



# The young pretenders

Fancy a processor with performance to rival the Pentium III, yet at a fraction of the price? AMD's new CPU may be just what you need. We test ten budget-priced PCs with the K6-III inside.

When AMD's 233MHz K6 CPU debuted two years ago, it was touted as a 'Pentium killer'. But in spite of its strengths, the K6 failed to topple Intel's processors from their dominant position. AMD's next-generation CPU, the K6-2, was launched last year. With its 3D Now! instructions, the K6-2 proved to be a match for the Pentium II in both integer and floating point operations. Its low price made it a viable alternative to Intel's processors in the budget PC market, and the success of the K6-2 may have been a contributing factor in Intel's decision to launch its low-cost Celeron processors.

**AMD's latest release, the K6-III CPU,** is pitched squarely against Intel's new Pentium III in terms of processing power. However, it remains, like the Celeron, a budget processor which will appeal to buyers who do not want to pay premium prices for the PIII, yet want something *more* than a Celeron.

Here, we review ten K6-III systems, comparing their performance to Intel's Pentium III. To provide a level playing field for all manufacturers, we asked for 400MHz processors, 128Mb of RAM, at least an 8Gb hard drive and a 17in monitor. We set a price point of £999 (ex VAT). The choice of the remaining components and software was left up to the manufacturers themselves.

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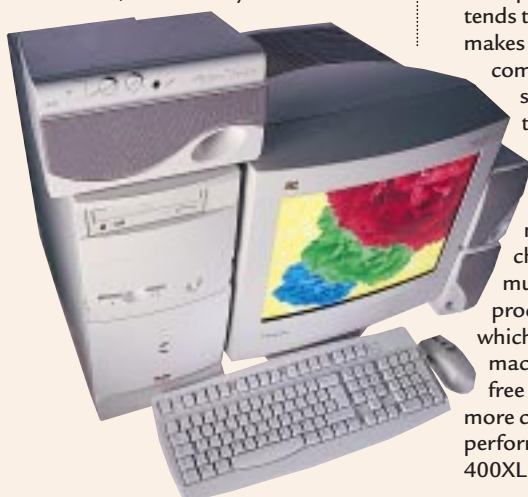
• PCs tested and reviewed by Ajith Ram

## Ratings

- ★★★★★ Highly recommended
- ★★★★ Great buy
- ★★★ Good buy
- ★★ Shop around
- ★ Not recommended

## Big Red Voyager 3 400XL

The most impressive aspect of this Big Red PC is its build quality. Like the Performance K400 from New Century Computers [p138], the Seagate hard drive in this system is located vertically just beside the power supply. This leaves an extra 3.5in bay free at the front of the case. The motherboard is located well away from the power supply unit. All the components, including the CPU, are instantly accessible



and none of them are blocked by drives or the power supply. The software configuration appeared to be excellent. The Diamond Viper V550 graphics card uses the Riva TNT chipset. Although not quite as powerful as the Voodoo3 2000, it has more advanced features such as anisotropic filtering, which gives better image quality. However, it still lacks hardware support for DVD playback. The TNT chipset tends to run extremely hot so it makes sense to keep the other components a couple of slots away from it. And this is exactly what Big Red has done. Upgradeability isn't a problem. The Gigabyte motherboard with the ALi chipset has a six-times multiplier, so it can take faster processors, up to 600MHz, which will lengthen the life of the machine. There are also plenty of free slots available for adding more components. Overall performance of the Voyager 3 400XL is below that of most of the

PCs featured here, but this could be due to a slightly slower hard drive.

The Viewsonic GT775 is an aperture grille monitor with a diagonal dot pitch of 0.25mm. It has some of the most intuitive controls, with on-screen displays. Image quality is good, with wide colour range and no misconvergence.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Big Red 08700 711117  
[www.bigred.co.uk](http://www.bigred.co.uk)

**Good Points** Excellent build quality. Good monitor.

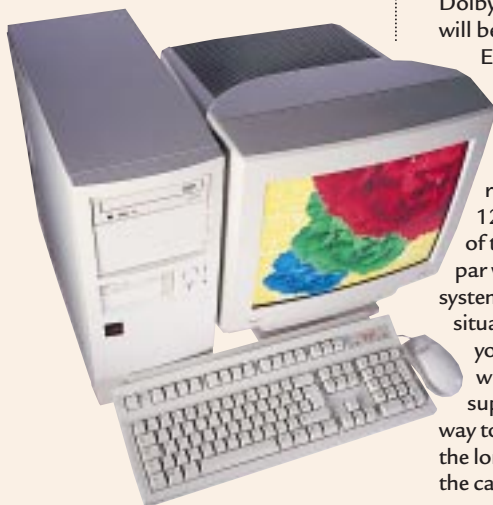
**Bad Points** Average performance.

**Conclusion** A well-built PC.

<b>Build Quality</b>	★★★★★
<b>Performance</b>	★★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★

## Carrera Sirius M400

The Sirius M400 has an Asus motherboard which uses the Aladdin chipset. The K6-III has a front-side bus speed of 100MHz, the same as that of the Pentium III, but faster than the 66MHz front-side bus speed of the current Celerons. 3Dfx's Voodoo3 2000 graphics card takes up the solitary AGP slot, and although it is immensely powerful, it lacks the



advanced features of ATI's Rage Fury. One of these is hardware support for DVD playback, so the processor alone will have to handle all MPEG decoding. The SoundBlaster Live! Value is an OEM success story but another sound card is sniping at its heels: Carrera has included the Vortex2 from Aureal Semiconductors. Unlike the Live!, the Vortex2 has support for Dolby Digital decoding. Gamers will be delighted by its support for EAX and A3D APIs, which enhance games performance.

Instead of the standard floppy drive, Carrera has opted for an LS-120, which reads ordinary floppies and 120Mb disks. The build quality of the Carrera system is not on a par with the best. Like the Time system, the power supply unit is situated directly over the CPU so you won't be able to remove this without first removing the power supply unit. Therefore, the only way to access the latter is to remove the lone DIMM module. Fortunately, the case itself is well ventilated, and

there are enough PCI slots and bays free for easy upgrading.

The Iiyama S702GT is a shadow mask monitor with a viewable area of 15.7in. Our DisplayMate tests didn't reveal any glaring problems, but as shadow mask isn't as bright or as sharp as the Sony Trinitron MultiScan 210ES, it does run it a close second.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Carrera 0181 307 2800  
[www.carrera.co.uk](http://www.carrera.co.uk)

**Good Points** Powerful sound card. LS-120 drive.

**Bad Points** No hardware MPEG decoding. Power supply obstructs CPU.

**Conclusion** A fast PC for games.

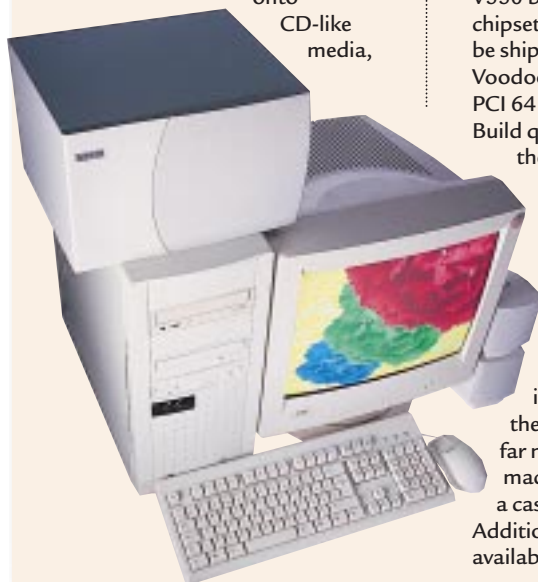
<b>Build Quality</b>	★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★★



## CyberMax DareDevil

**This is probably the best specified system** in this group test, particularly on the hardware front. Time included a CD-R in its PC [p140] but CyberMax has gone one step further by including both a Sony CD-RW and a Toshiba DVD drive. The CD-RW lets you rewrite data

onto  
CD-like  
media,



but some drives have a problem reading CD-R media written on another machine. However, the DVD drive should be able to read these other disks. Also included is a massive 11.5Gb Maxtor hard drive, the largest in this group test. The graphics card is the Diamond Viper V550 based on the Riva TNT chipset, although the DareDevil will be shipping with the more powerful Voodoo3 3000. The SoundBlaster PCI 64 sound card is included. Build quality is good. Air holes in the sides of the inner case allow air thrown out by the processor fan to circulate between the inner and outer case, so taking the heat away from system components. Adding more components to this system should pose no problems. Even after the inclusion of the three drives, there are another four bays free, far more than in the other machines in this test, and all in a case that's a reasonable size. Additional PCI and DIMM slots are available, too.



**The CTX VL710T monitor** is in the same range as the VL710ST that comes with the Panrix system. However, while the Panrix ST has a shorter tube and a better screen, the T is the standard version. There is slight blurring at 1024 x 768 and above, in the top left corner of the screen.

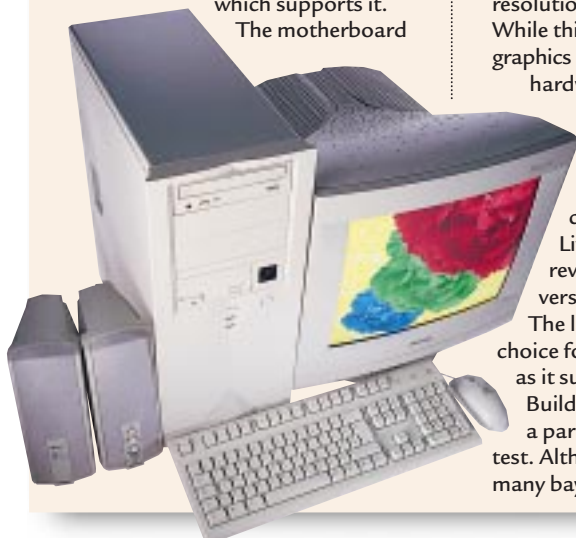
### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)  
**Contact** Cybermax 01462 636600  
[www.cybermax.co.uk](http://www.cybermax.co.uk)  
**Good Points** Good components. Easily upgradeable.  
**Bad Points** No hardware decoder for DVD.  
**Conclusion** Well specified and upgradeable.

<b>Build Quality</b>	★★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★★

## Dotlink Ace 3D

**Dotlink is the only vendor** in this test to bundle an Ultra DMA66 Western Digital hard drive. Ultra DMA66 promises a maximum throughput of 66.6Mb/sec, twice that of its predecessor, Ultra DMA 33. Storage devices including hard drives using the new standard are just hitting the market, but to get the most from the standard you need a motherboard with a chipset which supports it. The motherboard



in the Ace 3D doesn't have such a chipset and so the system's performance isn't noticeably faster. The inclusion of a faster hard drive makes for easier upgrading in the future, but the downside is that you will have to throw out the motherboard. Dotlink, too, has opted for the new Voodoo3 2000 with 16Mb of RAM, and its 350Hz Ramdac easily supports high resolutions and refresh rates. While this obviously boosts overall graphics performance, lack of hardware acceleration for the DVD drive remains an issue. Dotlink lets you choose between two options for the sound card: the SoundBlaster Live! was included in the review system, but the more versatile Vortex2 is available. The latter would make a better choice for watching DVD movies, as it supports Dolby Digital. Build quality of the Ace 3D is on a par with the best in this group test. Although it doesn't have as many bays free as the Cybermax

system, there are still enough for holding new components.

**Along with the Sony monitor**, the Hansol Mazellan 701P is undoubtedly one of the best in terms of image quality. There's no blurring or misconvergence, and its controls are intuitive, with many buttons on the front of the monitor.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)  
**Contact** Dotlink 0181 902 5802  
[www.dotlinkpc.com](http://www.dotlinkpc.com)  
**Good Points** Ultra DMA66 hard drive. Good build quality. Choice of sound cards.  
**Bad Points** No hardware DVD decoder.  
**Conclusion** A fast PC, but not too well specified.

<b>Build Quality</b>	★★★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★

## Hi-Grade Winputer PV 400

The most noticeable aspect of the PV 400 is its performance. The AMD's K6-III uses tri-level cacheing to increase performance, and the TMC motherboard has 1Mb of L3 cache. Tests have proved that 1Mb of L3 cache is the optimum size, being faster than either 512Kb or 2Mb of L3 cache. Performance drops off with 2Mb, as increased seek times counteract



the advantages of a larger cache. The motherboard, too, is the only one in this group test to have six PCI slots. Of these, four are free to hold more components. There are no ISA slots though, so if you have any legacy ISA devices you would want to use in your new machine, such as an old network card, you would have to specify a different motherboard. If however you're likely to want to use all PCI devices, this board doesn't hamper you with redundant ISA slots. The PV 400's impressive graphics performance is due to the powerful Voodoo3 2000 with 16Mb of RAM. This is a gamer's card and excels in performance, giving very high frame rates, but as it falls short on features such as 32-bit rendering, it's less suitable for general use. DVDs are best played using another card. Build quality is up there with the best. The ATX case is cooled by the usual dual-fan setup and the IDE cables are tucked away from critical components.

The CTX VL700 shadow mask monitor is from CTX's value range. As such it's perfectly acceptable, but it's not the best monitor we saw. There was neither blurring nor misconvergence to give you eye strain, but the image was not as sharp as others in this group test.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)  
**Contact** Hi-Grade 0181 532 6123  
[www.higrade.com](http://www.higrade.com)  
**Good Points** Six PCI slots. Excellent performance.  
**Bad Points** Meagre software bundle.  
**Conclusion** Well-specified, fast PC that's worth consideration.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★★

## Mertec Extreme 400

Mertec has a reputation for building high-quality PCs, and the Extreme 400 is another shining example. The power supply unit is placed well clear of the motherboard so it's very easy to remove or replace all the components. The large ATX case is well ventilated by two fans.



Upgradeability isn't a problem as there are ample slots free. Along with ALi, Via is the other major manufacturer of chipsets for Super 7 motherboards and Mertec has chosen an FIC unit with the Via Apollo MVP3 chipset, the only chipset to support over 512Kb of L3 cache. Sis is another name synonymous with motherboards, but as it specialises in low-end chipsets with integrated graphics, it isn't used by any of the systems reviewed here.

The graphics card is the powerful ATi Rage Fury with a massive 32Mb of RAM. Faster than the Riva TNT, the Rage 128 chipset supports full 32-bit colour and trilinear filtering for better image quality. Its 2D and 3D performance is more than you would need for business and is good for games. The inclusion of a powerful sound card, Creative Labs' SoundBlaster Live!, a joystick and surround speakers mean that gamers are well catered for. The speakers comprise four units: two stand in front of you and two behind to make it seem as if you're actually in the game's environment, rather than just looking at it.

The 5P+ is one of ADI's older monitors which has proved itself to be a consistently good performer. In our DisplayMate tests we noticed a slight misconvergence at the bottom right corner of the screen on the monitor we saw. Overall though, the ADI 5P is adequate for home and office use.

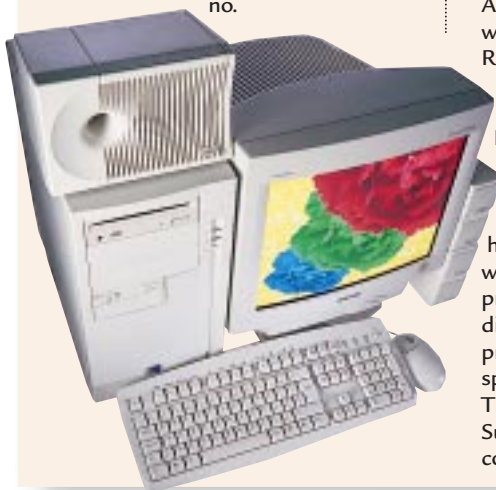
### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)  
**Contact** Mertec 01792 473700  
[www.mertec.co.uk](http://www.mertec.co.uk)  
**Good Points** Good components. High graphics performance.  
**Bad Points** Smallest hard disk in the test.  
**Conclusion** A well-built system.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★★

## New Century Performance K400

**New Century is a new name** to PCW. This London company employs around 20 staff and was established in 1994. Its Performance K400 proved an excellent introduction to the company for us, as it's a very well specified system: its build quality is outstanding. At first glance this PC looks as if it might have inherited the common problem of a power supply unit obstructing access to the CPU. But no.



The problem has cleverly been avoided by using an ATX case which allows the motherboard to slide out. Instead of multiple screws, there's only one clip holding the motherboard in place, allowing fast access. There's another useful touch, too: the 10Gb Quantum hard drive is located above the power supply unit, saving a valuable 3.5in bay at the front. There are ample free slots and bays in general. Although the graphics card included with this review system was an ATi Rage Fury, New Century offers the option of replacing it with the faster Voodoo3 2000. Its higher 350Hz ramdac and performance make it a good gamer's card although the Rage Fury is better all round. Sound is handled by the SoundBlaster Live! which carries out much of the sound processing for the CPU, while the digital joystick with its greater precision, and the four surround speakers, make the most of games. The excellent Diamond SupraExpress Pro V.90 modem completes the system.



### The Sony Multiscan 210ES

monitor is perhaps the most impressive part of the package. It's the only monitor in this group test with a Trinitron tube and benefits from all the features associated with this technology, including high brightness, vivid colours and a sharp picture. It's an excellent monitor to find with a mid-price system.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** New Century Computers  
0800 0568302

[www.newcenturycomputers.co.uk](http://www.newcenturycomputers.co.uk)

**Good Points** Excellent build quality and monitor.

**Bad Points** Few software titles included.

**Conclusion** A very good choice for home or office use.

<b>Build Quality</b>	★★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★★

## Panrix Nitro Max 400

**Panrix has a reputation** for building fast PCs and workstations, and the Nitro Max 400 is no exception — it's well built and well specified. This machine actually has three fans instead of the usual two, to keep all of the components cool. The ATX case can be opened by removing a single screw. The Nitro Max 400 is based around an FIC motherboard which uses the Via chipset. In many motherboards the position of the main



power socket hinders easy access to components, but this isn't a problem here, as it's located just behind the CPU. Other wires and cables are carefully looped and kept away from components. The Voodoo brand is associated with high graphics performance and, like the Hi-Grade Winputer PV 400 [p134] this Panrix system has the latest Voodoo3 2000 graphics card with 16Mb of RAM. Its brute performance is a powerful draw for gamers, but image quality is not quite as good as that of cards based around the Riva TNT chip.

However, the Nitro Max 400 was let down by its sound. Panrix had included the older SoundBlaster 64V card rather than the SoundBlaster Live! found in many of these systems. In addition, the speakers sound tinny compared with the sound produced by the surround speakers which had been included in many of the other systems.

**The CTX VL710ST** is an impressive 17in monitor. It's in the same family as the VL710T included with the Cybermax system, although it has a better tube than that monitor. It's also a short-neck version so it will take up less space on your desk than the average 17in monitor. It supports refresh rates of more than 100Hz at a resolution of 1024 x 768.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Panrix 0113 2444958

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

**Good Points** Excellent build quality. Large hard drive.

**Bad Points** Older-generation sound card.

**Conclusion** A fast PC.

<b>Build Quality</b>	★★★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★★



## Time 400-3 3D SV

**Time Computers** is one of the biggest PC retailers in the UK but sells a third of its systems direct. The 400-3 3D SV is aimed at the home entertainment and games market and is one of only two machines in this group test to have a CD-R drive; it's also the only one to include a TV-tuner card. A 36X CD-ROM is also provided. As befits a games system, the graphics card is the Hercules Dynamite TNT.



Although not as fast as the Voodoo3 chipset, the TNT has better features, such as 32-bit rendering which provides better image quality. High-quality sound is also necessary for full enjoyment of games, and the versatile SoundBlaster Live! card provides this. By carrying out sound processing, it also takes much of the strain away from the CPU, freeing it to carry out more geometry processing for the graphics when games are being played. A digital joystick, which gives better accuracy than its analogue counterparts, is also included. The components are enclosed in a medium-sized ATX case. There are two fans, with the standard Super 7 heatsink on the CPU. Inside, the power supply unit prevents easy access to some of the components, including the CPU, forcing you to twist your wrist to get it out. This aside, the build quality of this PC is good.



**The 17in LG Studioworks 778** monitor has a viewable area of 15.9in and supports a refresh rate of 85Hz at 1280 x 1024. We noticed some fuzziness at high resolutions, but this could be due to the graphics card. There is a reported problem with older drivers for the Diamond V550, but the latest ones should be fine.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Time Computers  
01282 777555

[www.timecomputers.co.uk](http://www.timecomputers.co.uk)

**Good Points** CD-R. TV tuner.  
Large software bundle.

**Bad Points** Power supply blocks access to some components.

**Conclusion** An extremely well specified PC.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★

## Watford Electronics Aries 3400

**The Aries 3400**, from Watford Electronics, is clearly pitched as a games system, with its two Voodoo2 cards in SLI (scan line interleave) configuration. These cards sit in two PCI slots and work in parallel to produce high frame rates. On its own this is a powerful setup for 3D games, but Watford hasn't stopped there: the main graphics card, a 16Mb Diamond Viper



V550, is capable of high-quality 3D rendering. Moreover, unlike the Voodoo2, it supports full 32-bit colour, which provides the buyer with the best of both worlds as they can switch from using the Diamond card to the two Voodoo2s, effectively choosing between quality and performance. A PCI SoundBlaster Live! and four-point surround speakers are included, along with a USB joystick. The Aries 3400 is easily upgradeable. The Asus motherboard, with its six-times multiplier, can accommodate CPUs up to at least 600MHz. Overall performance of this system is only marginally less than that of the Hi-Grade and Panrix PCs. The two Creative Labs Voodoo2 cards caused some problems during testing, most probably because of a driver conflict. The driver installed was the 3Dfx reference driver instead of the manufacturer's recommended version. The software package is substantial and includes games titles in addition to useful utilities such as PC Cillin and Rescue Me.

**The CTX 17XE monitor** has quite good image quality and supports high refresh rates. In this PC however, the video signal is routed through the two Voodoo2 cards passing through two filters, which leads to a certain degradation of the signal. This results in a slight blurring at resolutions above 1024 x 768.

### PCW DETAILS

**Price** £1,173.83 (£999 ex VAT)

**Contact** Watford Electronics  
01582 745577

[www.watford.co.uk](http://www.watford.co.uk)

**Good Points** High performance.  
Dedicated gaming components.

**Bad Points** Problem with Voodoo2 drivers.

**Conclusion** A games PC that's worth a look.

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★

## THE K6-III EXPLAINED

**T**here are two crucial differences which set the K6-III apart from its predecessor. The K6-2 has 64Kb of L1 cache and 512Kb of L2 cache located on the motherboard. The latter is tied to the Super 7 motherboard's front-side bus speed of 100MHz; this proved to be a bottleneck. While the K6-2 processors increased in clock speed, the L2 cache remained locked at around 100MHz. This also put the K6-2 at a disadvantage compared with Intel's Celeron processors, where the L2 cache runs at the core speed of the processor.

**The K6-III copies the Celeron** in how it eliminates this bottleneck. Its 256Kb L2 cache is located on the die itself and, more importantly, runs at the same clock speed as the processor. The K6-III also benefits from a further level of cache memory. L3 cache is located on the motherboard and

comes in sizes of either 512Kb, 1Mb or 2Mb. Tests show that 1Mb of L3 cache is probably the optimum amount, storing enough data to speed up data flow to the processor's execution units, yet not so large that the longer search times actually impede faster performance. **Thanks to these changes, the K6-III is proving to be much faster than its predecessor. The increased cache memory makes this tremendous performance leap possible but it's also due to the design of the K6 architecture.**

**AMD has always claimed** that the K6 architecture computes data much faster than its rivals, but to work this fast it depends on being fed a steady stream of data. The K6-2, with its slow L2 cache, simply couldn't supply enough data from system memory. The tri-level cache used by the K6-III, especially the processor core speed L2 cache, eliminates this problem.

However, this performance increase applies mainly to integer-reliant office applications. Floating-point-intensive applications such as games tell a slightly different story. The K6-III's floating point unit (FPU) is not as fully pipelined as Intel's Pentium II, Pentium III or Celeron. Therefore, even though the data is reaching the FPU much faster, it's processed much slower. This handicap is offset to some extent by the 3D Now! instructions. Applications which support them will show almost the same performance as Intel's CPUs.

**The key advantage** of the K6-III is its cost. Priced well below Intel's Pentium II and Pentium III CPUs, the K6-III offers comparable performance. Therefore, like its predecessor, it's certain to be a success in the mid-range PC market. It's doubtful however whether it can displace the faster Pentium III: that glory might belong to AMD's forthcoming K7 CPU.

# Intel-AMD marketing battle

**C**o-marketing, rather than bullying, is the key to chip companies' success these days, and Intel has confirmed that it will not use bullying tactics to persuade its customers which make PCs to go with the Pentium III rather than the AMD K6-III. Whether money for vendors' marketing campaigns such as the Intel Inside programme persuades AMD's customers and Intel's original equipment manufacturers (OEMs) to use either's chip, is however a moot point. Intel Inside money can only be used to advertise machines with Intel processors, not AMD chips.

Damien Callaghan, director of the Intel Inside programme in Europe, the Middle East and Africa (EMEA) insists that his company will not discriminate against PC manufacturers which use the AMD K6-III rather than the Pentium III. His counterpart at AMD, Rana Mainee, analyst director for the whole of Europe, has a different point of view.

Intel doesn't want to be seen as any

kind of a bully, and Callaghan said he doesn't mind his OEMs using AMD parts. He agreed that it's a fact of life. He said: 'Every OEM which buys into Intel Inside can take part in this scheme. I'm not able to talk about pricing. Intel prices have dropped quite regularly over a period of time. Intel Inside is a co-operative program which supports OEMs.' AMD's Mainee takes a different stance. He said: 'There's always been pressure from Intel to guide people towards its own microprocessor. We believe that people will buy the AMD K6-III processor on its own merits. We've said that you make more money selling AMD rather than Intel processors. They [the manufacturers] get more money selling AMD microprocessors.'

The difference is all to do with co-operative marketing. Intel has a broad

scheme which means that any customer will get the Intel Inside money. Callaghan, from Intel, has confirmed that the scheme is not exclusive and it won't rule out original equipment manufacturers which use AMD chips as well. But AMD, with far less marketing cash than Intel, and smaller profits,

targets companies which it thinks will benefit from the limited amount of money it has.

So, both companies insist that there's no Intel

bullying agenda. Earlier this year, Paul Otellini, a senior VP at Intel US, said that if anyone leaned on clients, they would be instantly dismissed. He then said: 'If a salesperson said that they wouldn't sell Intel chips because a company was buying AMD chips, they'd be fired on the spot.' The days of bullying are over, insists Intel.

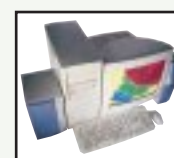
MIKE MAGEE

***'There's always been pressure from Intel to guide people towards its own microprocessor'***





# Table of features

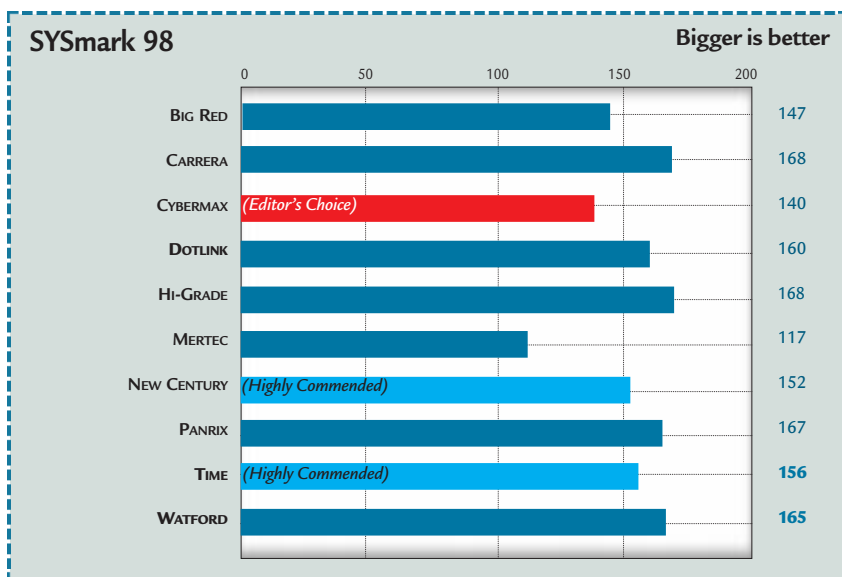


MANUFACTURER	BIG RED	CARRERA	CYBERMAX	DOTLINK	HI-GRADE
MODEL NAME	VOYAGER 3 400XL	SIRUS M400	DAREDEVIL	ACE 3D	WINPUTER PV 400
Price (ex VAT)	£999	£999	£999	£999 (inc 1yr on-site maint.)	£999
Price (inc VAT)	£1,173.83	£1,173.83	£1,173.83	£1,173.83	£1,173.83
Telephone	08700 711 117	0181 307 2800	01462 636 600	0181 902 5802	0181 532 6123
Fax	08700 733 337	0181 307 2850	01462 632 600	0181 903 6508	0181 532 6110
URL	<a href="http://www.bigred.co.uk">www.bigred.co.uk</a>	<a href="http://www.carrera.co.uk">www.carrera.co.uk</a>	<a href="http://www.cybermax.co.uk">www.cybermax.co.uk</a>	<a href="http://www.dotlinkpc.com">www.dotlinkpc.com</a>	<a href="http://www.higrade.com">www.higrade.com</a>
HARDWARE SPECS					
Processor	AMD K6-III 400	AMD K6-III 400	K6-III 400	K6-III 400	AMD K6-III 400
RAM/type	128Mb/SDRAM	128Mb/SDRAM	128Mb/SDRAM	128Mb/SDRAM	128Mb/SDRAM
RAM slots taken / free	1 / 2	1 / 2	1 / 2	1 / 2	1 / 2
Hard disk	Seagate Medalist 8641	IBM Deskstar 14GXP	Maxtor DiamondMax	Western Digital	IBM Deskstar 14GXP
Hard disk size/interface	8.6Gb / IDE	10.1Gb / IDE	11.5Gb / IDE	10Gb / IDE	10.1Gb / IDE
Storage drive	x	LS 120	Sony CD-RW	x	x
Size of media	x	120Mb	650Mb	x	x
Storage drive interface	x	IDE	IDE	x	x
MOTHERBOARD COMPONENTS					
Motherboard	Gigabyte	Asus	BioStar	Gigabyte	TMC
Chipset	ALI Aladdin V	ALI Aladdin V	ALI Aladdin V	ALI Aladdin V	Via Apollo MVP3
L3 cache	512Kb	512Kb	512Kb	512Kb	1Mb
EXPANSION AND I/O					
3.5in / 5.25in bays	3 / 3	3 / 3	3 / 4	3 / 3	2 / 3
Free 3.5in / 5.25in bays	2 / 2	2 / 1	2 / 2	2 / 2	1 / 2
PCI/ISA/shared slots	4 / 2 / 1	4 / 2 / 1	4 / 2 / 1	4 / 2 / 1	6 / 0 / 0
Free PCI/ISA/shared slots	2 / 1 / 1	2 / 1 / 1	2 / 2 / 1	2 / 2 / 1	4 / 0 / 0
USB/Serial/Parallel/PS2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2
MULTIMEDIA					
CD-ROM manufacturer	Pioneer DVD	Panasonic DVD	Toshiba DVD	Hitachi DVD	Hitachi DVD
CD-ROM speed/interface	6X DVD/IDE	4.8X DVD/IDE	5X DVD/IDE	4X DVD/IDE	4X DVD/IDE
Sound card manufacturer	Creative Labs	Aureal Semiconductor	Creative Labs	Creative Labs	Creative Labs
Sound card model	SoundBlaster Live! Value	Vortex2	SoundBlaster Live! Value	SoundBlaster Live! Value	SoundBlaster Live! Value
Speakers	Asshima 3D	ACS90	Altec Lansing ACS 45.1	Yamaha YST-M20	Samsung SMS-5100
Graphics card	Diamond Viper V550	STB Voodoo3 2000	STB Voodoo3 3000	STB Voodoo3 2000	STB Voodoo3 2000
RAM/max RAM/type	16Mb / 16Mb SDRAM	16Mb / 16Mb SDRAM	16Mb / 16Mb SDRAM	16Mb / 16Mb SDRAM	16Mb / 16Mb SDRAM
Graphics card interface	AGP	AGP	AGP	AGP	AGP
Monitor	Viewsonic GT775	Ilyama S702GT	CTX VL710T	Hansol 701P	CTX VL 700
Monitor size/Max viewable	17in / 15.9in	17in / 15.7in	17in / 15.7in	17in / 15.7in	17in / 15.7in
Max refresh - 800 x 600	120Hz	130Hz	100Hz	100Hz	85Hz
Max refresh - 1024 x 768	85Hz	107Hz	100Hz	100Hz	85Hz
Max refresh - 1280 x 1024	75Hz	90Hz	85Hz	75Hz	60Hz
Max refresh - 1600 x 1200	60Hz	75Hz	75Hz	NA	NA
OTHER INFORMATION					
Modem	Etec 56K 1V90	Rockwell 56K	Rockwell 56K	Rockwell 56K	Accord 56K
Highest supported standard	V.90	V.90	V.90	V.90	V.90
Misc hardware	x	Headphones	MS Sidewinder Joystick	x	Genius F22X Joystick
Bundled software	Lotus SmartSuite Mill, IBM Via voice, World Book 99	Lotus SmartSuite Mill, IBM Via voice	Office Suite 8, Cinemaster, DVD, multimedia bundle	Lotus SmartSuite 97	Lotus SmartSuite Mill
Standard warranty	1yr on-site	1 yr RTB	1 yr RTB	1 yr on-site	1yr on-site
Warranty options	3 yrs on-site	2 yrs RTB	3 yrs on-site	3 yrs on-site	3yrs on-site
Sales hours	Mon - Fri 9 - 6	Mon - Fri 9-6, Sat 10-5	Mon-Fri 9-6, Sat 10-2	Mon-Fri 9.30 - 6, Sat 11-2	Mon - Fri 9 - 5.30
Technical support hours	Mon - Fri 9 - 6	Mon - Fri 9-6, Sat 10-5	24 hours, 7 days	Mon-Fri 10 - 5.30	Mon - Fri 9 - 5.30

# Table of features

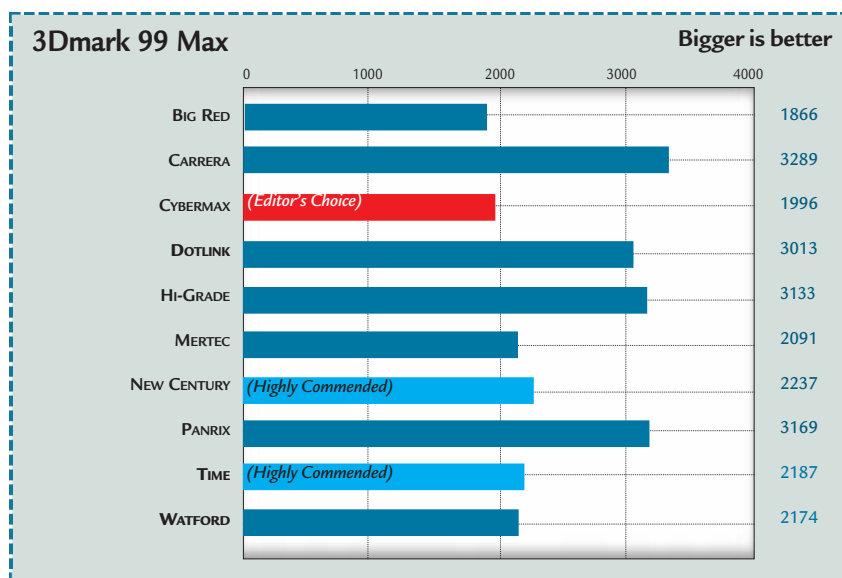


MANUFACTURER	MERTEC	NEW CENTURY	PANRIX	TIME COMPUTERS	WATFORD
MODEL NAME	EXTREME 400	PERFORMANCE K400	NITRO MAX 400	TIME 400-3 3D SV	ARIES 3400
Price (ex VAT)	£999	£999	£999	£999	£999
Price (inc VAT)	£1,173.83	£1,173.83	£1,173.83	£1,173.83	£1,173.83
Telephone	01792 473700	0800 0568302	0113 2444958	01282 777555	01582 745577
Fax	01792 473887	0181 930 4528	0113 2444962	01282 770844	0870 7295648
URL	<a href="http://www.mertec.co.uk">www.mertec.co.uk</a>	<a href="http://www.newcenturycomputers.co.uk">www.newcenturycomputers.co.uk</a>	<a href="http://www.panrix.com">www.panrix.com</a>	<a href="http://www.timecomputers.co.uk">www.timecomputers.co.uk</a>	<a href="http://www.watford.co.uk">www.watford.co.uk</a>
HARDWARE SPECS					
Processor	AMD K6-III 400	AMD K6-III 400	AMD K6-III 400	AMD K6-III 400	AMD K6-III 400
RAM/type	128Mb/SDRAM	128Mb/SDRAM	128Mb/SDRAM	128Mb/SDRAM	128Mb/SDRAM
RAM slots taken / free	1 / 2	1 / 2	1 / 2	1 / 2	1 / 3
Hard disk	Maxtor DiamondMax	Quantum Fireball	Western Digital AC29100	IBM Deskstar 14GXP	IBM Deskstar 14GXP
Hard disk size/interface	8.3Gb / IDE	10Gb / IDE	9.1Gb / IDE	10.1Gb / IDE	10.1Gb / IDE
Storage drive	x	x	x	Philips CD-R COO 3610	x
Size of media	x	x	x	650Mb	x
Storage drive interface	x	x	x	IDE	x
MOTHERBOARD COMPONENTS					
Motherboard	FIC	Azza	FIC	Asus	Asus
Chipset	Via Apollo MVP3	Via Apollo MVP3	Via Apollo MVP3	ALI Aladdin V	ALI Aladdin V
L3 cache	1Mb	512Kb	1Mb	512Kb	512Kb
EXPANSION AND I/O					
3.5in / 5.25in bays	2 / 3	2 / 3	2 / 2	3 / 3	3 / 3
Free 3.5in / 5.25in bays	1 / 2	2 / 2	1 / 2	1 / 1	2 / 2
PCI/ISA/shared slots	4 / 2 / 1	3 / 3 / 1	2 / 4 / 0	5 / 2 / 1	4 / 2 / 1
Free PCI/ISA/shared slots	2 / 2 / 1	1 / 3 / 1	2 / 2 / 0	2 / 2 / 1	2 / 1 / 1
USB/Serial/Parallel/PS2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2	2 / 2 / 1 / 2
MULTIMEDIA					
CD-ROM manufacturer	Creative Labs	Creative Labs DVD	Creative Labs DVD	LG	Hitachi DVD
CD-ROM speed/interface	5X DVD/IDE	5X DVD Encore/IDE	5X DVD/IDE	32X/IDE	4X DVD/IDE
Sound card manufacturer	Creative Labs	Creative Labs	Creative Labs	Creative Labs	Creative Labs
Sound card model	SoundBlaster Live! Value	SoundBlaster Live! Value	SB 64V	SoundBlaster Live! Value	SoundBlaster Live! Value
Speakers	PC Works Surround	PC Works Surround	Arowana 160W	Logic 3 SB300	PC Works Surround
Graphics card	ATI Rage Fury	ATI Rage Fury	STB Voodoo3 2000	Hercules Dynamite TNT	Diamond Viper V550
RAM/Max RAM/type	32Mb / 32Mb SDRAM	32Mb / 32Mb SDRAM	16Mb / 16Mb SDRAM	16Mb / 16Mb SDRAM	16Mb / 16Mb SDRAM
Graphics card interface	AGP	AGP	AGP	AGP	AGP
Monitor	ADI SP+	Sony MultiScan 210ES	CTX VL710ST	LG Studioworks 778	CTX 17XE
Monitor size/Max viewable	17in / 15.9in	17in / 15.9in	17in / 15.7in	17in / 15.9in	17in / 15.7in
Max refresh - 800 x 600	85Hz	120Hz	120Hz	85Hz	100Hz
Max refresh - 1024 x 768	85Hz	100Hz	117Hz	75Hz	85Hz
Max refresh - 1280 x 1024	60Hz	75Hz	85Hz	60Hz	75Hz
Max refresh - 1600 x 1200	N/A	60Hz	75Hz	N/A	60Hz
OTHER INFORMATION					
Modem	Rockwell 56K	Diamond SupraExpress Pro	Rockwell 56K	Modular Technology	Rockwell 56K
Highest supported standard	V.90	V.90	V.90	V.90	V.90
Misc hardware	Saitek Cyborg, 3D joystick	Sidewinder Pro joystick	x	Sidewinder Pro joystick, PCI TV card	Dual Creative Voodoo2
Bundled software	ATI DVD Player, Lotus SmartSuite 97, games pack	ATI DVD Player, Urban Assault, Trio, Quake2, Easy-Key	Ultrapack 10	Lotus SmartSuite Mill, games, Norton Antivirus, IBM SS Exec	Quake II, Unreal, G-Police, Rescue Me, PC Cillin
Standard warranty	5 yrs RTB, 2 yrs parts & lab	1 yr RTB	1 yr RTB	1 yr RTB	1 yr RTB
Warranty options	3 yrs on-site	3 yrs on-site	3 yrs on-site	3 to 5 yrs RTB	5 yrs RTB
Sales hours	Mon - Fri 9 - 6	Mon - Fri 9 - 6, Sat 10 - 2	M-Fri 9.5.30, Sat 10.30-4	Mon - Fri 8.30 - 5.30	Mon-Fri 8.30-7, Sat 9-6
Technical support hours	Mon - Fri 9 - 5	Mon - Fri 9 - 6, Sat 10 - 2	M-F 9.30-5.30, Sat 10.30-4	Mon - Fri 8.30 - 7, Sat 9 - 5	Mon-Fri 10-6, Sat 10-4



**S**YSmark 98 scores reflect the performance of various sub-systems such as hard drive, memory, CPU and system throughput. Out of these, SYSmark 98 performance is heavily dependent on available memory, speed of hard drive and CPU power. Since the CPU is the same in all these systems, the difference in scores is clearly dependent on the first two components. Some PCs with slightly lower scores had applications other than Windows 98 running in the background, which reduces the available memory for running the main application. Similarly, if the hard drive is slower, it takes longer to load new programs. The Mertec score is lower than anticipated due to a fault on the hard disk.

**3**D Mark99 Max gives individual scores to its constituent tests like trilinear filtering and multitexturing. The final score is a cumulative one. However, this benchmark is primarily meant to judge the brute power of each graphics card. So, the best scores are produced by graphics cards which have high fill rates and triangle drawing abilities. For instance, the Voodoo3 2000 chipset has a maximum theoretical fill rate of 286 million texels. This is much greater than the 180 million texels produced by the Riva TNT. Therefore, even though the latter has better features like 32-bit rendering, the Voodoo3 reigns supreme in terms of speed.



## How we did the tests



**SYSmark measures** the time it takes a PC to perform tasks in 14 common office and content creation apps. Each test is run three times to ensure consistent results. The applications are:

➤ **Office productivity**, CorelDraw 8, Excel 97, NaturallySpeaking 2.02, Netscape Communicator 4.05, OmniPage Pro 8.0, Paradox 8, PowerPoint 97 and Word 97.

➤ **Content Creation**: MetaCreations Bryce 2, Avid Elastic Reality 3.1, Macromedia Extreme 3D 2, Photoshop 4.01, Adobe Premiere 4.2, and XingMPEG Encoder 2.1.

➤ **Performance** depends on processor speed, RAM, graphics card and disk I/O. Because the tests are based on widely available software packages, SYSmark scores accurately reflect how the machine will perform in a real-world situation.

➤ **3DMark99 Max** is an instruction set optimised version of 3dMark99 from Futuremark Corporation which tests the 3D capabilities of the PCs. When applicable, the suite of tests will draw on AMD's 3DNow! or Intel's KNI instruction sets. It uses a Real World DirectX6.1 3D game engine to produce one result from a balanced testing methodology that includes image quality, rendering speed, CPU capability and, depending on hardware support, a test for embossed bump-mapping. All 3DMark99 Max bench tests are performed at 1,024 x 768 resolution in 16-bit colour depth with the test suites set to loop three times. The higher the score, the better the result. Unfortunately, due to the implementation of instruction set optimisation, no comparison can be made between the results from the original 3DMark99 and the Max version.

• More details at [www.3dmark.com](http://www.3dmark.com).



# Editor's Choice

**A**MD, with its K6-II and K6-III line of CPUs, has a firm footing in the budget processor market, standing up well against Intel's Celerons. The K6 processors always promised comparable performance with Intel's products, while coming in much cheaper, and the new K6-III fulfils that promise.

The efficient K6 architecture, along with the tri-level cacheing system, consistently achieves performance that almost matches Intel's fastest CPUs, and the SYSmark 98 scores posted by the systems in our group test testify to this. Although the fastest PCs like those from Carrera and Hi-Grade had only 400MHz K6-III CPUs, their overall performance is comparable to similar PCs with Intel's more expensive Pentium III 450MHz processors. PCs with the K6-III processors are particularly good at regular office applications such as Word, Excel and PowerPoint.

Without the help of 3D Now!, pure floating point performance still lags behind even Intel's low-end Celeron processors. Even with the core processor speed L2 cache in the K6-III – which is why the Celeron is marginally faster than the PII on floating point operations – Intel's superior

## ▼ THE TIME 400-3 3D SV



manufacturer has skimped on other components. The DareDevil is a well-equipped system for games or for office work, and performs well. For these reasons, the CyberMax DareDevil is our **Editor's Choice**.

▼ **The Time 400-3 3D SV** is almost as impressive. It has a CD-R as well as a good graphics card in the form of the Hercules Dynamite TNT. With its huge software bundle and TV-tuner card, it would make a good games or multimedia PC and is deservedly **Highly Commended**.

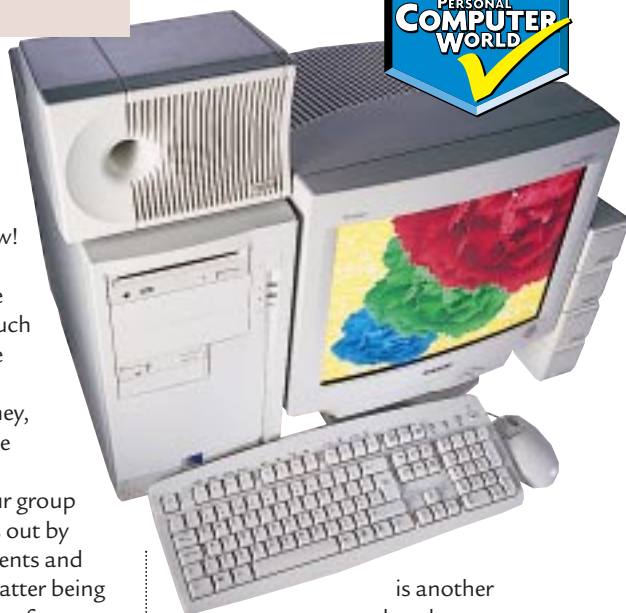
floating point unit wins through. Floating point performance is critical for 3D rendering and CAD/CAM operations. Games also make extensive use of floating point calculations, but here the K6-III will be less affected thanks to growing support for 3D Now! from developers.

The key advantage of the K6-III is its price. Costing much less than a Pentium III of the same speed and giving the Celerons a run for their money, this CPU is excellent value for money.

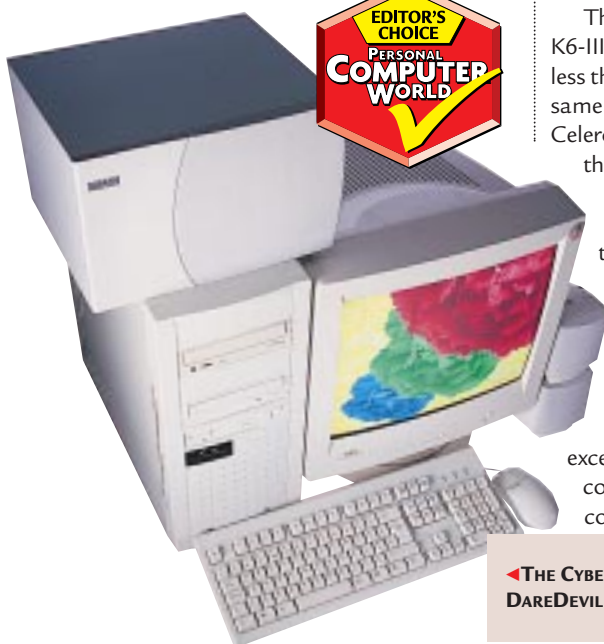
Of all the PCs in our group test, one system stands out by virtue of its components and build quality – the latter being particularly important for reliability and ease of upgrading.

▼ **The CyberMax DareDevil** excels in both these areas. It has two components which no other system contained: a Sony CD-RW and a Voodoo3 3000 graphics card. However, this doesn't mean that the

▼ **The Performance K400**, from New Century Computers,



is another system that deserves credit for build quality and so it, too, is **Highly Commended**. With its innovative ATX case which allows the motherboard to slide out, the positioning of the hard drive, its upgradeability and performance, this is a robust system. The New Century package also includes the best monitor we saw in this group test, a Sony Multiscan 210ES.



## ▼ THE CYBERMAX DAREDEVIL