
40X MAX
Mazellan 50IP
PHILIPS
Hansol

Second solution

Where can you cut corners when you're buying a second PC on a budget? We asked ten vendors to give it their best shot.

When money's tight and you've got a PC to buy, you have to make concessions and pare down the specification so you can keep to your budget. But these concessions needn't limit your choice, as vendors sell more flavours than Ben & Jerry in an effort to offer what they think will be the ideal solution.

With a strict price limit of £699 including VAT, we told ten vendors that we wanted a home PC to run office applications when you can't get access to the kids' gaming system, but wasn't to be thought of as the user's main workstation. As it was to be a home machine, we limited the size of the monitor to 15in, giving us the chance to evaluate smaller displays.

We asked for internet connectivity and reasonable multimedia capabilities – well, it's not all work in the comfort of your home, we hope.

We get to the nitty gritty of what really matters in a system at this price, sorting out what represents good value and what will give you the best performance for the lowest price.

Ratings

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

Contents

◆ *Tested and reviewed by Ian Robson*

A-Class A6

Providing an integrated chipset solution as the basis for a budget system is an understandable option but A-Class then spent a whole lot of money providing a Pentium III 450MHz processor [*see p150*]. Unfortunately, this leaves the setup seemingly unbalanced, as the graphics sub-system struggles to keep up with the processor.

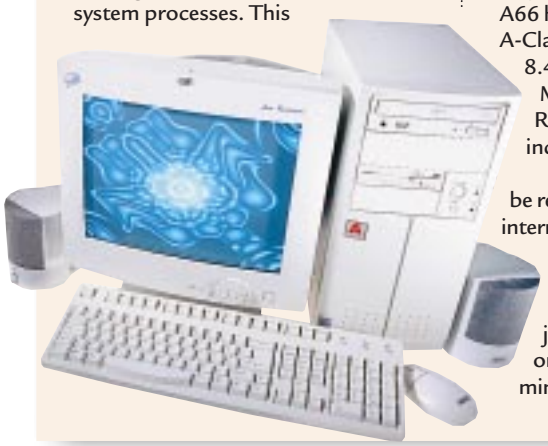
The SiS 620 chipset chosen by A-Class has only 8Mb of system memory allocated for graphics, sharing the data lines with other system processes. This masks the power of the PIII450, slowing down overall peformance. Even the full quota of 128Mb RAM provides no escape from this graphics bottleneck.

Other integrated peripherals are less troublesome, with a Davicom ethernet chip for potential home networking, and a processor-emulated 56K modem. Both have ports on riser cards which take up two backplates.

Another aspect of the SiS 620 chipset is its support for the UDMA A66 hard-disk interface protocol. A-Class, however, opted for an 8.4Gb UDMA33 hard disk from Maxtor, although the 6X DVD-ROM drive is a welcome inclusion.

The whole system case must be removed to gain access to the internal components, and first impressions are not inviting — cables are strewn in disarray across the system. And there's just one shared PCI/ISA slot and one front-accessed 5.25in bay — mind boggling, considering that the motherboard is a dual Socket 370/Slot 1 board.

The abysmal, but very cheap, Proview monitor is uncomfortable to work with: even at a resolution of 800 x 600, there is a shimmying effect. Colours are washed out, and no amount of fiddling with the OSD could provide satisfactory results.



PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *A-Class 0181 324 1699*
www.a-class.net
Good Points *PIII processor.*
Bad Points *Poor monitor and graphics sub-system.*
Conclusion *Worth considering as a 'bare-bones' purchase.*

Build Quality	★★
Performance	★★
Value for Money	★★★★
Overall Rating	★★

Big Red Mercury 350/3D

On the outside, Big Red has smooth styling and a squat case. Functionally, the system's hardware setup is a bit of a hit-and-miss affair. The 16Mb Diamond Viper V550 graphics adapter is no match for the quality solutions provided elsewhere in this group. Coupled with the processing power of a 350MHz AMD K6-2 this system is playing a constant game of catch-up as it tries to reach the dizzy heights of the competing machines. Looking over the solutions provided elsewhere in this group Big Red's choice is just a tad lacklustre. A 2X DVD-ROM drive and Creative's very capable SoundBlaster 64 Value sound card complete the package.

The rather modest 6Gb Fujitsu hard disk will very quickly fill up, although upgrade options are available and become apparent when you access the system via the side panel. The only real concern over build quality is the choice of a case with a power supply unit that restricts access to the processor. To upgrade the processor you will have to unplug the motherboard cables and peripheral cards, unscrew the other side panel and take off the motherboard mounting plate. Not ideal.

Big Red goes some way to redeeming itself by supplying a first-class monitor. Viewsonic's E655 is quite capable of holding a solid 85Hz refresh at a resolution of 1024 x 768, and if the sharp but tiny characters at this resolution offend you, you can work at an even firmer 100Hz refresh by dropping to 800 x 600. Add to this the warm, bright colours and an equally intuitive and responsive OSD, and you'll be happy to work at length with this display.

PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *Big Red 08700 711 117*
www.bigred.co.uk
Good Points *Excellent monitor.*
Bad Points *Choice of processor.*
Conclusion *Too much spent on graphics: other components suffer.*

Build Quality	★★★
Performance	★
Value for Money	★★
Overall Rating	★★

Carrera Lynx W466

HIGHLY COMMENDED
PERSONAL COMPUTER WORLD

Carrera decided to offer a system combining the Whitney integrated chipset and the fastest available 466MHz Celeron, taking advantage of the lower-profile Socket 370 processor with a small but perfectly formed system case.

A generously-sized 10Gb IBM hard disk is supplied with full UDMA66 interface protocol support. It's unlikely this will contribute huge performance improvements with this system's likely usage, but these drives cost little more than the older UDMA33 standard drives and it's good not to hold back any option that might increase performance.

You can access the inner workings of the Lynx by removing the whole case, and it's not a huge surprise that the compact case offers few opportunities for upgrading. Most noticeable is the lack of peripheral-card slots, with Carrera deciding to put its 56K modem in a PCI slot, rather than using the processor and a riser card to emulate a modem — an option supported by the integrated chipset [*see p150*].

Only one 5.25in front access bay is left, with room to squeeze in one more hard disk, and that's about it.

For a 15in monitor, the LG Electronics unit supplied here is adequate at commonly-used resolutions. It will manage an 85Hz refresh rate at 1024 x 768. Image sharpness and colour representation are better on other monitors in this group test, but on the LG they're not unpleasant, even at lengthy periods. The OSD uses basic navigation with very responsive controls, and for ease of access, the brightness and contrast controls have been duplicated as external dials.

PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *Carrera 0181 307 2800*
www.carrera.co.uk
Good Points *Good-quality construction. Compact design.*
Bad Points *Limited upgrade options.*
Conclusion *Powerful and reliable setup.*

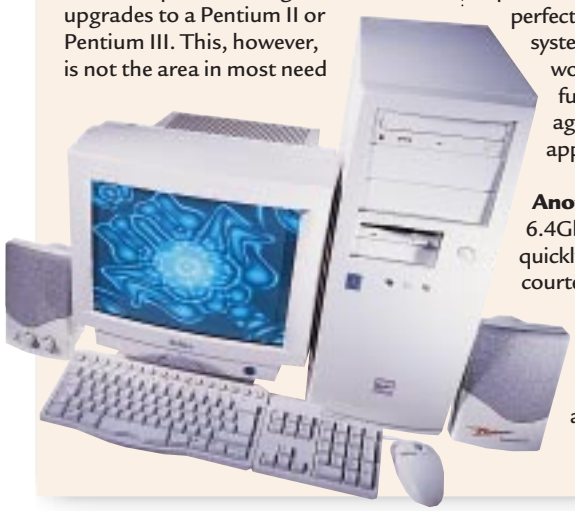
Build Quality	★★★★★
Performance	★★★
Value for Money	★★★
Overall Rating	★★★★

DCS Solo DVD

Rather than provide a modest-sized system that could be placed discreetly in the corner of a room, DCS plumped for something approaching the specification of a full tower case. Options to upgrade are immediately apparent with the choice of components.

The Socket 370 version of the 433MHz Intel Celeron processor is placed on the Slot 1 motherboard via an adapter, allowing for future upgrades to a Pentium II or Pentium III. This, however, is not the area in most need of attention — the graphics adapter screams for replacement. It's a long time since we've seen an ATi Xpert98 chosen as the display sub-system. It was a quality card last year, but it has been superseded by far superior budget graphics alternatives.

Another cheap upgrade could be achieved by boosting the system memory, currently set at 64Mb. This would also give an immediate performance boost. While 64Mb is perfectly adequate for the current system setup, another 64Mb is worth considering as it would future-proof your machine against memory-hungry applications.



Another modest choice is the 6.4Gb Fujitsu hard disk that will quickly fill up. Audio comes courtesy of an ESS chipset and Typhoon speakers. Thanks to the increased case size, the internal build is tidy and spacious with plenty of bays and bus slots for upgrading.

The bundled Belinea monitor is disappointing, with a poorly-focused display even at a modest resolution of 800 x 600. Attempting 1024 x 768 immediately drops the refresh rate to an unworkable 60Hz, making higher resolutions quite out of the question.

PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *DCS 0121 414 7575*
www.dcsplc.co.uk
Good Points *Plenty of upgrade options.*
Bad Points *Poor monitor and poor choice of graphics card.*
Conclusion *The user will need to take advantage of the upgrade options.*

Build Quality	★★★★
Performance	★★
Value for Money	★
Overall Rating	★★

Dotlink Charisma 400 Pro

Dotlink provided a large system case and took advantage of the extra available space by supplying a dual Slot 1/Socket 370-based motherboard. Initially based on a 400MHz Socket 370 Celeron processor, you'll be able to upgrade later to a Slot 1 Pentium II or III.

However, the extra cost of this board may have been the reason for the lower-speed processor compared to other offerings in this group test, and the reserved 64Mb system memory contributes to an overall lower than average performance.

The ATi graphics sub-system is based on the Rage 128 GL processor, resulting in respectable 3D performance scores and providing excellent colour depth and resolution options. To complete the package there is an LG Electronics 40X CD-ROM drive and an on-board sound chip pulsing cleanly through the stylish Philips speakers.

A single thumbscrew releases the top of the system case, allowing a side-panel to glide off with ease. The spacious interior is made all the more appealing through attention to detail: cables are not only clipped tidily, they're also dangled by the device bays they're most likely to serve.

Upgrade options are adequate, with a couple of peripheral slots and device bays of each available size, and Dotlink has taken note of the second home PC ideal with a PCI-based 10/100Mbit ethernet card.

The Hansol monitor doesn't do the graphics sub-system justice, but the rock solid 85Hz refresh rate at 1024 x 768 will be ample for the 13.8in viewing area. An extremely comprehensive and responsive OSD ensures that the rich colours and sharp picture are at their best.

PCW DETAILS

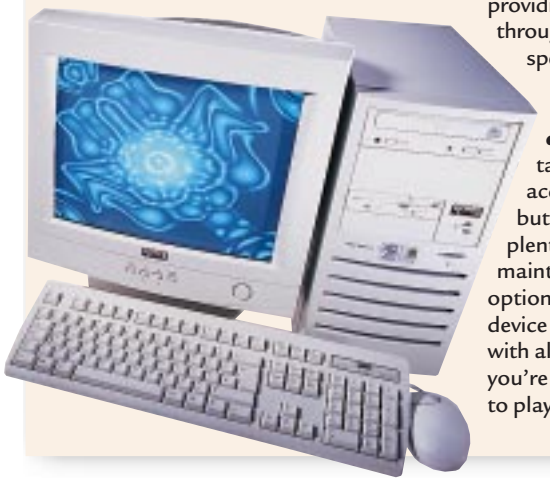
Price *£699 inc VAT (£594.89 ex VAT)*
Contact *Dotlink 0181 902 5802 www.dotlinkpc.com*
Good Points *Upgrade path to Pentium II and Pentium III.*
Bad Points *Not the best-performing system here.*
Conclusion *Well-balanced system with long life expectancy.*

Build Quality	★★★★
Performance	★★★
Value for Money	★★★
Overall Rating	★★★

Elonex MCX-6466/I

The name of this Elonex system refers to the 466MHz Intel Celeron processor which was chosen by many vendors in this test. On this occasion, however, it is supported by a fine choice of components.

Graphics is integrated into the Whitney chipset, although this does not adversely affected overall system performance. The 128Mb system memory accounts for some of the good performance scores, even though it runs on the 66MHz bus.



A passing nod must be given to the UDMA66 support for the 8.4Gb Fujitsu hard disk. Over long sequential data transfers, the performance improvements will be apparent.

Elonex has taken full advantage of the Whitney chipset's integrated digital modem with a riser card which holds the digital-to-analogue converter and provides the telephone interface [*see p150*]. Sound is the last notable integrated solution, providing adequate reproduction through Creative Labs' CSW20 speakers.

A traditional, squat case design means you have to take off the whole case to access the machine's interior, but once inside, the layout allows plenty of room for upgrading and maintaining the PC. Upgrade options are limited, with only one device bay of each size available; and with all the integrated peripherals, you're left with just three PCI slots to play with.

HIGHLY COMMENDED
PERSONAL COMPUTER WORLD

The rebadged TVM monitor supports an 85Hz refresh rate at 1024 x 768. The colours are vibrant, and although there is some degradation of RGB gun registration towards the screen edge, it does not hinder viewing. The OSD's control options are limited but handle responsively.

PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *Elonex 0181 452 4444 www.elonex.co.uk*
Good Points *Well-balanced choice of components.*
Bad Points *Limited upgrade options.*
Conclusion *Ideal integrated solution but limited upgradeability.*

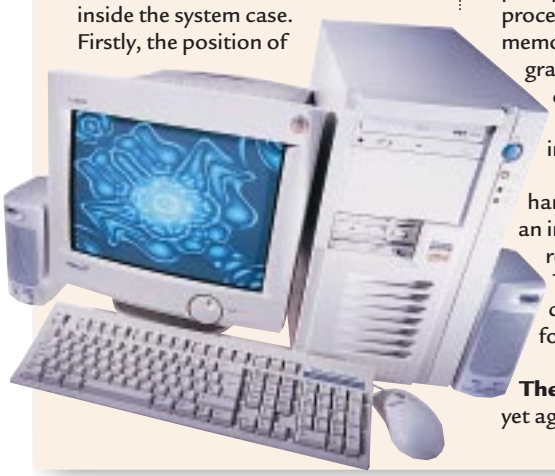
Build Quality	★★★★
Performance	★★★
Value for Money	★★★★
Overall Rating	★★★★

Protek UltraMX

Protek's system presented us with three unpleasant beeps and no monitor signal when we first turned the power on. These indicators told us that the AGP graphics card was not slotted in firmly, a problem that used to occur regularly in earlier incarnations of AGP slots and is not welcome on its return. Firmly pressing down the AGP card rectified the problem, but a number of other worrying construction details were observed once we were inside the system case. Firstly, the position of the power supply unit has left little room for the Socket 370 to Slot 1 adapter card. This did not deter Protek's engineers, however, as they proceeded to force the motherboard, bending it slightly so that they could wedge in the adapter card. This, and the loosely fitted CPU fan that did not completely cover the processor, may limit the life of the system.

On the plus side, Protek has plumped for a 466MHz Celeron processor, a full 128Mb of system memory, and a 16Mb ATi Xpert 128 graphics card. This impressive combination results in one of the top system performances in this group.

A substantial 10Gb Fujitsu hard disk is provided, with an internal Zip 100 drive as removable backup support. There's a 10Mbit PCI network card, and a 56K ISA modem for internet access.



The Mag Innovision monitor yet again shows that good-quality components have not been compromised by a tight budget. It displays bright and vibrant colours with an 85Hz refresh rate at 1024 x 768. The OSD, controlled by a one-finger dial, is a breeze to negotiate, and the graphical indicators make optimisation easy.

PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *Protek (Europe) 0870 44 20 888 www.protek-europe.com*
Good Points *Impressive array of components.*
Bad Points *Worrying construction details.*
Conclusion *Impressive performance, but construction may affect reliability.*

Build Quality	★
Performance	★★★★
Value for Money	★★★★★
Overall Rating	★★★

Simply Soho

Simply submitted a system based on Intel's Whitney chipset and followed up with some well-balanced components. The integrated graphics is bolstered with a full quota of 128Mb system memory and a 466MHz Celeron. In addition, Simply has taken advantage of the Whitney's UDMA66 support with a respectable 8.4Gb Quantum hard disk. The enhanced data transfer protocol will improve performance over long sequential data transfers.

Whitney's integration has left the AOpen motherboard with only three PCI slots, and Simply has placed a 56K modem in one, rather than opting for the available Audio Modem Riser slot.

Access to the interior of the machine is via a single side-panel and reveals cables in disarray. Upgrade options are limited to one 3.5in and one 5.25in device bay, but a plate across the top length of the case restricts cable access to the 5.25in bay. One option not easily available is any future upgrades to a Slot 1 processor, as the choice of board supports only a Socket 370 PPGA processor.

A 40X Philips CD-ROM and some simple but effective Philips compact speakers complete the system package.

The monitor, also from Philips, raised some concerns. Although 800 x 600 is a generally accepted working resolution for a 15in, you may still prefer the option of running at a higher resolution in order to fit more on-screen, useful when running multiple applications or when doing graphics work. However, this monitor only supports a refresh rate of 60Hz at 1024 x 768. This, coupled with unremarkable colour representation and poor sharpness, make this a less than ideal display.

PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *Simply 08707 297366 www.simply.co.uk*
Good Points *Respectable performance. Balanced components.*
Bad Points *Poor monitor.*
Conclusion *Worth considering if you replace the monitor.*

Build Quality	★★
Performance	★★★★
Value for Money	★★★
Overall Rating	★★★

Time 466t SV

Time opted for a case similar to Protek's, but avoided the construction problems by placing a Socket 370 processor directly onto the motherboard. Rather than an integrated-chipset solution, with the option of a lower-profile system, the company provided some good-quality alternative components in a larger case.

The fastest Celeron featured in this group test, the 466MHz processor is supported by 64Mb of PC100-specified system memory. As the Celeron only supports a front-side bus speed of 66MHz and the processor cannot be upgraded to a PII or PIII, there is currently no way of taking advantage of the 100MHz compliant memory.

The system features Creative Labs' excellent SoundBlaster Live! Value sound card, driving a pair of underachieving Sound Force 550 speakers. Selecting Creative's TNT-based Blaster graphics card was a brave choice considering its age: the good performance results are a testament to how far ahead of the competition this card was a year ago.

Remove six screws and the whole case can be lifted off. The combination of a wide case and flipping the power supply unit on its side allows the processor and memory to be accessed from the top of the system with ease. With ample slots and bays, various upgrade options are available to the user; except, of course, you will have to stick with the Socket 370-based Celeron releases.

The rebadged CTX monitor packs a vivid image, although it lacks overall sharpness with further deterioration towards the screen edges. At 1024 x 768 the refresh rate is just 60Hz. The colourful OSD provides an easy route to obtaining the best the screen can offer.

PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *Time Computer Systems 01282 777555 www.timecomputers.co.uk*
Good Points *Good multimedia setup.*
Bad Points *Poor monitor.*
Conclusion *Too much emphasis on games at the expense of the monitor.*

Build Quality	★★★
Performance	★★★
Value for Money	★★★
Overall Rating	★★★

Watford Aries 6100

Watford did not supply the fastest Celeron available. However, the 433MHz that was used is not something we could complain about, especially when the money saved has been spent elsewhere with such aplomb. The Socket 370 to Slot 1 adapter card opens up the upgrade path immensely, not only to the Pentium II but to the Pentium III as well, thanks to the Slot 1 BX motherboard.

At 64Mb system memory could initially be considered as reserved, but in fact, the money saved may have enabled Watford to select a 16Mb Voodoo3 2000 to power its graphics sub-system. All areas of use are addressed admirably, with options to support higher resolutions for future monitor upgrades.

Creative's SoundBlaster 64 Value card may not be up to the Live!'s standard, but for this system's intended use, the quality of reproduction is perfectly adequate although let down somewhat by the bundled Maxxtro speakers. A PCI version of a 56K modem and a 40X CD-ROM drive complete the package, along with a sizeable 10Gb of IBM hard-disk storage.

Access is provided via one side-panel, giving an insight into more Watford future-proofing. With front access for all the vacant bays — one 3.5in and two 5.25in — and two ISA and two PCI slots, you'll be pretty well covered when you take the plunge into adapting your system for more demanding uses.

EDITOR'S CHOICE PERSONAL COMPUTER WORLD

The AOC monitor is a delight. The100Hz refresh at 800 x 600 contributes to a sharp and clear image right up to the bezel. Colour reproduction is warm and bright, with the dial-controlled OSD allowing for intuitive screen optimisation in no time at all.

PCW DETAILS

Price *£699 (£594.89 ex VAT)*
Contact *Watford Aries 0800 035 5555 www.watford.co.uk*
Good Points *Good graphics and monitor.*
Bad Points *On balance, there's none worth highlighting.*
Conclusion *Good-quality system with ample upgrade options.*

Build Quality	★★★★★
Performance	★★★★
Value for Money	★★★★
Overall Rating	★★★★

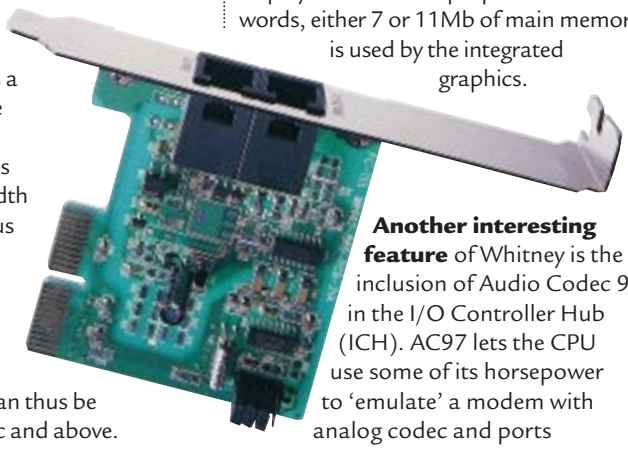
Integrated Graphics and Analogue Modem Riser cards

In last month's PCW we outlined the features of Intel's up-and-coming 810 (Whitney) chipset, an interesting hybrid that integrates graphics, sound, and the digital functions of a modem, among other features. Although in the long term this chipset limits your upgrade options, in the short term there are some merits to vendors choosing this particular integrated solution.

Where vendors have opted for a Celeron processor, PC100 memory has been provided regardless of the 66MHz CPU front-side-bus speed. This is because the integrated graphics engine uses main memory for the frame, texture and Z-buffer, via the Graphics and Memory Controller Hub (GMCH) on a separate Direct AGP bus running at the full 100MHz.

This is in stark contrast to the Unified Memory Architecture (UMA) utilised in the system supplied by A-Class for this group test [*p137*], where the integrated video allocates the required frame buffer via a slower 66MHz-memory access.

Where previous integrated graphics solutions have had access to separate video memory on the motherboard, in Whitney's case this is in fact used as a display cache for the Z-buffer. Curiously, the display cache bus has half the bandwidth of the Direct AGP bus at only 400Mb/sec. By contrast, the Z-buffer of a normal 3D card resides within its local memory and can thus be as high as 3.2Gb/sec and above.

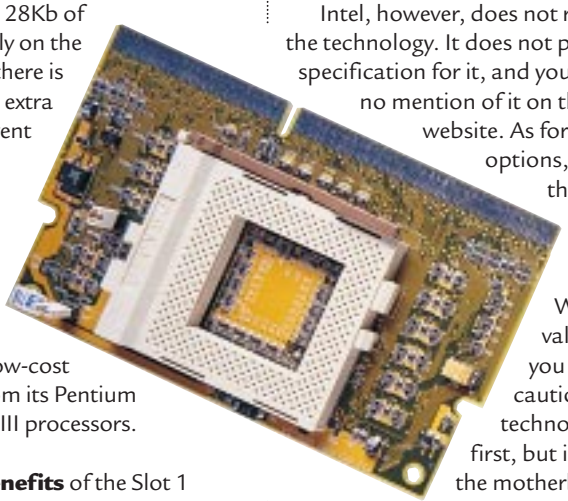


Allocation of system memory begins at bootup with the graphics controller of the i810 reserving 1Mb for the basic display buffer. As soon as a GUI operating system runs, the graphics controller requires 4Mb for the frame buffer, 2Mb of command buffer and 4Mb of Z-buffer, unless the system is equipped with the 4Mb of external display cache for this purpose. In other words, either 7 or 11Mb of main memory is used by the integrated graphics.

Another interesting feature of Whitney is the inclusion of Audio Codec 97 in the I/O Controller Hub (ICH). AC97 lets the CPU use some of its horsepower to 'emulate' a modem with analog codec and ports externally, through Analogue Modem Riser cards slotted into a new port about an inch long, positioned where you would expect to see an AGP slot. These devices are not active, so for full voice functionality as well as a 56K modem, you'll be putting the strain onto the CPU.

Socket 370 to Slot 1 adapter cards

Intel's launch of the 466MHz Celeron processor spelt the end of the Slot 1 Celerons. All future Celerons will be Socket 370 PPGA processors only. With the Celeron line incorporating 128Kb of L2 cache directly on the processor die, there is no need for the extra material that went into the slot cartridge. However, it could also be said that this is an easy way for Intel to segregate the low-cost Celeron line from its Pentium II and Pentium III processors.



One of the benefits of the Slot 1 Celerons was their slot compatibility with Pentium II and III CPUs: new Socket 370 motherboard architectures severely limit the upgrade path. But several motherboard manufacturers saw that their customers would want to upgrade in future, and as a result they developed a 'Socket-370 to Slot-1 Adapter', or Slocket for short.

Intel, however, does not recognise the technology. It does not provide a specification for it, and you will find no mention of it on the Intel website. As for upgrade options, Intel states that there will always be faster Celerons. Without Intel validation, you may be cautious of the technology at first, but in fact the motherboard manufacturers are just extending their architecture upwards.

Since the Socket 370 is aimed at the entry-level market, the supporting motherboards are built under less stringent conditions. With a Slocket you can use the cheapest processor on the market and benefit from a tried and tested platform with good-quality constructions.

A Socket 370 derivative of a Slot 1 design is not just a matter of fitting the socket where the slot was designed to be. The design of the board must be optimised to ensure that trace and lead distances remain within tolerances.

This brings into question the Slocket design — does incorporating the CPU on a board introduce excess trace distance between the CPU and the motherboard as the physical data-path is increased?

Extensive tests show without a doubt that no noticeable drop in performance can be accredited to the use of adapters. In fact some adapters allow jumper based voltage tweaking to assist in stabilising overclocking to offer even greater performance.

Table of features




Manufacturer	A Class	Big Red	Carrera	DCS	Dotlink
Model Name	**A6**	**Mercury 350/3D**	**Lynx W466**	**Solo DVD**	**Charisma 400 Pro**
Price (inc VAT)	£699	£699	£699	£699	£699
Price (ex VAT)	£594.89	£594.89	£594.89	£594.89	£594.89
Telephone	0181 324 1699	08700 711 117	0181 307 2800	0121 414 7575	0181 902 5802
Fax	0181 324 1468	08700 733 337	0181 307 2857	0121 414 7565	0181 903 6508
URL	www.a-class.net	www.bigred.co.uk	www.carrera.co.uk	www.dcsplc.co.uk	www.dotlinkpc.com
Hardware Spec					
Processor	Intel Pentium III 450MHz	AMD K6-2 350MHz	Intel Celeron 466MHz	Intel Celeron 433MHz	Intel Celeron 400MHz
RAM / type	128Mb PC100 SDRAM	64Mb PC100 SDRAM	64Mb PC100 SDRAM	64Mb PC100 SDRAM	64Mb PC100 SDRAM
CPU front-side-bus clock	100MHz	100MHz	66MHz	66MHz	66MHz
Occupied / free RAM slots	2/1	1/2	1/1	1/2	1/2
Hard disk	Maxtor DiamondMax 4320	Fujitsu MPC3065AH	IBM Deskstar 14 GXP	Fujitsu MPC3064AT	W.Digital Caviar 28400
HD size / interface	8.4Gb / EIDE (UDMA33)	6Gb / EIDE (UDMA33)	10Gb / EIDE (UDMA66)	6.4Gb / EIDE (UDMA33)	8Gb / EIDE (UDMA33)
Motherboard	PC100 SystemBoard M741	Gigabyte GA-5AX 4.1	SuperMicro 370swd	Jetway J-7BXAS 2.1	EliteGroup P6BXT-A+ 1.1
Chipset	SiS620	Ali M1533 & M1541	Intel (Whitney) 810	Intel 440BX	Intel 440BX
L2 cache	512kb (1/2 Core speed)	512kb (100MHz)	128kb (Core speed)	128kb (Core speed)	128kb (Core speed)
3.5 / 5.25in bays	3/2	3/3	1/2	3/3	3/3
PCI / ISA / shared slots	0/0/1	4/1/1	3/0/0 +1AMR SLOT	4/2/0	3/1/1
USB / Serial / Par / PS2 ports	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2
Multimedia					
CD-ROM manufacturer	Actima	Raite Optoelectronics	LG Electronics	Samsung	LG Electronics
CD-ROM model	AD06P	DVD-ROM RDR-102H	CRD-8400C	DVD-ROM D605	CRD-8400B
CD-ROM speed / interface	6xDVD, 32xCD/EIDE	2xDVD, 24xCD/EIDE	40x/EIDE	5xDVD, 24xCD/EIDE	40x/EIDE
Sound-card manufacturer	C-Media	Creative	Analogue Devices	Ensoniq	C-Media
Sound-card model	CMI8338 C3DX Integrated	SoundBlaster 64V PCI	SoundMax Int Dig Audio	ESS Solo-1 Integrated	CMI8338/C3DX Integrated
Speakers	CNJ MS695	Big Red AT95	Altec Lansing ACS43	25W Typhoon	Phillips MMS110
Graphics card	SiS 620 Integrated	Diamond Viper V550	Intel i752 Integrated	ATI Xpert98	ATI Xpert 128
RAM	8Mb system memory allocation	16Mb	11Mb (4Mb display cache, 7Mb system memory)	8Mb	16Mb
Max RAM / type	8Mb / SDRAM	16Mb / SDRAM	11Mb / SDRAM	8Mb / SGRAM	16Mb / SDRAM
Graphics card interface	AGP2X	AGP2X	GMCH	AGP2X	AGP2X
Monitor	Proview 564DM	Viewsonic E655	LG Electronics/57i	Belinea 10 20 10	Hansol Mazellan 501P
Monitor size / max view diag	15in / 13.7in	15in / 13.8in	15in / 13.8in	15in / 13.8in	15in / 13.8in
Max refresh rate at 800 x 600	85Hz	100Hz	85Hz	85Hz	100Hz
Max refresh rate at 1024 x 768	75Hz	85Hz	85Hz	60Hz	85Hz
Max refresh rate at 1280 x 1024	n/a	60Hz	60Hz	n/a	60Hz
Other Information					
Modem	HSP Audio Modem Riser 56	Rockwell V.90 PCI	Rockwell V.90 PCI	Rockwell V.90 PCI	Rockwell V.90 PCI
Modem standard	56K	56K	56K	56K	56K
Misc hardware	Davicom 9102 Integrated NIC 10/100Mbit, Slot 1 & Socket 370 Mboard			Socket 370/Slot 1 adaptor	Realtek RTL8139(A) PCI NIC 10/100Mbit Slot 1 & Socket 370 Mboard
Bundled software	Gamut98 MP3 Playback	Lotus SmartSuite Millennium, World Book 99 DO$H Cashbook	Lotus SmartSuite Millennium World Book 99	Lotus Smartsuite Millennium	Lotus SmartSuite 97, World Book 99
Standard warranty	1yr on-site, 3yrs RTB p&l	5yrs, 1st yr on-site p&l, 2 - 5yrs RTB labour only	1yr RTB parts & labour, 2 years labour RTB	5 Yrs RTB, 1st yr p&l, 4 yrs labour only	3yrs, 1st yr RTB p&l, 2 & 3 RTB labour only
Warranty options	3yr on-site £69	2 & 3 yrs on-site - £189	Up to 3yrs on-site	Please call	1yr on-site £29, 3yr on-site £99
Sales hours	9.30-6 Mon-Sat	9-6 Mon-Fri	9-6 Mon-Fri, 10-4 Sat	9-5.30 Mon-Fri, 10-4 Sat	9.30-6 Mon-Fri, 11-2 Sat
Technical support hours	9.30-5.30 Mon-Fri	9-6 Mon-Fri	9-6 Mon-Fri, 10-4 Sat	9-5.30 Mon-Fri, 10-4 Sat	9.30-6 Mon-Fri

Key: GMCH - Graphics and Memory Controller Hub

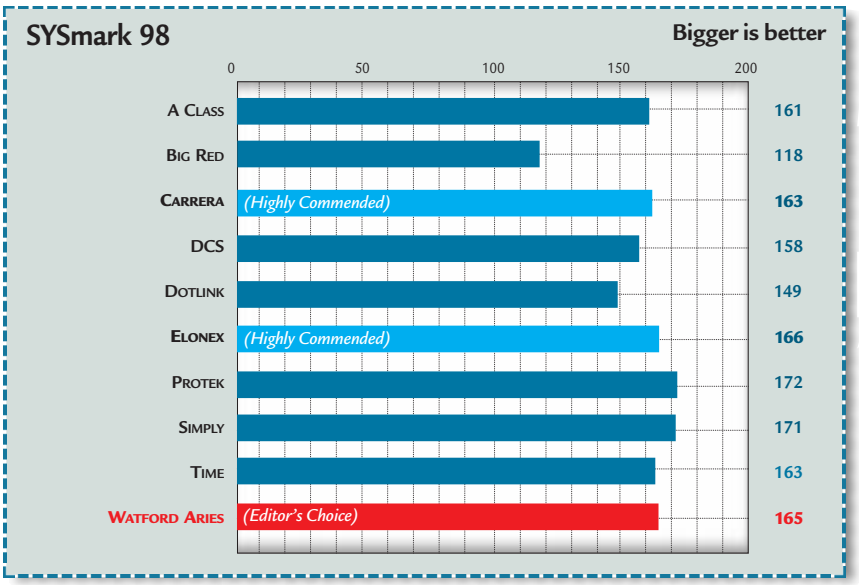
Table of features




Manufacturer	Elonex	Protek	Simply	Time	Watford Aries
Model Name	**MCX-6466/I**	**UltraMX**	**Simply Soho**	**466T SV**	**6100**
Price (inc VAT)	£699	£699	£699	£699.13	£699
Price (ex VAT)	£594.89	£594.89	£594.89	£595.00	£594.89
Telephone	0181 452 4444	0870 44 20 888	08707 297366	01282 777 555	0800 035 5555
Fax	0181 452 6422	01884 822301	08707 274002	01282 77 08 44	0870 729 5648
URL	www.elonex.co.uk	www.protek-europe.com	www.simply.co.uk	www.timecomputers.co.uk	www.watford.co.uk
Hardware Specs					
Processor	Intel Celeron 466MHz	Intel Celeron 466MHz	Intel Celeron 466MHz	Intel Celeron 466MHz	Intel Celeron 433MHz
RAM / type	128Mb PC100 SDRAM	128Mb PC100 SDRAM	128Mb PC100 SDRAM	64Mb PC100 SDRAM	64Mb PC100 SDRAM
CPU front-side-bus clock	66MHz	66MHz	66MHz	66MHz	66MHz
Occupied / free RAM slots	1/1	1/1	1/1	1/2	1/2
Hard disk	Fujitsu MPC3084AT	Fujitsu MPC3102AT	Quantum Fireball CR	IBM DHEA-38451	IBM DTTA-371010
HD size / interface	8.4Gb / EIDE (UDMA66)	10.2Gb / EIDE (UDMA33)	8.4Gb / EIDE (UDMA66)	8.4Gb / EIDE(UDMA33)	10.1Gb / EIDE (UDMA33)
Motherboard	SuperMicro 370SWD 2.0	PC100 SystemBoard M761	AOpen MX3W	ABIT AB-BM6	Gigabyte GA-6BXE
Chipset	Intel (Whitney) 810	Intel 440BX	Intel (Whitney) 810	Intel440BX	Intel 440BX
L2 cache	128kb (Core speed)	128kb (Core speed)	128kb (Core speed)	128kb (Core speed)	128kb (Core speed)
3.5 / 5.25in bays	3/2	3/3	3/2	4/3	3/3
PCI / ISA / shared slots	3/0/0 +1AMR SLOT	2/0/1	3/0/0 +1AMR SLOT	4/1/1	3/2/1
USB / Serial / Par / PS2 ports	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2
Multimedia					
CD-ROM manufacturer	Acer	Samsung	Phillips	LG Electronics	Creative
CD-ROM model	64A-103	SC-140B	PCA402CD	CRD-8322B	BCD-40XH
CD-ROM speed / interface	40x/EIDE	40x/EIDE	40x/EIDE	32x/EIDE	40x/EIDE
Sound-card manufacturer	Analogue Devices	PCI on-board	Analogue Devices	Creative	Creative
Sound-card model	SoundMax Int Dig Audio	CMI 8338/C3DX chipset	SoundMax Int Dig Audio	SoundBlater Live! Value	SoundBlaster 64V PCI
Speakers	Creative CSW20	Juster AC-691N	Phillips MMS110	Sound Force 550	Maxxtro SPK306
Graphics card	Intel i752 Integrated	ATI Xpert 128	Intel i752 Integrated	Creative Blaster Riva TNT	VooDoo3 2000
RAM	11Mb (4Mb display cache, 7Mb system memory)	16Mb	11Mb (4Mb display cache, 7Mb system memory)	16Mb	16Mb
Max RAM / type	11Mb / SDRAM	16Mb / SDRAM	11Mb / SDRAM	16Mb / SDRAM	16Mb / SDRAM
Graphics card interface	GMCH	AGP 2X	GMCH	AGP2X	AGP2X
Monitor	TVM MN024/H	MAG Innovision XJ530	Phillips/105E	CTX/1555E	AOC/Spectrum 5Glr
Monitor size / max view diag	15in / 13.8in	15in / 13.9in	15in / 13.8in	15in / 13.8in	15in / 13.8in
Max refresh rate at 800 x 600	85Hz	100Hz	85Hz	85Hz	100Hz
Max refresh rate at 1024 x 768	85Hz	85Hz	60Hz	60Hz	75Hz
Max refresh rate at 1280 x 1024	60Hz	60Hz	n/a	n/a	60Hz
Other Information					
Modem	Intel riser card	Motorola SM56 ISA	Rockwell V.90 PCI	Etech PCI 56RVP	Rockwell V.90 PCI
Modem standard	56K	56K	56K	56K	56K
Misc hardware	Joystick	Realtek PCI NIC 10Mbit, Socket 370/Slot 1 adaptor Iomega Zip		QuickShot Command Pad, Time Joystick	Socket 370/Slot 1 adaptor
Bundled software	MS Works 4.5, Age of Empires, Cart Precision Racing, Flight Sim 98		Lotus SmartSuite 97	Lotus SmartSuite Millennium, 10 CDs & 6 game bundle	
Standard warranty	1 yr RTB parts & labour	5 yrs - 1yr CAR p&l, 4yrs labour only	5yrs RTB 1yr parts & labour	1yr RTB	6 yrs, 1st yr CAR p&l, 5yrs labour only
Warranty options	£30 onsite for first year, £61 for onsite years 2+3	Please call	1yr on-site £39, 3yr on-site £170	3 & 5 yrs RTB	3yrs on-site £99
Sales hours	9-5.30 Mon-Fri, 9-1Sat	9-6 Mon-Sat	8-8 M-F, 9-6 Sat, 10-4 Sun	8.30-7.30 M-F, 10-4 St + Sn	9-7 Mon-Fri, 9-6 Sat
Technical support hours	8-8 Mon-Fri, 9-1Sat	9-6 Mon-Sat	9-6 Mon-Fri	8-8 Mon-Fri, 9-5 Sat/Sun	9-7 Mon-Fri, 10-4 Sat

Key: GMCH – Graphics and Memory Controller Hub

PCW Labs Report



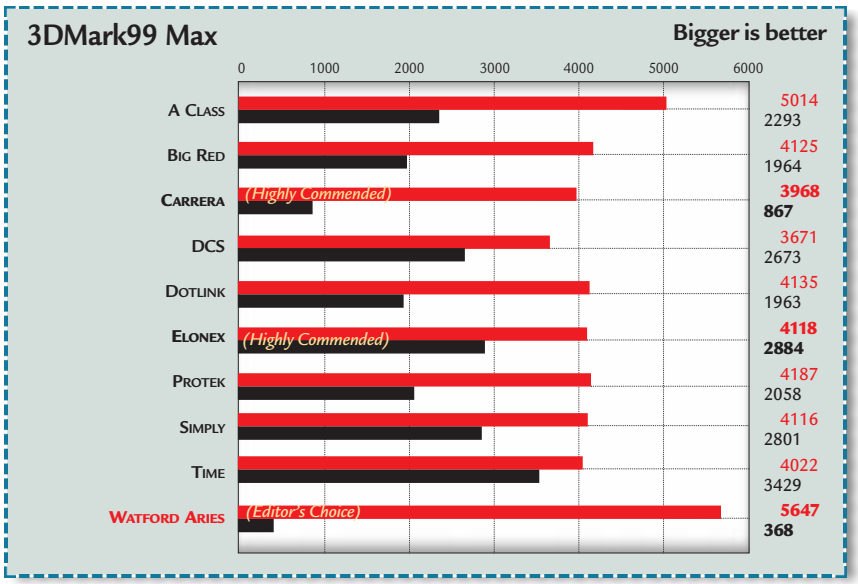
Protek provided the top-performing system under this test, with Simply running a very close second. With only the graphics sub-systems differing, it was encouraging to see Intel's variation on integrated graphics proving its worth against the excellent ATi Xpert 128 sported by the Protek. Carrera also provided Intel i752 integrated graphics, but dropped a few points by halving the system memory.

The lowest performance returned was that of the Big Red system, which could be attributed to a combination of a slow processor and half the system memory of the top achievers. The Diamond Viper V550 didn't help matters either. Although it was cutting edge a year ago, it's showing its age now.

With requirements for 3D support becoming more commonplace in everyday applications, taking up the processing via a decent graphics sub-system is a serious consideration.

The results returned for the A-Class and the DCS systems for overall performance presented grave concerns. Considering that a portion of the scoring system under this test is attributed to specific types of 3D processing support, these systems' overall scores highlighted that some support was lacking. The score for CPU geometry speed shows that the A-Class will clearly be borrowing from its Pentium III's excellent maths co-processor.

The Watford Aries system proved that a quality card like the Voodoo3 can be afforded without too heavy a cut on CPU speed or system memory.



How we did the tests

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

Office Productivity: CorelDraw 8, Microsoft Excel 97, Dragon Systems NaturallySpeaking 2.02, Netscape Communicator 4.05 Standard Edition, Caere OmniPage Pro 8.0, Corel Paradox 8, Microsoft PowerPoint 97, and Word 97.

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

Performance depends on processor speed, RAM, graphics card and disk I/O. As 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 PCs' 3D capabilities. When applicable, the suite of tests will draw upon AMD's 3DNow! or Intel's KNI instruction sets.

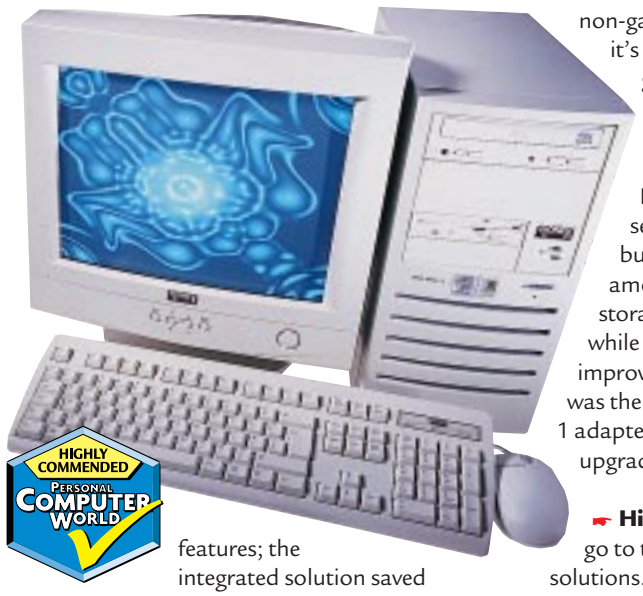
It uses a Real World DirectX 6.1 3D games engine to produce one result from a balanced testing methodology that includes image quality, rendering speed, CPU capability and, depending on hardware support, a test for embossed bump-mapping.

All 3DMark99 Max benchtests are performed at a resolution of 1024x768 in 16-bit colour depth, with the test suites set to loop three times. Again, the higher the score, the better the result. However, 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.bapco.com and www.3dmark.com

Editor's Choice

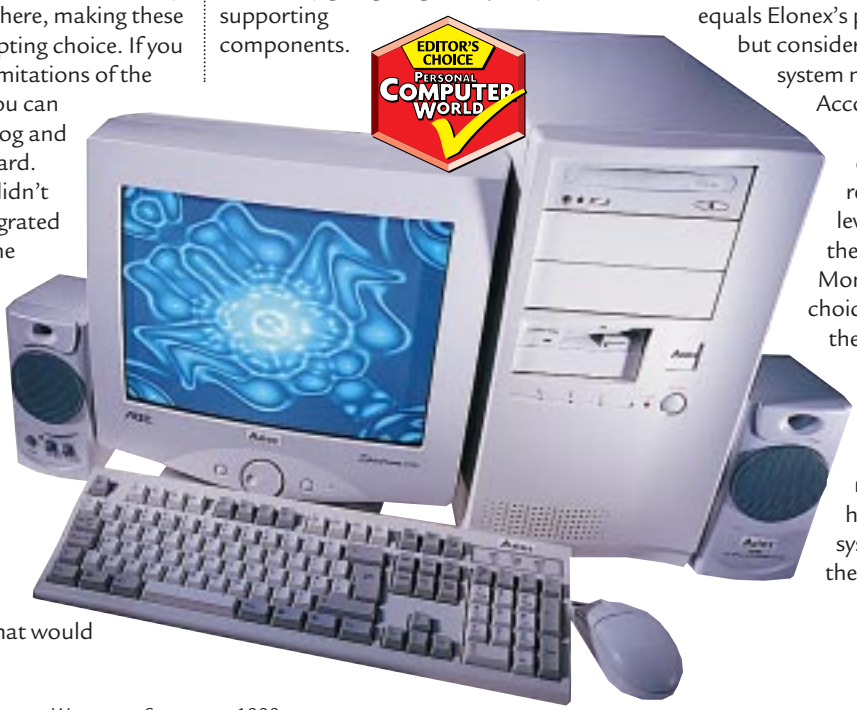
We know that our readers like to upgrade to bigger, better and faster components as and when they're available, price permitting. The trend for integrating peripherals into the core logic of a computer system is a concern in that it takes away a certain amount of scope for upgrading, lumbering you with what will soon be outdated technology. That said, those vendors which opted for Intel's integrated solution made the most of possible enhancements to the chipset's features; the integrated solution saved money, but the enhancements still provided good performance. The money saved was spent elsewhere, making these budget systems a tempting choice. If you do grow tired of the limitations of the integrated chipsets, you can always go the whole hog and replace the motherboard.

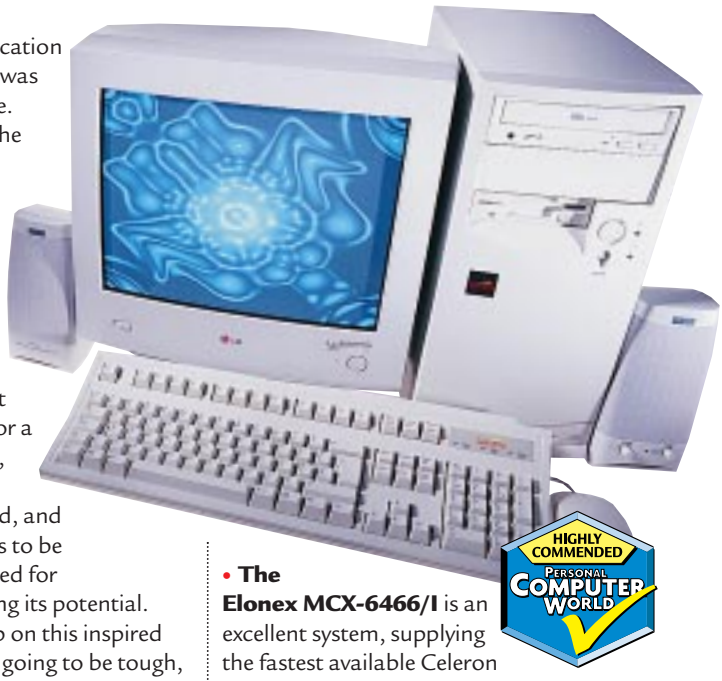


The vendors that didn't opt for the cheap integrated solutions fell foul of the cost implications and mostly suffered at some point, trying to provide consistent quality components.

Editor's Choice goes to Watford Electronics for its Aries 6100, the ideal solution. Watford's ability to specify components that would provide instant gratification *and* the upgrade path was particularly impressive. The Voodoo3 2000, the low-end model in the Voodoo3 graphics card family, is frequently overlooked, considered by many to be too low specified for the serious gamer and not sufficiently featured for a non-gamer. In fact, it's a very good graphics card, and Watford is to be commended for championing its potential. Following up on this inspired selection was going to be tough, but Watford applied just the right amount of focus on performance, storage and display requirements while leaving scope for future improvement. The icing on the cake was the choice of a Socket 370 to Slot 1 adapter card, making it possible to upgrade to a Slot 1 processor.

Highly Commended awards go to two of the integrated peripheral solutions. They take maximum advantage of the cost savings this offers, the money going on good-quality supporting components.





- **The Elonex MCX-6466/I** is an excellent system, supplying the fastest available Celeron processor at 466MHz with 128Mb of system memory. Overall construction is sound, with the Elonex-branded monitor capable of displaying a range of resolutions at a respectable quality.

An innovative approach to the hardware configuration enables full support for Intel's instantly available PC initiative, and this is the only system to sport the new Analogue Modem Riser card rather than waste a PCI slot on a modem.

- **Carrera, with its Lynx W466,** equals Elonex's processor provision but considers only 64Mb system memory sufficient. According to our performance tests, designed to represent today's level of applications, they're not far wrong. Money saved on this choice could be spent on the slightly increased storage over the Elonex system. On balance, though, the quality monitor is what helped push this system through to the awards ceremony.