry Sweep hardly cleaned the registry—it only decreased the registry by about 0.1 MB. McAfee performed only slightly better, decreasing the registry by about 0.28 MB. Ontrack's Registry Cleaner was the best, which doesn't say much because it just removed around 0.36 MB of the registry.

Apart from the three suites, there are other standalone registry optimisers that do the same function. We tested two such registry cleaners—NBG registry cleaner and SystemMechanic. Like the software suites, even these standalone cleaners weren't worth writing home about.

NBG found 118 stray registry entries and the file size after deleting the registry came down by only 11 KB, whereas System-Mechanic brought down the registry size by only 9 KB but detected 435 stray registry entries. This just goes to prove that registry optimisation is still a grey area and more work needs to be done by the developers.

So the final word is that the registry optimiser feature of all these system suites is hardly worth writing home about, and it's as if they didn't exist at all.

Illegal Errors

The blue screen of death is probably the last thing you would like to see on your screen. The moment it arrives you feel a lump in your throat for you realise that there's no option but to lose the data and restart the machine. There are several reasons why your computer suddenly

Crashproof your computer with Ontrack

hangs up. Software bugs, improper hardware driver, data conflicts, memory sharing problems, etc, are just some of the reasons why your computer might give you problems. It is especially troublesome when you install many different versions of the same software, resulting in overwriting of many of the important 'dll' files in Windows.

There are some utilities known as crash protection software, which claim to shield you from such eventualities. Ontrack and McAfee, for instance, come with the crash protection feature. Ontrack even allows you to auto-fix the crash in the background, but it's recommended that you don't use this feature for you may not know what exactly happens with your data. Instead, you can use the other feature which interrupts the crash and lets you save the data. Then you can exit the program and restart your computer. The same is true for McAfee Windows Guardian too, but here you have to keep the program active all the time.

The right price

When it comes to a price-performance ratio, Ontrack clearly comes out tops. Not only does it cost the least (Rs 3,000 approximately), but it is also feature-packed and gave quite a good performance in most of the tests. But the problem with McAfee and Ontrack is that the latest versions of their products are still not available in India, while SystemWorks 2001 is easily available. So, if you want to purchase either McAfee Office Central or Ontrack SystemSuite, you will have to order from their Web site. Hopefully, the products will be available soon in India.

All the software also come with update features. While Norton calls it Live Update, Ontrack has the Easy Update. These update tools work in the background when you are connected to the Internet and check out for updates to the various components. If some of the utilities (say, the signature file) have an update, it will prompt you to download the same. However, this automatic update feature is mostly time-bound in most suites. You also have access to online technical support in the form of e-mail.

How they Compared

	McAfee Office Central	Norton SystemWorks 2001	Ontrack SystemSuite 3.0
Ease of use			
Install size	120 MB	126 MB	68.5 MB
Install time	4 minutes 19 seconds	4 minutes 32 seconds	1 minute 13 seconds
OS support	Win 9x/Me	Win9x/Me/NT4.0/2000	Win9x/Me/NT4.0/2000
Bootable CD	No	Yes	Yes
Features			
Suites bundled	Nuts and Bolts, First Aid, 2000 Toolbar, McAfee Virus Scan, Hurricane 98, McAfee Firewall, Oil Exchange for updates	Norton Antivirus, Norton Utilities, Norton Clean Sweep, Norton Ghost, Winfax Basic	Fix-it-Utilities, Crisis Center, Virus Scanner, EasyUninstall, DataEraser, Crash Proof plus PowerDesk 4
Performance			
Defrag time	2 hours 21 minutes 31 seconds	14 minutes 3 seconds	48 minutes 18 seconds
Decrease in registry size	0.28 MB	0.17 MB	0.36 MB
CPU Load	29%	34%	24%
RAM load	40.82 MB	25.14 MB	67.78 MB
Increase in boot-up time	47.72 seconds	28.59 seconds	21.6 seconds
Contact			
Dealer	NA	Tech Pacific	NA
Phone	NA	022-5960101	NA
E-mail	NA	adil@techpacificindia.com	NA
Developer	Network Associates	Symantec	Ontrack
Web site	www.nai.com	www.symantec.com	www.ontrack.com
Price	Rs 3,300 (approx)	Rs 4,650	Rs 3,000 (approx)
Rating	**B**	**A -**	**A**

Ten Tips to Keep it Up

■ Enable DMA on your hard disk if it supports it. This results in less strain on your system's processor.

■ See that your system's drivers are up-to-date.

■ Keep only those applications running that you absolutely need. Disable applications from startup.

■ At least once every week, run a virus scanner on your hard disk and removable media that you use.

■ Run applications that are specifically written for your operating system.

■ If an application (especially beta software) repeatedly crashes, stop using it or obtain a stable version.

■ Defragment your hard disk regularly, especially after uninstalling or erasing data.

■ Run a thorough ScanDisk on your hard disk every month.

■ If you find that your system's hard disk is getting strained most of the time, invest in more RAM.

■ Ensure your hard disk is properly secured and there are no magnetic sources or equipment nearby.

CONCLUSION

There's no discounting the fact that system utilities are a must in every PC user's list. If you want to keep your system in tip-top shape, it is recommended that you regularly use the utilities.

Depending on your requirements, you can take two approaches—either make do with a shareware utility or go in for one of the suites. If you're the kind who likes having all the possible tools on hand in case you might need them, your best bet would be to go in for one of the feature-packed system suites tested. If, on the other hand, you just need a couple of importnat tools such as anti-virus and defragmentation utilities, opt for one of the freely downloadable software instead.

Of the three suites tested in this shoot-out, all were impressive when it came to the feature list. The number of features that Ontrack bundles are clearly better with as many as 30 utilities, and the PowerDesk utility with its file management capabilities is certainly quite good.

But when it came to actual performance, none of the software exactly measured up to the mark. McAfee in particular was quite disappointing as it lagged behind in most of the tests.

For the most part, Ontrack and Norton were running neck-to-neck. While Norton was quite impressive in the defrag test, Ontrack's install time was definitely far superior.

Again, if the RAM load in Norton was lesser, Ontrack did better when it came to the CPU load, though it took up too much RAM.

There was very little to choose between these two, but eventually **Ontrack SystemsSuite 3.0** came out best because of the overall performance, features and ease of use.❖

All you need to GNO

Linux developers would not have believed that so much effort would be spent in making the move towards graphical environments. But Linux has woken up to the potential of graphics, especially with GNOME 2.0

KIRAN JONNALAGADDA

The desktop environments in Linux were never anything to rave about. It's only when many players such as Corel and Mandrake started distributing Linux that an attempt was made to make Linux simpler for the home users. These initial attempts weren't exactly that great—the GUIs placed a great load on the system and hardly looked like a Windows substitute. Stability was also a crucial issue.

Now, GNOME is fast evolving to become a serious player in the desktop operating system market. While the project does not have the user interface development resources that Microsoft and Apple do, it is making up for it by borrowing ideas from the remaining contenders.

In the process, GNOME is growing up to be the ultimate desktop experience, not just in looks, but in usability too. GNOME 2.0 has many cool utilities as you will soon find out.

GNOME Icons

The GNOME Icons project, comprising volunteer artists from around the world, creates icons for all GNOME applications. Since Tuomas 'Tigert' Kuosmanen created the original set of icons including the GNOME foot logo, the GNOME Icons project tries to maintain his style and choice of light pastel colours. Icons are usually created using the Portable Network Graphic (PNG) format and include alpha transparency for effects such as shadow to work on a patterned background.

More information at:
http://gnome-icons.sourceforge.net
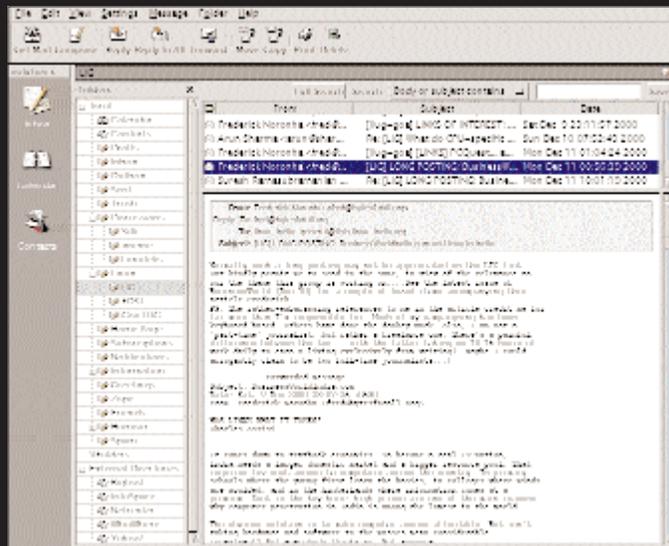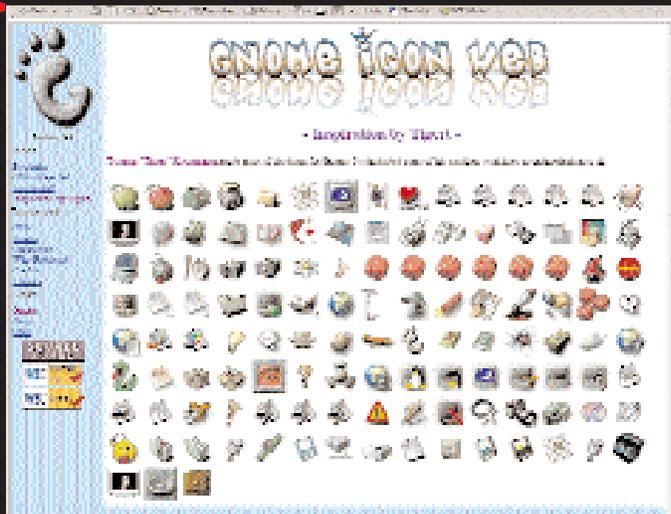
Evolution and Bonobo

Evolution is the upcoming mailer and scheduler for GNOME from Helix Code. There are two programs involved here: the evolution shell that controls navigation and the evolution mailer that controls the message index and message preview. The mailer connects to the shell as a Bonobo object. Bonobo (with ORBit) is GNOME's new object embedding system analogous to OLE and DCOM under Windows. With Bonobo you can create extensions to Evolution that behave like they are part of the original program. Evolution's mailer, calendar and contacts manager are all implemented this way.

More information at:
www.helixcode.com/apps/evolution.php3

Pango

The folks who made GNOME got tired of waiting for the XFree86 folks to deliver decent font support and created their own font rendering system. This system, called Pango, supports anti-aliasing and multiple languages. Because Pango is based on Unicode, multiple languages can now be used together, even in the same sentence. Here, you can see Pango rendering in Farsi, Tamil and Devanagiri.

More information at:
www.pango.org
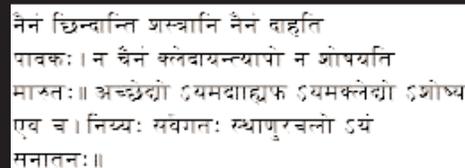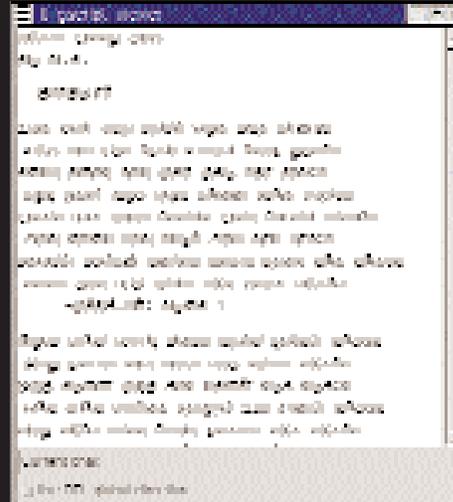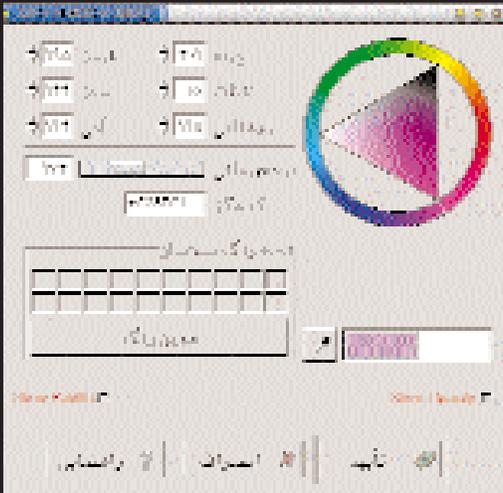
Meta Themes

GNOME applications can have a universal theme running through, thanks to the underlying Gtk+ widget library. Even KDE applications can sport this feature, and so can a number of other applications that are not directly related to either GNOME or KDE, such as XMMS and the various window managers. However, the theme engines for each of these are incompatible with the rest, and thus require themes to be created and applied separately.

The meta theme system attempts to fix this to some extent by making it possible to bundle together themes for various applications into one themeball, and applying them all at once. In the current system, the themeball does not actually contain the themes; it only contains a link to the theme file that the meta theme installer downloads and applies. Since theme files can be huge, running into many megabytes, this is useful if you have already downloaded a particular theme.

Bug-buddy

When a GNOME application crashes (which is very common in a development release), bug-buddy collects crash information and helps you file a bug report. You get e-mail notification when a developer fixes the bug.

KDE Dock Applet

Going one step further towards compatibility with KDE, GNOME now features a dock applet for KDE applications. More work on compatibility is happening behind the scenes. Both the desktop environments now share the same window manager specification and efforts are on to use common file formats.
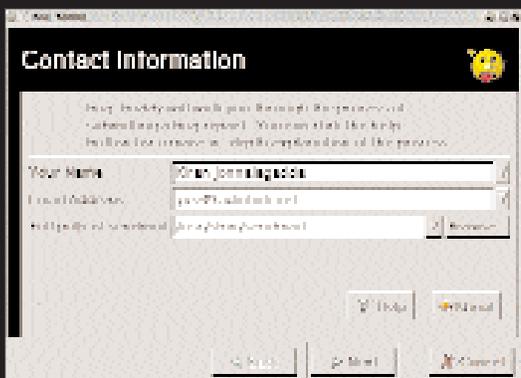
Configurable Panel

Older releases of GNOME only allowed for a thick fixed-width panel that could be aligned either to a screen-edge or a corner. Current releases allow for variable sizes and many more alignment options, including a free-floating panel.
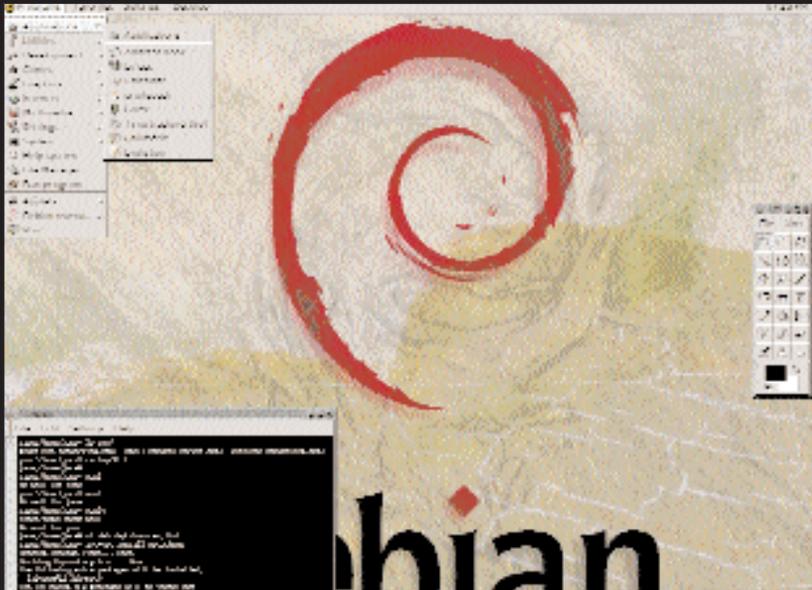
Menu Panel

GNOME now features a menu panel similar to the one in Mac OS. However, unlike the Mac OS and KDE menu panels, GNOME's menu panel can contain applets, but it cannot yet show menus from the currently active application. Instead, the panel shows a fixed set of menus similar to the Start menu under Windows.

Tear-away Menus

All menus in GNOME are now tearable. That means you can tear out a menu and keep it floating on the screen. This is very useful if you need to frequently access items from a particular menu, and is far simpler than customising a toolbar.

Fix it Up

We all know that the coolest part of open source is that if something doesn't live up to our expectations, and we are bothered enough to do something about it, nobody gets in our way. GNOME's no exception to this. If you think your layout for the File Open/Save dialogs will make the current ones look embarrassingly obsolete, or your Gtk+ theme is a welcome relief, let the rest of us benefit too. The GNOME User Interface Improvement Project has a home page at http://developer.gnome.org/gnome-ui/ and is in need of UI programmers, testers and designers. The UI Hit Squad works on solutions to interface issues that crop up periodically, and is the team you send your proposals to.

File Dialog

GNOME's current File Open and Save dialog menus are difficult to navigate and look like the ones in Windows 3.x. The GNOME UI hit-squad is working on creating improved dialog menus. Everyone is welcome to attempt improving the work of the hit-squad. The new dialog menus will also use the new GNOME-VFS libraries, which make it possible for a GNOME application to open files within an archive from another computer or over the Internet.

RADICAL
RADEON
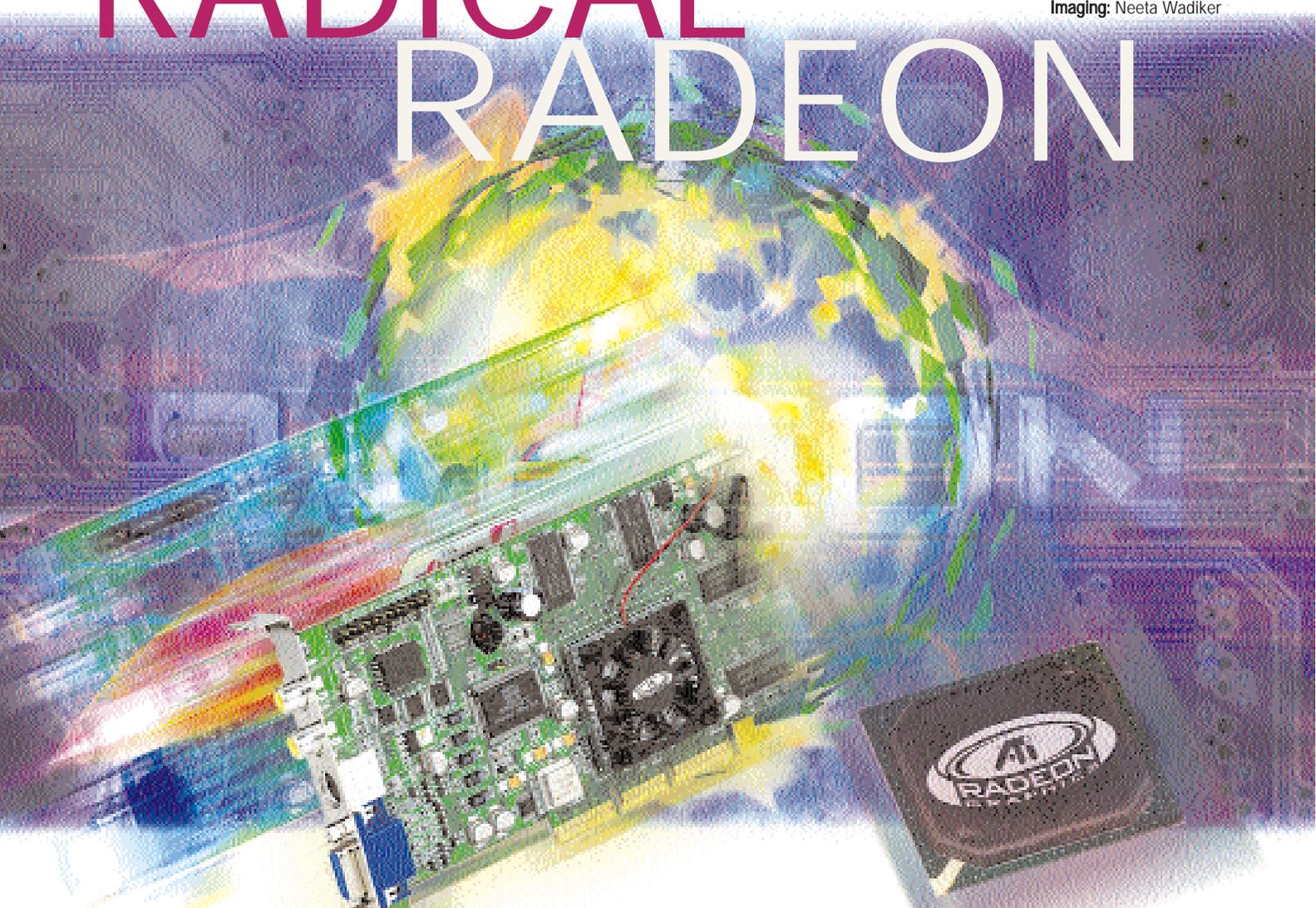
ATi's new feature-packed graphics card promises to give nVidia's GeForce line-up a run for its money

HATIM KANTAWALLA

One company that frame-hungry fanatics swear by is nVidia. Gaming enthusiasts had respect for only two companies in the 3D hardware scene—3DFX and nVidia. With nVidia buying out 3DFX, the graphics market was heading towards a Microsoft-like monopoly situation. Since the release of the Voodoo Killers (the GeForce line-up), nVidia has faced negligible competition. Given its aggressive half-yearly product release policies, very few companies have had the power and resources to launch products worthy of the competition.

ATi's Radeon plans to change all that. One of the big players in the PC graphics market, ATi held the largest share in the graphics chip and card market worldwide till some time ago. ATi's status comes from its huge original equipment manufacturers (OEM) market, the mobile graphics chip market and, of course, the exclu-

sive graphics cards it provides for the Mac. Despite a strong position, ATi was never able to get a footing in the niche market comprising performance and game freaks.

However, ATi has proved that it not only has the muscle but also the technical expertise to compete against nVidia. While everyone was playing catch-up, this OEM giant has launched the ATi Radeon 64 MB DDR VIVO—one of the most feature-packed cards to be produced in the commercial game-graphic arena till date.

A feature fiesta

With a feature list to die for, the Radeon beats every single graphics solution in its class. In addition, there are a bunch of cool features with catchy names such as the Charisma Engine—ATi's version of the integrated Transform & Lighting (T&L) feature of the nVidia GeForce line-up. Hardware-based T&L was first →

On your (bench)Marks

The Radeon shows impressive performance in all gaming benchmarks, though strangely it never manages to beat the GeForce2 GTS. But it does manage to place itself squarely between the GeForce DDR and the GeForce2 GTS. The *Quake III* scores in particular are very interesting. Here, all through there is a consistent difference of 10 per cent in scores except in the pixel pumping resolution of 1600x1200, where the sheer bandwidth of the Radeon helps it to nudge ahead of the GeForce 2 GTS.

Another important thing to observe is the Evolva scores when bump-mapping was enabled. Here, the Radeon won
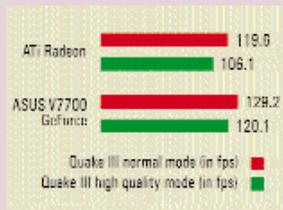
by quite a decent margin. But its 3DMark score was a little disappointing and the GeForce2 GTS emerged the clear winner in this synthetic test.

Overclocking the card was pretty simple as PowerStrip detected both the memory and core timings. Running the core at stock (183 MHz) and the memory at 210 MHz, a total performance gain of around 15 per cent was achieved. The card was stable and no artifacting was observed. More importantly, very little gain was observed when the core was over-clocked to 190 MHz.

introduced by nVidia. It basically offloads work from the CPU by doing all the intensive floating point calculations while generating a 3D environment, including all the dynamic light sources and shadows. ATi has upped the ante here. Its integrated T&L can theoretically manage 30 million triangles per second whereas the GeForce 2 GTS tops out at 25 million triangles per second. Though it may seem trifle, it does indicate that here's a product that can beat the GeForce 2 GTS, at least in theory.

The Radeon also features the acclaimed Environment Mapped Bump Mapping (EMBM). This technique is best suited for re-creating glossy, shiny or reflective surfaces, for example waves on water. DOT Product 3 and Cube Environment Bump Mapping that GeForce's line of cards bank on, are considered poorer cousins of EMBM.

Mad about Hyper Z

The most talked about feature among all these is the 'Hyper Z' technology. Not only does it propose a revolutionary method of 3D rendering, it also seems to be the only solution when it comes to saving rendering power as 3D scenes and environments become larger and more complicated.

To understand why Hyper Z is hot, you first need to understand how pixels are rendered. Each pixel that needs to be rendered gets its z-coordinate stored in the z-buffer. This is done so
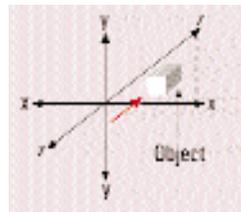
The z axis denotes the depth at which a pixel is rendered. The red arrow indicates the angle at which the observer will view it. Since he cannot see the grey and black surface of the object, these are not drawn

that the rendering unit can find out if the pixel needs to be rendered in the same spot, in front of or behind some other pixel. Once the pixel is rendered, the z-coordinate of a new pixel gets stored in the z-buffer. The problem occurs when a later triangle happens to cover a pixel that was earlier rendered. The earlier pixel is overwritten and this means it was drawn and rendered in vain. Thus, the rendering engine has wasted one clock cycle for that pixel. Now imagine millions of such triangles in a scene and you can understand the total extra engine time, bandwidth and memory consumed for rendering unnecessary pixels.

To battle with this unnecessary pixel rendering, ATi has put into action three snazzy features—the Hierarchical-Z, Z-Compression and

Fast Z-Clear. Together, they make sure whether each pixel that is sent from the triangle setup to the rendering unit is visible to the frame or not. If it isn't, it is not rendered at all. Fast Z-Clear is also able to clear the z-buffer more than 50 times faster than normal, thus saving time and memory bandwidth. Right now, Hyper Z offers a marginal improvement of about 10-15 per cent over a graphics card without this feature. But once all the features have the proper driver and game developer support, the total improvement could be anywhere between 30 to 40 per cent.

At the heart of the matter

The core chip is based on the Rage6C core featuring the Charisma Engine and Pixel Tapestry architecture. The core clock is rated at 183 MHz and it had 64 MB of DDR RAM, running at 183 MHz (5.5 ns). Very few games would require such high amount of RAM unless you play at resolutions higher than 1024x768. Do note that the 32 MB-version of this card has somewhat lower specifications. Here, the core and memory run at 166 MHz and hence performance will be a tad bit lower too. Did you mutter, "Double standards!" under your breath? Certainly seems like it. Obviously, the 64 MB version would be more expensive and would sell less. Hence, by upping its core and memory speeds, ATi is offering an 'ultra' but you have to shell out extra dough for the 64 MB of onboard RAM.

All said and done

Not only is the Radeon a worthy competitor to the GeForce and the GeForce2 series of cards from nVidia, it actually beats them feature for feature. That is not to say that there is no room for improvement. Better drivers as well as games optimised towards these features will definitely give a performance boost that would close in on the gap between Radeon and GeForce 2 GTS. When and whether this happens is a different story, since ATi is known to be a bit lazy with driver updates and patches. Also, with the latest driver 4.12.3056 that was used, there were problems with games running in 16-bit mode. But considering that you get a 64 MB Radeon (Rs 24,500 approx) for less than the cost of a 32 MB GeForce 2 GTS (Rs 29,400 approx), coupled with all the frills, it surely makes a great buy.

The benchmarks clearly show that ATi still has some way to go before it can even contemplate dethroning nVidia, especially as nVidia already has the speed-demon GeForce 2 ULTRA out and plans to release the GeForce 3 (NV20) very soon. ATi too is planning to release a much-revised Radeon, called the Radeon 2, which will be squarely positioned against the GeForce 3. For now, ATi's effort to provide an alternative to the nVidia bandwagon surely bodes well for the frame-hungry consumer! ❖

BENCHMARKING RESULTS		
Tests	ATi Radeon	ASUS V7700 GeForce 2 GTS
Evolve non-bumpmapped (in fps)	87.8	101.1
Evolva bumpmapped (in fps)	54.6	49.6
3DMarks	5036	6468
CPU 3DMarks	432	462

HARDWARE

Radar

The best of graphics cards, the Cyrix processor with a difference, motherboard and CD-writers

HP Invent 8230e

No new inventions

This good-looking, external CD-RW sports a fast USB interface, but performed like any other normal IDE drive. The drive took 18.43 minutes to write 650 MB on to a CD-R, and just a few seconds more to write to a CD-RW. It took 39.46 minutes to erase the same data, which is the average time taken in most drives.

SPECIFICATIONS:
Speed: 4x read, 4x write, 6x multi-read speed
Interface: USB
Accessories: Power cable, USB cable and audio cable
Bundled software: Installation disk and CD, Corel Print Office 2000, MusicMatch Jukebox, HP CD-labeler and jewel case software
Benchmarks: Writing 650 MB to CD-RW—18.56 minutes

verdict	B +
HP Invent 8230e	
Performance	
Build Quality	
Value for Money	
Features	
OVERALL	

+ Solid and good looking
+ Not expensive
+ Good software included
- Average performance for USB interface
Contact: Hewlett-Packard (India)
Phone: 011-6826000
Fax: 011-6826030
E-mail: kaushik_bellani@hp.com
Web site: www.hp-india.com
Price: Rs 17,200

Sony CRX 160E-H1

Erases before you blink

This CD-RW gave some amazing results while erasing data from a CD-RW media. It took just 7 seconds to erase 650 MB of data. We tested it again just to make sure and got the same result. The only unfortunate part is that this drive isn't detected by Nero, the popular and widely-used software for burning CDs.

SPECIFICATIONS:
Speed: 32x read, 12x write, 8x re-write
Interface: IDE
Accessories: Audio and data cable, detailed manual, one CD-R (8x) and one CD-RW media
Bundled software: CD-Maker 2000 and software for burning CDs
Benchmarks: Writing 650 MB to CD-R—23.10 minutes Writing 650 MB to CD-RW—25.23 minutes Erasing 650 MB from CD-RW—7 seconds

verdict	B +
Sony CRX 160E-H1	
Performance	
Build Quality	
Value for Money	
Features	
OVERALL	

+ Fast erasing speed
- Doesn't work with Nero
Contact: Mega Networks
Phone: 022-5296932/33
Fax: 022-5220770
E-mail: sales@meganet1.com
Web site: www.meganet1.com
Price: Rs 18,000

Samuel (Cyrix III) processor

The Internet processor

The new Cyrix III, also known as Samuel, is a low power consuming processor, making it ideal for handheld or Internet-based devices. The 667 MHz processor that we tested did well in the benchmarks, though it didn't do too well in the gaming tests. The absence of the L2 cache makes it ideal for devices needing low power.
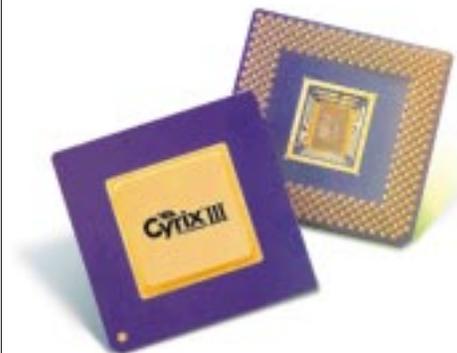
SPECIFICATIONS:
0.18 micron, 128 KB L1 cache, 64 KB unified write-back cache, optimised for both 16- and 32-bit code, Socket 370 compatible with Socket 7
Processor speed: 500 MHz to 667 MHz
FSB: 133 MHz
Benchmarks: 21.4 in Business Winstone (impressive) 2810 in Disk Winbench99 (good) 22.2 fps in Quake III (not impressive)

verdict	B +
Samuel (Cyrix III) processor	
Performance	
Build Quality	
Value for Money	
Features	
OVERALL	

+ Low power consumption
+ Socket 370 fits in all motherboards
- Lack of L2 cache hampers performance
Contact: Karma Distribution
Phone: 011-6420450/1
Fax: 011-6420452
E-mail: cyrixsales@karmasg.com
Price: Rs 3,600

Colourful scans

The Acer 640BU sports a USB interface and wasn't detected automatically. The scanner has three operating buttons and the functions vary depending on how long you hold down the button and the amount of pressure you apply. It did well in detecting the colours, but the highlights and shadows weren't detected properly. Its scanning speed was comparatively fast.

Acer 640BU Scanner

SPECIFICATIONS:
Interface: USB
Bundled software: Fine Reader, Presto Page Manager, Copier and Scan Button
Scan resolution: 600x1200 dpi
Scanning Area: 8.5x11.7 inch
Colour depth: 48-bit
Time taken to scan a 10x8-inch photo: 45.82 seconds

verdict	B +
Acer 640BU Scanner	
Performance	
Build Quality	
Value for Money	
Features	
OVERALL	

+ Good colour results
- Not good for scanning low contrast images
Contact: Acer Peripherals
Phone: 022-5705230 Fax: 022-5705235
E-mail: apilsales@netkracker.com
Price: Rs 5,800 + taxes

Watch and work

Matrox's G450 is a unique 2D graphics card with Dual-Head Technology (capability to support two monitors). You can also have the output on either monitors, or do different tasks such as watch a movie on one monitor while working on the other. Its performance was more or less comparable to the TNT2 class graphics cards.

Matrox G450
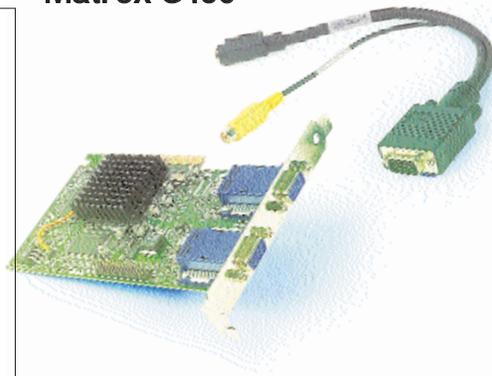
SPECIFICATIONS:
16 MB video memory, good bundled drivers
Benchmarks: 977 and 2355 in 3DMarks with DualHead display enabled and disabled, respectively.
72.8 fps in *Quake III* normal mode and 36.2 fps in high quality mode.

verdict	B +
Matrox G450	
Performance	
Build Quality	
Value for Money	
Features	
OVERALL	

+ Good value for money
+ Good features
- Not for gamers
Contact: Neoteric Informatique
Phone: 022-4172600
E-mail: sales@neoteric-info.com
Price: Rs 9,200

Inexpensive board

The JETWAY 618AF, built around the 815e chipset, features all the extra frills, performance and stability that you get from the ASUS and Intel boards, though jumpers need to be set for the 133 MHz FSB setting. The benchmarks as far as gaming and other applications are concerned, were pretty much the same as compared to other 815e-based boards.

JETWAY 618AF (815E)
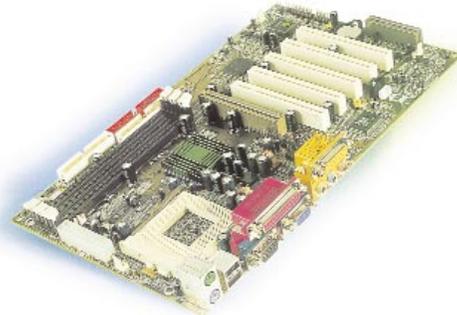
SPECIFICATIONS:
Supports Socket 370 processor
Intel 82815E and 82801BA (ICH2) chipset (supports ATA-100)
Onboard graphic accelerator
Supports 4x AGP
Onboard audio
Benchmark:
32.7 in Content Creation Winstone
129.2 fps in *Quake III* normal mode

verdict	A -
JETWAY 618AF (815e)	
Performance	
Build Quality	
Value for Money	
Features	
OVERALL	

+ Cheaper option compared to other brands
Contact: Rashi Peripherals
Phone: 022-8260258
E-mail: ho@rptechindia.com
Price: Rs 6,900

Gamers' choice

The GeForce2 board format is very similar to the nVidia reference design and uses almost the same specification of RAM too. It gave blazing frame rates. Moreover, the transition to 32-bit from 16-bit too did not bring a major performance hit. This card did not feature the VIVO module. The card is recommended only for hardcore gamers and enthusiasts.

ASUS V7700 GeForce2 GTS

SPECIFICATIONS:
RAM: 32 MB DDR
Benchmarks:
87.4 fps in *Quake III* (1024x768 at 32-bit), 32.9 fps at 1600x1200 resolution

verdict	A -
ASUS V7700 GeForce2 GTS	
Performance	
Build Quality	
Value for Money	
Features	
OVERALL	

+ Blazingly fast
+ Best card for Quakers
- Very expensive
Contact: Rashi Peripherals
Phone: 022-8260258
E-mail: ho@rptechindia.com
Price: Rs 29,400

Radar

Software utilities for the Internet, the latest version of Eudora, audio-video software and other cool stuff

Find Fast

Advance Cataloger is a database management tool that catalogues the directory structures of all the storage media. Files and folders are arranged as per categories with additional comments and keywords also added. This helps in faster location of the file. You can also restrict access to the catalogue or use a filter to select the files to be catalogued.

Advance Cataloger
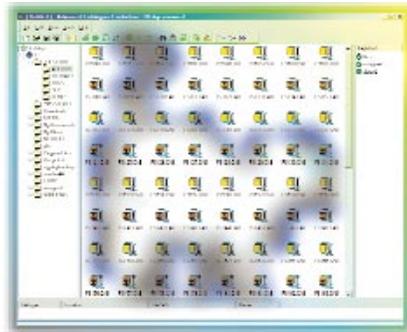
SPECIFICATIONS:
Can extract information from audio CDs, executables, dll files, etc.
Can delete files and folder from catalogue
Interface: Look and feel of Windows Explorer

verdict	B
Advance Cataloger	
Ease of use	
Features	
Performance	
Value for Money	
OVERALL	

+ Customisable
+ Faster searches through keywords
- Crashed Windows while working
Developer: ACat
Web site: http://acat.hypermart.net
Price: Shareware

Express yourself

This icon-editing tool makes life easier when working with icons, allowing for the creation and management of multiple icons and icon libraries at the same time. The software comes with icon extraction and locating tools. Unwanted icons can be easily deleted from the icon libraries. You can also drag and drop images from one library to another.

Articons
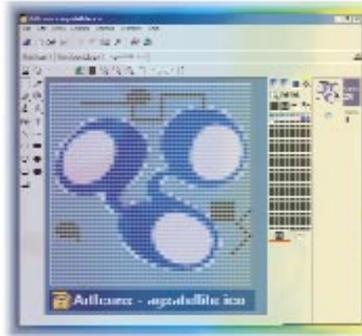
SPECIFICATIONS:
Install size: 620 KB
Interface: Good-looking and colourful, 16 million colour depth and support for standard- as well as custom-size icons

verdict	A -
Articons	
Ease of use	
Features	
Performance	
Value for Money	
OVERALL	

+ Cool interface
+ Easy to use
- Restricted icon search in trial version
Developer: Aha-Soft
Web site: www.aha-soft.com
Price: Shareware

Rock and roll

MP3 Liquid Burn is a multi-utility audio-based software. It's an MP3 player, MP3 to Wav converter, CD burner and lots more. This feature-rich software takes some time to get used to as it is heavily loaded. But once you get the hang of it, just click the first button on the main bar, import the song and sit back to hear the melodious tunes.

MP3 Liquid Burn
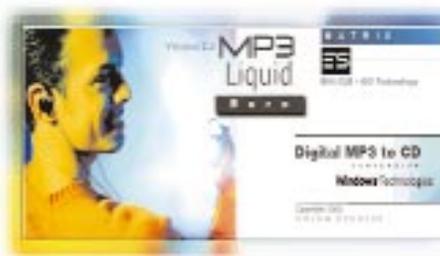
SPECIFICATIONS:
Bar graph and line graph equaliser options
Can rip audio tracks
Option of printing CD cover

verdict	B +
MP3 Liquid Burn	
Ease of use	
Features	
Performance	
Value for Money	
OVERALL	

+ Cool looking interface
+ Feature rich
- Takes time to get used to
- Only five tracks can be ripped in the shareware version
Developer: Orion studio
Web site: www.orionstudios.com
Price: Shareware

Conquercam

This shareware lets you publish images to your Web page without any hassles. The images captured from the Webcam can be uploaded automatically to the FTP sites at predefined intervals. The image grabbed can also be adjusted for quality of the captions. The program starts automatically when Windows boots up, and maintains a list of the FTP sites.

SPECIFICATIONS:
Install size: 2.69 MB
Overlay option for image-editing
One-click accessibility buttons in the system tray

verdict	B +
Conquercam	
Ease of use	
Features	
Performance	
Value for Money	
OVERALL	

+ Windows Explorer kind of interface
+ Can use it for free by clicking on the advertiser
- Takes some time to get used to
Developer: Conquerware
Web site: www.conquercam.com
Price: Shareware

Webtrends Log Analyzer

If you want to know the number of hits you receive on your site, then the Webtrends Log Analyzer is for you. It gives the complete report of number of hits, along with information like where they are coming from in terms of location and site and also their area of interest. It also has an in-built filtering mechanism to zero in on the data you want.
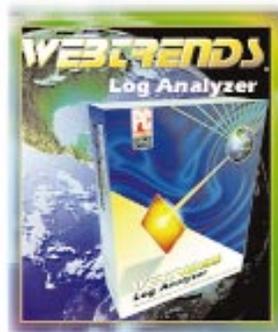
SPECIFICATIONS:
System requirements: 486 and above, 100 MB hard disk, 128 MB RAM, Win 9x/NT/2000

verdict	B +
Webtrends Log Analyzer	
Ease of use	
Features	
Performance	
Value for Money	
OVERALL	

+ Filtering option
+ Can change interface and fonts
Contact: Summit Infotech
Phone: 011-6517994
Developer: Webtrends Corporation
Web site: www.webtrends.com
Price: Rs 34,950

Simply Accounting 8.0

This well-designed accounting software gives you many options of designing reports using the Crystal Report Write. It has all the necessary modules such as accounting, inventory, payroll, etc. Right from the report level it can take the user back to the entry level for updating. It also bundles with a currency conversion utility for foreign exchange transactions.

SPECIFICATIONS:
Space taken: 72 MB
Minimum hardware: Pentium 166, 16 MB RAM
OS Support: Windows 9x, Win NT

verdict	B+
Simply Accounting 8.0	
Ease of use	
Features	
Performance	
Value for Money	
OVERALL	

+ Feature-packed
+ Currency converter
Contact: Simplysoft Technologies
Phone: 080-2384900
Fax: 080-2384905
E-mail: enquiry@simplysofttect.com
Price: Rs 5,990

Eudora 5.0.2

Qualcomm is back with its newest iteration of one of the most popular e-mail clients—Eudora. Among the major upgrades are features such as Eudora Sharing Protocol (ESP) that allows users to chat and share documents in a workgroup; MoodWatch, that allows the user to filter out offensive language in e-mail and e-mail statistics.

SPECIFICATIONS:
Download size: 6.03 MB
Features: Filtering of offensive language, allows sharing and chatting among workgroups, logging of e-mail usage with statistics

verdict	A -
Eudora 5.0.2	
Ease of use	
Features	
Performance	
Value for Money	
OVERALL	

+ Greater functionality
- Has a rather cumbersome upgrade process
Developer: Qualcomm
Web site: www.eudora.com
Price: Shareware

Reviews

## The Business of E-Commerce

E-commerce has taken business to a completely different level. But before you make the Net your playing field, you need to know about the various issues pertaining to conducting your business online. This book targets businessmen and technology decision-makers with a view to help them understand relevant technologies and applications. So if you are planning to conduct your business on the Web, leaf through to make things easier for yourself.

Publisher: Cambridge University Press
Phone: 022-7709172
Fax: 022-7709173
E-mail: cupmum@cupind.com
Web site: www.cambridge.org
Price: Rs 280
Rating: ♟♟♟♟

The IT Professional's Guide to Managing Systems, Vendors...

A useful reference for any person in IT, this book covers topics that are usually ignored in technical training classes. It provides an insight into various network-related topics and other useful subjects such as on how to attain the best possible support from your hardware and software vendors. A major highlight of the book is the section Exploring IT Skills, which discusses the various avenues available for obtaining IT-related skills.

Publisher: Tata McGraw-Hill
Contact: Computer Book-shop
Phone: 022-2070989
E-mail: cbsbom@giasbm01.vsnl.net.in
Price: Rs 350
Rating: ♟♟♟♟

Chicken Run

Did you see the animated movie about a gang of enterprising chickens who were hell-bent on getting out of their farm? Welcome to Chicken Run, the game and also your chance to be a chicken! This game version is based on the movie and essentially involves solving puzzles. The graphics are decent and there are some cool camera angles. But figuring out the goals can be a bit tedious. However, if you enjoy strategy games, check out this one.

Developer: Eidos
Contact: Milestone Interactive
Phone: 022-8381614
Price: Rs 999
Rating: ♟♟♟

On the Stands

e-Enterprise
Clearly targetting the corporate user, this book seeks to provide a recipe for developing and maintaining highly scalable e-systems. Contains topics related to business models, architecture and components.
Publisher: Cambridge University Press **Price:** Rs 250
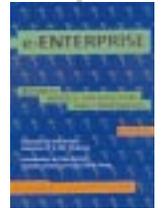
Linux Network Administrators Guide
This book hinges on helping Linux users setting up and managing a Linux network configuration. It also includes information on some of the networking software that comes with the operating system. It includes chapters on topics such as introduction to TCP/IP, configuring network, etc.
**Publisher:** O'Reilly
Contact: Computer Bookshop **Price:** Rs 350
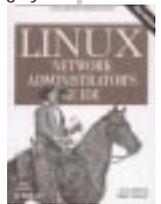
Webster's New World Dictionary
Do you feel like a klutz every time your software engineer friend starts spouting terms such as 'areal density' or 'open systems protocol'? Help is at hand. Reach out for this book and educate yourself about the latest computer jargon. Then make others sweat for a change while you throw some of these around!
Publisher: IDG Books
Phone: 011-3260877
E-mail: idgbooks@vsnl.com
Price: Rs 129

A-List

A listing of the best products in different hardware and software categories

Who's in, who's out? The competition's hot, but only the winners get to this page—a listing of the best performing hardware and software that have been tested till date in different categories.

Every month, at the Digital Media Test & Research Center, we carry out a series of comparison tests as well as individual product reviews. Based on these tests, the best products have been listed here (*detailed reviews on CHIP CD-Mindware*). As different products get reviewed over the months, the top products might find themselves slipping out of the charts and replaced by the latest entrants in the market. So, keep your ears sharp and eyes open and keep yourself abreast of the latest cool products.

HARDWARE

Monitors (14- & 15-inch)
Sony CPD-E100
+ Very good features and performance
- High priced
Contact: Rashi Peripherals
Phone: 022-8260258
Fax: 022-8190766
Price: Rs 15,300

Monitors (17-inch)
ViewSonic PS775
+ Very good image quality
+ Support for high resolution
Contact: Roop Electronics
Phone: 022-6175213
Fax: 022-6103919
Price: Rs 32,000

Monitors(19- & 21-inch)
Sony CPD-G500
+ Truly flat 21-inch screen; support for nearly every type of image
- Very expensive

Contact: Rashi Peripherals
Phone: 022-8260258
Fax: 022-8190766
Price: Rs 87,250

3D Graphics cards
ASUS GeForce2 GTS 32 MB DDR
+ Blazingly fast
+ Best for gamers
- Very expensive
Contact: Rashi Peripherals
Phone: 022-8260258
Fax: 022-8190766
Price: Rs 29,400

Speakers
Creative SoundWorks DTT2500
+ True Dolby Digital-compliant sound
- Very expensive
Contact: Compuage Infocom
Phone: 022-4913986
Fax: 022-4919069
Price: Rs 27,500

Soundcards
SoundBlaster Live! Platinum 5.1
+ Dolby Digital AC-3 compliant
+ Very high quality sound processing
- Expensive
Contact: Compuage Infocom
Phone: 022-4913986

Fax: 022-4919069
Price: Rs 14,500

Motherboards
ASUS A7V
+ Very stable and feature packed
- Rather expensive
Contact: Rashi Peripherals
Phone: 022-8260258
Fax: 022-8190766
Price: Rs 15,000

Processors
Pentium 4—1.4 GHz
+ Fastest processor availablein India

- Rather expensive
Contact: Ockam Systems
Phone: 022-6234798
Fax: 022-6704503
Price: Rs 85,000 (entire kit)

Hard disks (IDE)
IBM Deskstar 75GXP DTLA-307075 - 75GB
+ 10,000 RPM; good data transfer
+ 1 MB buffer
- Rather expensive
Contact: Wales Technologies
Phone: 022-3828100
Fax: 022-3828200
Price: Rs 32,000

Hard disks (SCSI)
Seagate Cheetah 18XL - ST318404LW - 18GB
+ The fastest hard disk available
- Very expensive
Contact: ACI
Phone: 022-8595830
Fax: 022-8595831
Price: Rs 24,500

CD drives
ASUS CD-S500
+ Very good performance
- Rather expensive
Contact: Rashi Peripherals
Phone: 022-8260258
Fax: 022-8190766
Price: Rs 3,600

DVD drives
Pioneer DVD-105SZ
+ 16x DVD speeds
+ Very good build quality
- Cannot retract the CD without power
Contact: Integra Micro Systems
Phone: 022-8215179
Fax: 022-8231461
Price: Rs 8,000

CD-RW drives
Plextor W1210TA
+ Very high write and rewrite speeds; 2 MB buffer
- Very expensive
Contact: Zeta Technologies
Phone: 022-4102277
Fax: 022-4102277
Price: Rs 14,950

External Storage Devices
IOMEGA 2GB Jaz
+ Very good price per MB; hard-disk-class performance
- Not compatible with floppies
Contact: Neoteric Infomatique
Phone: 022-4172600
Fax: 022-4163679
Price: Rs 19,000

Inkjet Printers
HP Deskjet 930C
+ High print resolution of 2400 dpi
+ Capable of printing on both sides
Contact: Hewlett-Packard
Phone: 011-6826000

Fax: 011-6826030
Price: Rs 11,000

Laser Printers
Samsung ML-5200A
+ Good text printing with effortless USB connectivity
- Average print speeds
Contact: Samsung
Phone: 011-6932517
Fax: 011-6932607
Price: Rs 25,500

Scanners
Microtek ScanMaker 4
+ Good scan quality
+ High speed, dual-bay capability
Contact: Compuage Infocom
Phone: 4913986
Fax: 4919069
Price: Rs 56,000

PCs
The Best ASUS Coppermine 700E
+ Very good choice of components
- Rather tinny speakers provided
Contact: The Best
Phone: 022-8235360
Fax: 022-8375458
Price: Rs 87,250

Laptops
Zenith 21A
+ Feature packed
+ Lots of manuals
Contact: Zenith
Phone: 022-8377300
Fax: 022-8364859
Price: Rs 125,000

Handhelds
HP Jornada 680E
+ Power 133 MHz processor
+ Colour screen
Contact: Hewlett-Packard
Phone: 011-6826000
Fax: 011-6826030
Price: Rs 53,880

MP3 players
Creative NOMAD Jukebox
+ Excellent sound quality; onboard audio processing; USB interface
- Very expensive; has moving parts
Contact: Compuage Infocom
Phone: 022-4913986
Fax: 022-4919069
Price: Rs 34,000

Digital cameras
ClickiT! DCE-400
+ Good picture quality
+ Effortless connectivity
Contact: Memphis Technology
Phone: 022-8523439
Fax: 022-8523460
Price: Rs 19,999

Keyboards
ACER Ergo
+ Ergonomic design
- Rather expensive
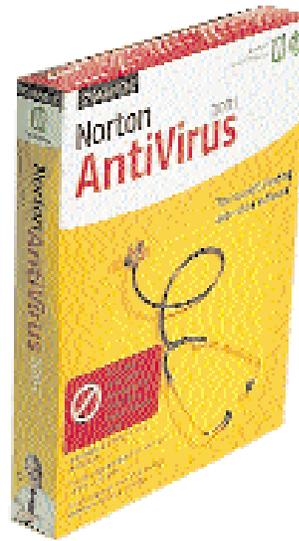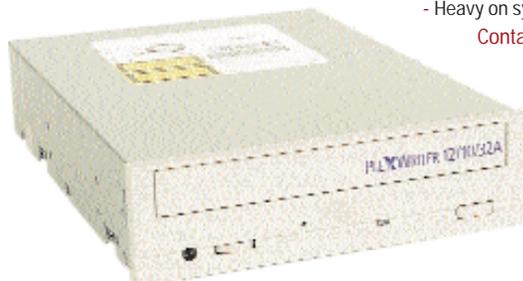
Contact: Acer Peripherals
Phone: 5705230
Fax: 4705235
Price: Rs 4,000

Gaming peripherals
Microsoft SideWinder Force Feedback Pro
+ Highly customisable
- Expensive
Contact: Mnemonic Systems
Phone: 8010871
Fax: 8051761
Price: Rs 8,950

Pointing devices
Microsoft Intellimouse Eye
+ Very smooth; resilient to dirt
- Rather expensive
Contact: Microsoft Corporation
Phone: 022-2850193
Fax: 022-2850198
Price: Rs 3,900

SOFTWARE
Operating systems (Linux)
SuSE Linux 7.0
+ Simple to install
+ Many bundled applications
Contact: G. T. Enterprises
Phone: 080-6606093
Fax: 080-6671407
Price: Rs 1,800

Operating systems (Windows)
Windows 2000 Professional
+ Very stable
- Heavy on system requirements
Contact: Integrated Business Solutions
Phone: 022-6791297
Fax: 022-6791297
Price: Rs 8,450

Page layout
Corel Ventura 8
+ Many bundled features and tools
Contact: Integrated Business Solutions
Phone: 022-6791297
Fax: 022-6791297
Price: Rs 38,000

Web authoring
Macromedia Dreamweaver 4.4.0
+ Extensive feature support
Contact: Integrated Business Solutions
Phone: 022-6791297
Fax: 022-6791297
Price: Rs 13,500

Anti-virus
Norton Antivirus 2001
+ Very good virus-detection ratio
+ Simple updates
- Resource hungry
Contact: Tech Pacific
Phone: 5960101
Fax: 5960263
Price: Rs 1,450

Office suites
Microsoft Office 2000
+ Tight integration with Web
+ Extensive feature support
Contact: ntegrated Business Solutions
Phone: 022-6791297
Fax: 022-6791297
Price: Rs 14,200 (Std);
Rs 17,000 (Prof)

Firewalls
Norton Personal Firewall 2000
+ Comprehensive features and capabilities
- Rather daunting interface for novice users
Contact: Tech Pacific
Phone: 5960101
Fax: 5960263
Price: Rs 2,200

Voice recognition
Dragon NaturallySpeaking v5.0 (Preferred Edition)
+ Impressive speech recognition
- High on system requirements
Contact: HCL Infosystems
Phone: 011-4526518
Fax: 011-4526579
Price: Rs 17,995

UNDERCOVER
On the RAM Trail

Rushing out to buy some memory? Glean some valuable lessons from Agent 001's (mis)adventures in the market

D o you need more RAM? That's like asking, do you need more money? Of course you do! System memory is an important cog in the processing wheel of the PC. The quantity and quality of RAM you have inside your PC decides the speed at which your games and applications run, how often your computer hangs and whether it runs the new OS you installed without crashing. In short, bad things happen if you have the wrong kind of RAM.

My hunt for the right RAM took me to Mumbai and Delhi. The first dealer I spoke to told me that the latest in the market was this fast RAM called PC100 with 100 MHz speed. I asked him, "Anything faster than that?" "Not available," was the reply. When I asked him whether he meant not available in India, or not available at his shop, he looked quite irritated. "Do you want to buy or are you here for time pass?" I told him I wanted to buy, but only the latest, at which he flatly told me that they were out of stock. He refused to even give me the prices.

The second dealer was more helpful. He told me that there were two versions of RAM available—PC100 and the PC133. He mentioned that the newer version of PC133 RAM wouldn't work on older motherboards. Another dealer told me about a variety called dual RAM that would work on both older and newer motherboards. He advised me to always check for compatibility with the motherboard and the processor when choosing RAM. "If your processor has an FSB (front side bus) of 133 MHz, then only the PC133 will work. Otherwise go for a PC100."

Yet another dealer told me that PC133 RAM was selling like hotcakes. When he showed me the memory module, I asked in my best ignoramus tone, "What's so special about this? It looks just like an old one I saw in my friend's computer." He showed me the sticker on it, insisting that this was the latest arrival in the market. But couldn't that sticker have been put there by just about anyone? Was there any other proof? The guy could offer me none.

Most of the other dealers I talked to said that it was not possible to differentiate between a PC100 and PC133 RAM from their physical appearance, and that was why these memory modules came with a special sticker that mentioned the specification.

I was particularly impressed with one Mumbai man who explained at great lengths how I could use the number on the sticker to check the chip maker's Web site for complete information on the chip. He diligently answered most of my questions. Of course, I stumped him with, "What is the difference between CAS3 and CAS2 latency?" After all, I ain't Agent 001 for nothing. ;)

One thing I noticed was that many Delhi vendors pressed me to choose RAM made by local manufacturers like Simtronics, and discouraged me from buying branded RAM like Hyundai or Compaq, which is more expensive. Unless, of course, it has come in through the flourishing grey market.

Grey market dealers can be blissfully ignorant about the type of RAM they have on offer. Take the case of this dealer I chanced upon in Andheri East, Mumbai. He offered me for Rs 2,500 what he assumed to be regular 64 MB RAM from Hyundai; while in reality it was 128-MB ECC RAM (used in high-end PCs and file-servers) from Transcend, worth anywhere between Rs 12,000-16,000! ❖

> "Always check for compatibility with the motherboard and the processor when choosing RAM"

The real deal

Of the two types of RAM, SDRAM is significantly cheaper and is suited for P-II, P-III, Coppermine, Celeron, Duron or Athlon-based systems. RDRAM is used with processors such as the new Pentium 4 and is sold as part of the Pentium 4 package.

SDRAM is available in PC100 (100 MHz) and PC133 (133 MHz) speeds. Using PC100 RAM in a 133 MHz board might cause

PC100 modules, which support the 100 MHz systems, are generally rated at 8 ns. Similarly, PC133 supports the 133 MHz system bus in the new Coppermines.

CAS3 vs CAS2 latency
Latency is the time (number of clock cycles) taken by the system to access the first bit of data stored in RAM. CAS3 RAM takes three

Coppermine 733+ and 700; Celeron	i815E/i810E chipset	64 MB/CAS2 PC100 SDRAM
Pentium 4	i850	128 MB/PC100 RDRAM
AMD Athlon and Duron	VIA KT 133/KX 133	64 MB/ PC 133 SDRAM

problems, but PC133 RAM works fine in 100 or 66 MHz boards.

According to the Intel specification,

clock cycles, while CAS2 RAM needs just two clock cycles. Go for CAS2, especially when buying fast RAM like PC133 SDRAM.