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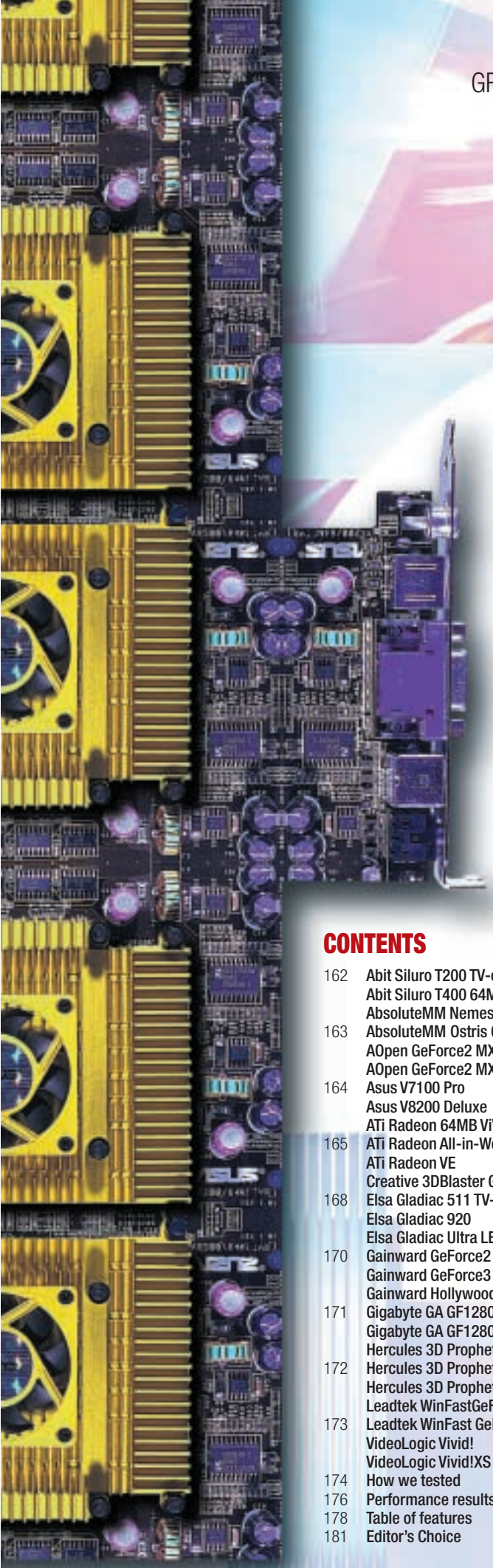

Graphics galore

Graphics cards can cost more than a CPU these days and most of them work hard for the money, but choosing which one to buy is not easy. We've gathered together a massive 27 cards to help you make your decision

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The PC is made up of many components, with the most important traditionally being the central processing unit (CPU). The reason for this is that, as the name suggests, the CPU is the centre of the computer where the majority of the work is done. However, this changed over the past few years as the PC became more of a games platform. When 3D games started to appear it soon became apparent that the CPU was struggling under the pressure of the intensive geometry calculations and rendering. It wasn't long before graphics card manufacturers started to produce boards that could render 3D scenes and take the load off the CPU. Of course the CPU still had to calculate the geometry for the 3D scene, so the speed of the graphics card was still directly related to the speed of the CPU. Now, however, graphics cards can actually perform much of the geometry calculations too, taking almost all the load from the CPU and in some respects making the term CPU a bit of a misnomer when running 3D applications.

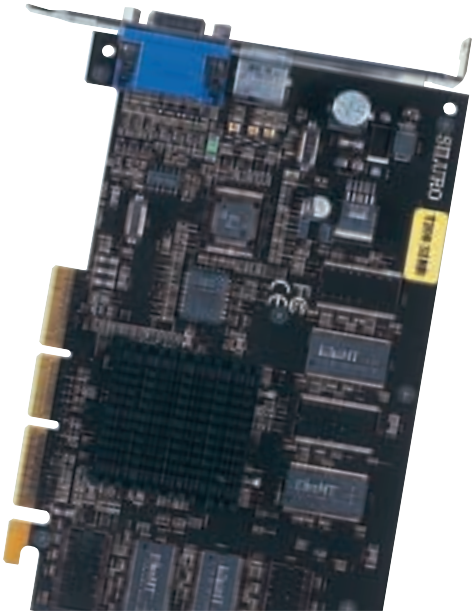
So, since the graphics card has become such an important part of the PC configuration we decided to round up as many as we could find and run them through a rigorous set of benchmarks.

Graphics cards can cost even more than your CPU these days and which one you buy should not be a snap decision. So, to help you make your choice, we've tested 27 of the latest 3D accelerators.

And don't forget to read this month's *pcwexpert*, starting on page 187, for an in-depth insight into graphics cards.

Abit Siluro T200 TV-out

PRICE £68.15 (£58 ex VAT) **CONTACT** Abit 01438 228 888 www.abit.nl
PROS Price; TV-out; good manual **CONS** Poor 3D performance
OVERALL A reasonable card for the price, but not for the gamer
SCORE



Abit is more well known for its motherboards than its range of graphics cards, although it has been making graphics cards for a while now. The Siluro T200 is the entry-level card in Abit's range and its performance in our benchmarks confirms this as it shares bottom place with the MX 200 cards from Gigabyte and AOpen.

The card is based on the new nVidia GeForce2 MX 200 chip, which only has half the memory bandwidth of its bigger brother the MX 400. The card that we received from Abit has 32MB of graphics memory installed, as well as a TV-out connector.

There is a proprietary TV-out connector on the card and by using an adaptor you can get both S-Video and composite video outputs.

Abit also bundles an S-Video cable and a copy of WinDVD with the Siluro so it can be used for DVD playback on a suitable TV.

As always, Abit provides an excellent manual with this card that covers every aspect of installation and the accompanying software.

Unfortunately, the gaming performance of the T200 is a little disappointing, but if you are looking for a cheap card for occasional gaming and need TV-out, then this might just be worth a look.

Abit Siluro T400 64MB TV-out

PRICE £86.95 (£74 ex VAT) **CONTACT** Abit 01438 228 888 www.abit.nl
PROS TV-out; manual **CONS** Kyro-based cards offer better value for money
OVERALL A reasonable card, but we'd rather go for a Kyro or even Kyro II-based solution
SCORE

The Siluro T400 is the T200's big brother in every respect, offering a full 64MB of graphics memory as well as the GeForce2 MX 400 chipset with 128bit data path between the GPU and the memory.

This card doesn't differ in any other way from the T200 and offers the same TV-out functionality, as well as coming with the same set of cables and the excellent manual and software bundle.

As this is the high-end model it performs much better then the T200. The performance is about average compared to the other 64MB MX 400 cards. It does also outperform the similarly priced ATi Radeon VE in most of our benchmarks. It is interesting to see that the cards based on the MX 400 chip with 64MB of memory manage to run 3DMark 2001 at a resolution of 1,600 x 1,200, whereas the 32MB versions cannot.

Our only reservation when it comes to recommending any card based on nVidia's latest incarnation of the GeForce2 MX, would be the stiff competition it is getting from the now one-year-old Kyro chipset, as this manages to outperform the MX 400 in most circumstances, although it is £25-£35 cheaper.

Overall the Siluro T400 is a reasonable card but it is relatively pricey.

AbsoluteMM Nemesis MX 400

PRICE £99.99 (£84.25 ex VAT) **CONTACT** 3DPower 01252 820 841 www.3dpower.com
PROS Good for the overclockers **CONS** Not as good as the Vivid!XS
OVERALL Yet another card that loses out on price/performance to the Kyro II
SCORE

Absolute Multimedia might not be the most well-known graphics card manufacturer out there, but it has been producing retail cards for a few years now. The company was recently acquired by 3DPower but Absolute Multimedia is still being used as the brand name for its retail graphics cards. You can find these boards in shops such as Electronics Boutique.

The Nemesis 400 is yet another card based on nVidia's GeForce2 MX 400 chipset. The Nemesis looks cool as it's made out of a black PCB (printed circuit board) with gold heatsinks on the memory chips.

Sadly, underneath all the glamour is just another MX 400 card that offers little extra to beat off the competition.

Absolute Multimedia has included 64MB of graphics memory, but no TV-out or any other features. We presume that the Nemesis is geared towards the overclocker as the heatsinks on the memory chips are completely redundant on any MX 400 cards. Another hint is the power connector for an optional fan. As with the other MX 400 models we find it hard to believe anyone will spend close to £100 for this when you can get the Vivid!XS from VideoLogic for a similar price, or the even cheaper Vivid!.

AbsoluteMM Ostris GeForce2 Ultra

PRICE £269 (£229 ex VAT) **CONTACT** 3DPower 01252 820 841 www.3dpower.com
PROS A respectably fast card; decent price for an Ultra **CONS** A Kyro II card is better value
OVERALL If you're after speed, saving a bit more cash for a GeForce3 may be a better bet
SCORE

The second entry from Absolute Multimedia is quite a different animal from the Nemesis MX 400, as it's based on the much faster GeForce2 Ultra chip from nVidia. The card itself differs little from any other GeForce2 Ultra that we have seen, except that Absolute Multimedia has gone for a round heatsink/fan combination on the GPU (graphics processing unit), rather then the square reference design that most other manufacturers opted for, but retains the standard green memory heatsinks.

There is also an S-Video connector on a small riser. The Ostris ships with an S-Video-to-composite converter as well as an S-Video cable, although this is a bit on the short side.

Performance-wise the Ostris is one of the faster Ultras in 3DMark 2000 and 2001, although it seems to drop a bit in the Quake III Team Arena and MDK2 tests.

Where this card really beats the competition is the price. At £269 it's £30 cheaper than Elsa's Ultra and an amazing £110 cheaper then the Creative. Overall not a bad deal, but if you compare it to the Kyro IIs from VideoLogic and Hercules, you realise that you can get very similar performance for far less money and the Gainward GeForce3 card is only £60 more.

AOpen GeForce2 MX 200-V

PRICE £66.96 (£57 ex VAT) **CONTACT** Jungle.com 0800 0355 355 www.jungle.com
PROS Price, TV-out **CONS** Poor 3D performance
OVERALL A reasonably priced low-end card, but Hercules' 3D Prophet 4000XT is a far better buy
SCORE

AOpen's budget model is the MX200-V and one could be mistaken for thinking that the V stands for value in this case, as it costs a mere £66.96 inc VAT.

AOpen offers a host of different boards based on the same design. The MX200-V sports the nVidia GeForce2 MX 200 chipset and 32MB of SDRAM, hence the low price. AOpen has, on the other hand, included an S-Video connector for Video-out and this is what the V in the model name stands for.

This board ships with one of the best manuals that we have seen in this group test. It contains everything that you could possibly want to know about your graphics card, as well as detailed installation instructions. Apart from this there's not much to distinguish the MX200-V from the rest of the pack.

The board's layout is pretty standard, the card itself is green, although AOpen has fitted a huge heatsink to the MX 200 chip that seems to be a bit over the top, but should allow for sufficient cooling.

Sadly the MX 200-V is the slowest card in all our tests and this makes it very hard to recommend. Even with the low price, the cheaper and faster Hercules 3D Prophet 4000XT is a much better proposition.

AOpen GeForce2 MX 400-A

PRICE £146.86 (£124.99 ex VAT) **CONTACT** Jungle.com 0800 0355 355 www.jungle.com
PROS Lots of features; very cheap **CONS** Poor performance
OVERALL Considering the price, this is an impressive card
SCORE

AOpen is quite a diverse company that makes all kinds of components. Without a doubt it's motherboards that have made this Taiwanese company famous, but it also does good business in optical storage and graphics cards.

The MX 400-A Video Station is another card that's following the lead ATi grabbed when it produced the All-in-Wonder series. As its name suggests the Video Station is trying to be a complete video solution. Onboard the card is a TV-tuner along with video in and out capabilities for editing your home movies. On the backing plate you'll find an aerial socket for the TV-tuner, audio in and out, a D-SUB connector and a socket for a splitter that adds composite and S-Video in and out.

Beating at the heart of the Video Station is an nVidia GeForce2 MX 400 chipset backed up by 32MB of memory.

Performance is similar to the Gainward Hollywood/MX card, including the inability to run 3DMark 2001 at 1,600 x 1,200.

Although the Video Station is neither as fast nor feature rich as the award-winning ATi All-in-Wonder Radeon, it is over £100 cheaper. So, if you're after an all-in-one card and you're on a tight budget, the Video Station is worth a look.

Asus V7100 Pro

PRICE £105.75 (£90 ex VAT) **CONTACT** Dabs 0870 429 3120 www.dabs.com
PROS Fast for a 32MB card; TV-out **CONS** Still beaten by the Kyro cards
OVERALL Yet another MX 400 board that can't compete with the Kyro-based competition
SCORE

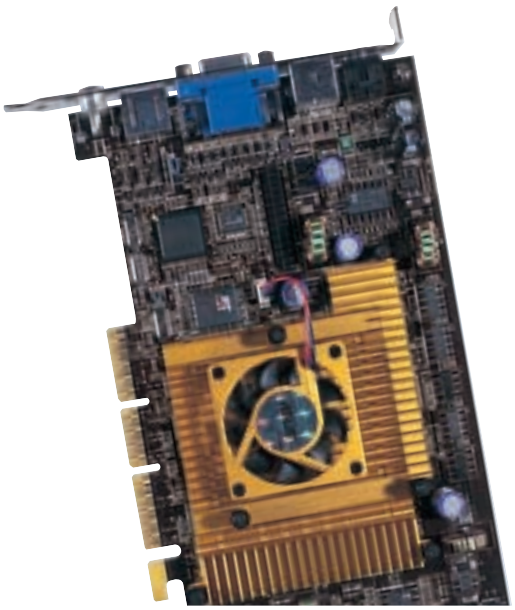
Asus is probably the most well-known motherboard manufacturer that has also built a reputation for making excellent graphics products. The V7100 Pro is one of the midrange models, although it is one of the fastest in this price range.

Based on the nVidia GeForce2 MX 400 GPU it has little to offer compared to the competition this time around. The card is made out of a black and brown PCB and Asus has fitted a silver heatsink/fan assembly to the MX 400 chip. The V7100 Pro also sports 32MB of SDRAM and both a composite and S-Video connector.

What is good to see is that Asus has provided both the S-Video and composite cables for connecting the graphics card to a suitable TV or projector.

This is one of the few 32MB MX 400 cards in this group test and we were very impressed by the performance, as it managed to beat most of the 64MB models in 3DMark 2000 and 2001 tests, except when it ran out of memory at 1,600 x 1,200 in 3DMark 2001. It did a bit worse in our OpenGL tests but it is still a respectable card.

Ultimately the V7100 Pro is no match for the old Kyro and can't begin to compete with the Kyro II.



Asus V8200 Deluxe

PRICE £358.37 (£305 ex VAT) **CONTACT** Dabs 0870 429 3120 www.dabs.com
PROS Versatile GeForce3 with loads of extras **CONS** More expensive than the Gainward GeForce3
OVERALL Not the fastest GeForce3 we've seen, but offers a few extra features
SCORE

The second entry from Asus is a top-of-the-range model based on the GeForce3 GPU. This is currently the fastest 3D chipset on the market, but it does come at a very high price.

Asus has as always designed its own boards and added quite a few extra features that no company except Gainward can compete with.

The back of the card is crammed full of ports, including a VR-out for the complimentary 3D glasses, a video-in port, the regular D-SUB as well as both S-Video and composite video-out ports. Asus has also supplied an S-Video-to-composite adaptor as well as S-Video and composite video cables.

Interestingly the V8200 is using a new video encoder/decoder chip from Philips that could prove to be a bit better than previous solutions that we've seen.

Software consists of a copy of Ulead VideoStudio 4, Asus DVD 2000 and Cyberlink VideoLive Mail 4.

The card looks spectacular with the same black/brown PCB as the V7100, but Asus has fitted a gold heatsink to the GPU, while the memory also has gold heatsinks. The V8200 is a very good card, but it's more expensive than the Gainward GeForce3.

ATi Radeon 64MB ViVo

PRICE £199 (£169.36 ex VAT) **CONTACT** ATi 01628 477 788 www.ati.com
PROS Good 3D feature set, video-in and out **CONS** Not as fast as it used to be, comparatively pricey
OVERALL The competition has got too strong for the Radeon to compete in this guise
SCORE

ATi grabbed the Editor's Choice award in our last group test with this card, but a lot has happened in the graphics market since then. Not only did nVidia's GeForce2 Ultra chipset outperform the Radeon, but now the GeForce3 GPU has a fuller feature set to boot. That said, the Radeon is still an impressive card that's more than capable of dealing with today's crop of 3D games.

There's 64MB of DDR memory along with a full feature set including both a T&L (Transform and Lighting) engine and hardware environment bump mapping. The Radeon also sports the best DVD movie playback of any card here, something ATi has always done well. This card also sports video-in and out capability so it's worth considering for budding movie makers.

Performance is nothing to write home about, but it's also far from poor. The Radeon sits about mid-way on the tables, below the GeForce3s and GeForce2 Ultras. This is no problem since those cards are also more expensive, but what is concerning is that the Kyro II-based VideoLogic Vivid!XS exhibits similar performance for half the price. Of course, you are getting T&L support and video-in and out, but in the great scheme of things if it's a Radeon you want, the All-in-Wonder is a better bet.

ATi Radeon All-in-Wonder

PRICE £259 (£220.42 ex VAT) **CONTACT** ATi 01628 477 788 www.ati.com
PROS Astounding feature set; great value; DVI connector **CONS** Not the fastest card
OVERALL A superb package from ATi with every feature you could want
SCORE

ATi has built a strong reputation for itself with its All-in-Wonder cards. What you get is a complete multimedia solution in one package. The only problem with the All-in-Wonder cards of the past is that they used to be one generation behind the latest graphics chips, making them no good for gamers, no matter how much they wanted the extra functionality. ATi addressed this issue last year by releasing an All-in-Wonder based on the Radeon chipset only a few months after the initial release and the result is a superb all-round card.

Even though this version of the Radeon only sports 32MB of RAM, it doesn't make much difference to the overall performance. Besides it's the features on this card that make it special.

Impressively ATi has fitted a DVI (Digital Visual Interface) connector with a converter to switch the signal to analog for a standard monitor. It's also got a full complement of video-in and out ports and cables, as well as an onboard TV-tuner. There is little you can't do with this card. You can import movies for editing then output them, you can have a TV programme as your Windows background, or use your PC as a video recorder.

If you're looking for an all-round video solution, this is it.

ATi Radeon VE

PRICE £99 (£84.50 ex VAT) **CONTACT** ATi 01628 477 788 www.ati.com
PROS DVI and D-SUB; TV-out; all cables and adaptors supplied **CONS** Poor 3D performance; pricey
OVERALL Not a games card by any means, but an excellent solution for dual-monitor support
SCORE

ATi is one of the biggest graphics card manufacturers in the world today, but most of its products are for system integrators rather than end users.

The Radeon VE is an altogether different card from its faster, more expensive siblings, as it is geared mainly toward the business user and not so much the games player. The main reason for this is ATi's newly introduced Hydra Vision. This is like the Matrox Dual Head technology and can do very similar tricks. This is where the business part comes in as the card has been fitted with a D-SUB as well as a DVI connector. ATi has also supplied a DVI-to-D-SUB converter for those users who want to use the Radeon VE with two conventional monitors.

There is also an S-Video connector for presentations or similar uses. ATi is well-known for supplying all the cables to connect the card to a TV or a projector.

The VE is based on a cut-down version of the Radeon chipset, running slower and with 32MB of standard SDRAM rather than DDR SDRAM. 3D performance is lacklustre, on the other hand, roughly on a par with the slower MX 400-based cards, but we doubt that this would be important to the kind of user who would buy the VE.

Creative 3DBlaster GeForce2 Ultra

PRICE £375 (£319.15 ex VAT) **CONTACT** Creative 0800 973 069 www.europe.creative.com
PROS Good overall performance **CONS** Too expensive; no outputs
OVERALL A high price to pay for an older chipset, there are better deals elsewhere
SCORE

With a price tag of £375 inc VAT, you might question whether it's worth spending this much on a graphics card, let alone nVidia's older GeForce2 Ultra chipset. In addition, you could save £45 with Gainward's nVidia GeForce3-based card, or save more money on the other Ultra cards here.

Price aside, the card itself is attractive, with green anodised heatsinks mounted on the memory chips and a large fan/heatsink on the GPU to help keep it cool. The main reason it gets so hot is, of course, the clock rate at which the GPU runs – in this case, a full 250MHz with the 64MB of DDR SDRAM speeding along at 458MHz. This sort of performance sees the Creative card mix with the other GeForce2 Ultra-based boards in all the tests, where the powerful GeForce3-based cards overshadow them.

What this Creative graphics board lacks is any form of extra outputs other than the standard D-SUB connector.

An installation CD contains the drivers, and Creative's Enhanced BlasterControl utility for running card diagnostics, and adjusting the monitor, OpenGL and Direct3D settings. Creative's LAVA! Player and a copy of the game MDK2 are also included.

Overall, Creative's offering is a bit over-priced and hard to recommend.

Elsa Gladiac 511 TV-out

PRICE £119.99 (£102.12 ex VAT) **CONTACT** Elsa 0800 056 3445 www.elsa.co.uk
PROS Big heatsink; TV-out; 64MB **CONS** Comparatively poor value for money
OVERALL Too pricey to compete with similar cards and it's outclassed by the Kyro II boards
SCORE

Elsa is one of the biggest graphics card manufacturers in Europe, producing a wide range of products, from mainstream gaming cards to professional high-end products for realtime rendering. This is one of its lower-end cards and is based on the now familiar GeForce2 MX 400 chip from nVidia.

The Gladiac 511 is available in several different models, our review sample being a 64MB AGP card with S-Video out. Elsa has gone for the standard green PCB look and passive cooling, although it has fitted a massive heatsink to the GPU that should keep it well cooled.

At the recommended retail price of £119.99 inc VAT, this is far from the cheapest card to offer these features, with much of the competition costing at least £20 less. You would expect the 511 to offer something extra for the price but, sadly, this is not the case.

The Gladiac 511 doesn't even perform any better or worse than its peers, proving to be an average 64MB MX 400 card. This, together with the price, makes it very hard for us to recommend the 511, as you get the same performance but better value for your money from any of the other MX 400 cards on test this month.

Elsa Gladiac 920

PRICE £349.99 (£298.86 ex VAT) **CONTACT** Elsa 0800 056 3445 www.elsa.co.uk
PROS S-Video out; good price for a GeForce3 **CONS** Not as cheap as the Gainward
OVERALL A good-value GeForce3 card with S-Video out and a bundled game
SCORE

Elsa has been in the graphics card market for some time and used to specialise in high-end graphics workstation cards. The company is still prevalent in the high-end market, producing boards based on nVidia's Quadro chipset. This card, though, is based on nVidia's top-of-the-range consumer chipset, the GeForce3. Like all GeForce3-based cards, the Gladiac 920 produced very fast results in our benchmarks.

The GeForce3 chipset supports all the 3D features you could want, such as a T&L engine, hardware environment bump mapping and multi-texture pixel shading. With 64MB of high-speed DDR memory it's clear that the 920 isn't going to be cheap, but at £349.99 it's the second cheapest GeForce3 card in this group test.

Unsurprisingly the Gladiac 920 sits near the top of all the performance charts along with the other GeForce3-based cards. There's no doubt that you're buying the most future-proof graphics chipset, with a very full feature set and DirectX 8 compatibility. You're also getting an S-Video out port along with a converter to composite in case your TV doesn't support S-Video. There's also a full copy of the 3D extravaganza Giants, which really shows the 3D features off to good effect.

Elsa Gladiac Ultra LE

PRICE £299.99 (£254.46 ex VAT) **CONTACT** Elsa 0800 056 3445 www.elsa.co.uk
PROS Fast card; 3D glasses if you want them **CONS** Comparatively expensive
OVERALL You're better off spending a little more and getting a GeForce3
SCORE

As the name suggests this card from Elsa is based on nVidia's GeForce2 Ultra chipset. Although it's not the cutting edge any more, this is still a very fast graphics chipset as the performance results show. What's missing from the feature set is hardware environment bump mapping, which nVidia included in the later GeForce3 chipset.

The core runs at a very fast 250MHz, while the 64MB of DDR memory ticks along at 458MHz. Both the GPU and the memory are topped with green heatsinks, while the GPU sports a fan assembly as well. There's only a single D-SUB output on the card so there'll be no DVD watching on your TV, but Elsa has bundled something a little special with the Ultra.

Nestling in the box inside what looks like a pouch for a pair of Oakley sunglasses is a set of 3D glasses. Unfortunately, the general opinion of the *PCW* team is that these glasses tend to result in a headache rather than an enjoyable experience, but for those who like the effect, it adds some value to the package.

The main problem with Elsa's Gladiac Ultra is the price. At £299 inc VAT it's three times as expensive as the Vivid!XS and only £30 cheaper than the GeForce3 card from Gainward.

Gainward GeForce2 MX 400 Jumbo

PRICE £99.99 (£85 ex VAT) **CONTACT** CCL 01274 471 201 www.cclcomputers.co.uk
PROS TV-out; 64MB **CONS** No match for the Vivid!XS
OVERALL Yet another MX 400 card that has little extra to offer over the competition
SCORE

The Jumbo is one of Gainward's entry-level nVidia cards and, as such, it lacks some of the features that can be seen on the more expensive cards.

To start with, this is not a 'Golden Sample' board, meaning that the memory cannot be overclocked as far as some of the other Gainward units. This also means that it doesn't come with the utility that allows you to run the card at an 'enhanced' setting. For most users this is of little importance, although it might make the Jumbo less appealing to some.

The card comes in the standard green colour, fitted with 64MB of SDRAM and an S-Video out port. Gainward has also supplied an S-Video-to-composite adaptor.

As with all its other cards, Gainward supplies a utility disc, which contains trial copies of PowerDVD as well as WinDVD and some other useful utilities. It would have been good to see a full version of either of these players, but Gainward has gone down the budget route with the Jumbo.

The Jumbo is middle of the road as far as performance is concerned, offering little to put it ahead of the competition. Price-wise it's not a stunner either; at £99.99 inc VAT it is no different from most other 64MB MX 400 cards here.

Gainward GeForce3 PowerPack

PRICE £329.99 (£280.84 ex VAT) **CONTACT** CCL 01274 471 201 www.cclcomputers.co.uk
PROS Very fast; video-in and out; software bundle **CONS** GeForce3s are still very expensive
OVERALL If you want a card with all the bells and whistles and have the cash to spare, this is it
SCORE

Gainward is a fairly new company on the UK market and may be more well-known under the name Cardexpert. The GeForce3 PowerPack is a very impressive card in every respect, when compared to all the other GeForce3 boards in this round-up, with the exception of the Asus V8200.

The PowerPack is made out of a red PCB, fitted with a round red heatsink and fan as well as red memory heatsinks. The card also offers a host of ports as it has a standard D-SUB as well as a DVI connector for digital flat panels.

The most interesting feature is the video-in/out connector that gives you both S-Video and composite video-in and out. This is ideal for DVD playback on your TV as well as for some basic video editing, especially as the PowerPack comes with a copy of Ulead Video Studio 5. Other software consists of a copy of WinDVD 2000 and a utility disc from Gainward.

This is one of the fastest cards in the group test and it performs even better if you enable the 'enhanced' mode which overclocks the settings. This is within the card's warranty as long as you use the supplied utility. Adding the performance together with the excellent price, it's hard not to recommend the PowerPack GeForce3.

Gainward Hollywood/MX

PRICE £199 (£169.36 ex VAT) **CONTACT** CCL 01274 471 201 www.cclcomputers.co.uk
PROS TV/radio-tuners; video in/out; decent performance **CONS** Not as good as the All-in-Wonder
OVERALL A very capable card from Gainward and worth a look if you can't afford ATi's All-in-Wonder
SCORE

Taking a tip from ATi's All-in-Wonder, Gainward has produced a similar all-round video solution. The Hollywood is based on nVidia's GeForce2 MX 400 chipset, making it a budget option from the chipset point of view, but adding significant value with a very full feature set.

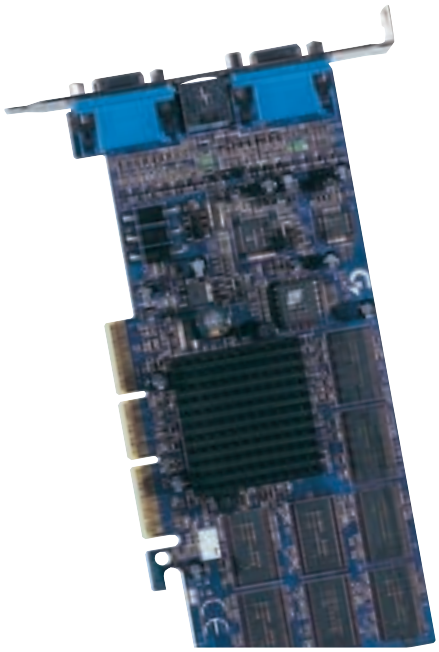
Backing up the MX 400 chipset is 32MB of video memory, placing it near the top of the GeForce2 MX cards. Gainward also supplies a utility to overclock the card but, unlike other manufacturers, guarantees the card when run at 'enhanced' settings.

As well as the onboard TV-tuner the Hollywood also sports an FM radio, making it very versatile indeed. The backing plate sports aerial sockets for the TV and radio-tuners, along with a video-in/out port, audio-out and the 15pin D-SUB port. It's a shame that Gainward hasn't gone for a DVI solution like ATi, but the choice of older technology will keep costs down. This card also lacks the S/PDIF (Sony/Philips Digital Interface) output that the All-in-Wonder Radeon sports.

On the whole, Gainward has done a great job with this card, packing it with features while making the performance admirable, considering the chipset. If you really can't afford the All-in-Wonder Radeon, the Hollywood is a decent alternative.

Gigabyte GA GF1280RT-64

PRICE £99.88 (£85 ex VAT) **CONTACT** Dabs 0870 429 3120 www.dabs.com
PROS Dual D-SUB for Twin View **CONS** Not the fastest card around
OVERALL The Twin View feature can be handy for some, but apart from that this is an average card
SCORE



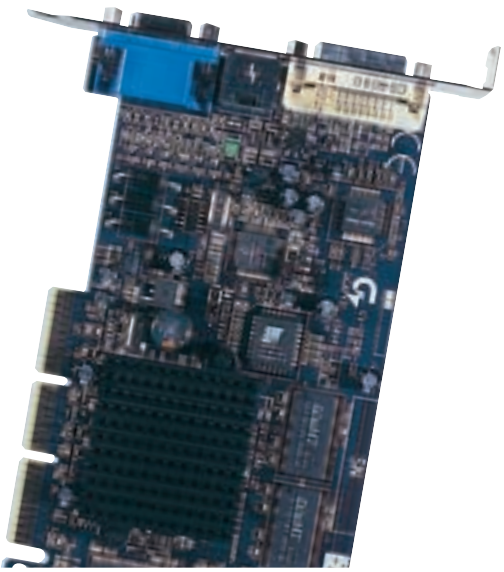
This is the faster sibling to Gigabyte's GF1280T-32E (see review below) and even though it differs little in terms of specifications there are still a few points that are worth noting.

The biggest difference is, of course, that the GF1280RT-64 uses the much faster GeForce2 MX 400 chip rather then the MX 200 of the GF1280T-32E. The GF1280RT-64 also has twice the memory of its sibling with 64MB onboard rather than 32MB.

The only other difference is that the GF1280RT-64 sports two D-SUB connectors rather than a D-SUB and a DVI. If you're interested in pumping DVD movies out to your TV, you'll be glad to know that there's an S-Video out port thrown into the bargain.

A good thing is that Gigabyte has fitted two jumpers on the card that allow you to choose between PAL and NTSC signal output. All in all, not that remarkable, but what is interesting to see is that the GF1280RT-64 is the same price as some of the less fully featured competition.

The PCB is the traditional Gigabyte blue colour and comes with a small passive heatsink to cool the GPU. The performance is not all that hot, although this is one of the faster MX 400 cards in this group test.



Gigabyte GA GF1280T-32E

PRICE £69.33 (£59 ex VAT) **CONTACT** Dabs 0870 429 3120 www.dabs.com
PROS DVI and S-Video connectors; Twin View **CONS** Slow 3D performance
OVERALL Nothing much new – if you want a gaming card look elsewhere
SCORE

Gigabyte is yet another motherboard manufacturer that has moved into the graphics card market, although mainly as a source for system builders rather than end users.

The GF1280T-32E is Gigabyte's entry-level card, but it offers a bit more than most at this price point. It's based on the GeForce2 MX 200 chip, which is not the fastest offering around, and has 32MB of memory.

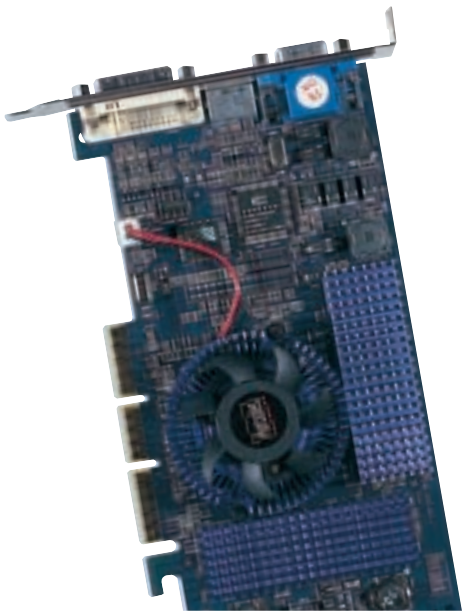
As with most new Gigabyte products it has a blue PCB, but apart from that it looks like any other graphics card. What is interesting is the set of connectors that Gigabyte has fitted. The GF1280T-32E has the standard D-SUB connector as well as DVI and an S-Video out port. This makes it a very versatile card, especially if you're planning on buying a digital flat panel at some point. If you do purchase such a device you can use the Twin View feature of the MX chipset as well as your old analog monitor at the same time.

On the other hand, the 3D performance of this Gigabyte card is very poor, although it is the fastest of the MX 200 cards on test.

Overall, the GF1280T-32E is a budget card at a budget price with a few extra features thrown in.

Hercules 3D Prophet III

PRICE £379.99 (£322.55 ex VAT) **CONTACT** Hercules 020 8686 5600 www.hercules.com
PROS Very fast; S-Video out **CONS** Comparatively expensive
OVERALL A very fast card based on the GeForce3 chipset, but it's not the cheapest
SCORE



When we first looked at the 3D Prophet III in the May 2000 issue of *PCW*, it was the first time we'd tested the new GeForce3 chipset. Although we were very impressed with the overall performance of the card, the price made it hard to recommend. A couple of months later, the price has dropped a bit, but the 3D Prophet III is still a costly proposition, even with the most advanced graphics chip available.

Hercules has coloured its card in the now trademark blue, with matching blue heatsinks over the memory and heatsink/fan assembly over the GPU.

Pitting the 3D Prophet III against its peers shows it to be a very fast card indeed. It's pretty much top of the performance chart in almost all our tests. That said, the Gainward GeForce3 card is just as fast and is £50 cheaper.

There's an S-Video out port on the card and an S-Video-to-composite converter included in the box in case your TV doesn't have an S-input.

There's no doubting that the 3D Prophet III is a high-quality card. It's very fast and the GeForce3 chipset has the most comprehensive feature set money can buy. But if you're set on a GeForce3 the Gainward offers better value for money.

Hercules 3D Prophet 4000XT

PRICE £64.99 (£55.31 ex VAT) **CONTACT** Hercules 020 8686 5600 www.hercules.com
PROS Price/performance ratio is excellent **CONS** Not the fastest card on the planet
OVERALL If you're on a tight budget, this is the card to go for
SCORE

The 3D Prophet 4000XT is a bit of a strange product. Even though it has only recently been launched it is based on the fairly old Kyro chipset from ST Microelectronics.

Feature-wise this card is exactly the same as the VideoLogic Vivid! but, as always, Hercules has added its own touch and produced a blue PCB complete with a small round blue fan on top of the heatsink covering the chip. We're not sure why Hercules did this, since the Kyro doesn't run all that hot as it is only clocked at 115MHz. This also goes for the 32MB of graphics memory present on the board.

The card we received for review is the basic model, but Hercules also offers a version with TV-out. What impressed us the most about the 3D Prophet 4000XT was the price, as it is the cheapest graphics card in this round-up at a mere £64.99 inc VAT. This makes it even cheaper than the low-budget-based offerings from nVidia.

In terms of performance this card does much better than most of the MX 400 models, only beaten by the fastest of the MX 400-based cards.

The 4000XT is an excellent card for the money and if you're on a very tight budget, this should be top of your list.

Hercules 3D Prophet 4500

PRICE £129.99 £110.62 ex VAT) **CONTACT** Hercules 020 8686 5600 www.hercules.com
PROS Fast and reasonably priced **CONS** No T&L
OVERALL An excellent graphics card but the VideoLogic Vivid!XS offers better value
SCORE

Hercules was the first manufacturer to release a graphics card based on the new Kyro II chipset from ST. This is a great graphics chip that offers an excellent price/performance ratio.

The 4500 may not be as fast as cards based on nVidia's latest GeForce3 chipset, but it is a fraction of the cost. The card sports a round heatsink and fan assembly, although ST claims that a fan isn't necessary. There's 64MB of SDR memory onboard. The slower memory keeps the cost of the card down, but the tile-based rendering design of the chipset allows efficient use of slower memory. This is borne out by the impressive performance exhibited by the 4500, in some cases coming second only to GeForce3-based cards.

Obviously to keep costs down compromises have to be made and the most significant one is the lack of T&L support. This is where the nVidia-based cards and the ATi Radeons have a bit of future proofing. But, as our tests show, by today's standards the lack of hardware T&L doesn't hold back the 4500 in terms of performance.

Ultimately, the 4500 provides great performance at a very attractive price, but the VideoLogic Vivid!XS offers a similar proposition for less.

Leadtek GeForce2 MX 400 SH Max

PRICE £114.99 (£97.86 ex VAT) **CONTACT** SMC Direct 01252 339 706 www.smcdirect.com
PROS S-Video out; added monitoring features **CONS** Not as cheap as the faster VideoLogic cards
OVERALL A cheaper nVidia option, but the Vivid!XS offers more for less
SCORE

Leadtek has used nVidia's range of chipsets in a number of graphics cards including this one, based on the GeForce2 MX 400. Unlike the original MX chipset, that supported both 64 and 128bit SDR/DDR memory types, the MX 400 only supports 128bit versions.

Onboard there's 64MB of 166MHz SDR SDRAM, and the GPU is clocked at 200MHz. When it comes to performance, this combination provides enough power to place the SH Max around the mid-point of our collection of MX 400 cards. It's not the quickest, but with 25MHz more GPU power than a standard MX, and a £114.99 price, it might appeal to budget-conscious gamers.

Unlike its big brother, there are no heatsinks on the memory chips, but you do get added features, such as a built-in hardware sensor for monitoring the temperature and voltage of the chip and board, as well as a set of LEDs that indicate the card's status. On the backplate there's an S-Video output, and in the box there's the same set of composite and S-Video leads found with the GeForce3-based Leadtek card.

With the WinFast DVD player completing the package, the SH Max offers a good set of features, with a decent turn of speed. However, the Kyro II-based cards have the edge.

Leadtek GeForce3 TD

PRICE £399 (£339.57 ex VAT) **CONTACT** SMC Direct 01252 339 706 www.smcdirect.com
PROS S-Video/DVI outputs; GeForce3 chipset; cables; WinFast DVD player **CONS** Weighty; expensive
OVERALL A fine example of a GeForce3 graphics card, that is 'heavily' expensive
SCORE

In terms of layout, this card is similar to the reference cards released by nVidia. However, the large silver GPU heatsink with fan, along with the company-stamped blocks of metal glued to the memory chips, help make it stand out as well as cool it down. In addition, you get an S-Video out for TV gaming and DVD movie viewing, and a DVI output for a digital flat panel. An S-Video lead, S-Video-composite converter, and a composite lead complete the feature set.

Of course, there's power too, with the 200MHz GeForce3 GPU at its heart and a full 64MB of fast 3.8ns DDR SDRAM onboard. Together these produce a set of scores that are up there with the best. It wasn't the fastest GeForce3 card and, along with Elsa's Gladiac 920, it lagged behind the leaders by 500 marks in 3DMark 2000 at 1,280 x 1,024 in 32bit colour. However, this is offset by a very impressive 71.9fps in our Quake III TA test.

The only downfall is its weight and price. With those beefy heatsinks, you really have to make sure that the card is well secured in your system, and that the £399 price tag won't burn a hole in your pocket.

Nevertheless, if you want excellent power with all the features, the Leadtek is worth a look.

VideoLogic Vivid!

PRICE £75 (£63.82 ex VAT) **CONTACT** VideoLogic 01923 260 511 www.videologic.co.uk
PROS Price/performance; doesn't need fastest PC **CONS** More expensive than 3D Prophet 4000XT
OVERALL A very capable card for the price
SCORE

VideoLogic was the first company ever to offer a card based on the PowerVR engine which uses tile-based rendering for 3D scenes. Scenes are rendered a bit at a time rather than the whole thing being done at once. Another feature is the hidden surface removal, which improves overall performance even more, as it only renders the bits you see rather than things that will be obscured by other objects.

The Kyro chipset is the third-generation PowerVR technology and adds environment bump mapping, FSAA and eight-layer multi-texturing support.

The Vivid! can still offer quite a punch compared to nVidia's GeForce2 MX cards. It even managed to outperform the new MX 400 cards by a good margin most of the time in every test we did.

An advantage of the PowerVR architecture is that you won't need the fastest system money can buy to get decent performance. Compared to our December 2000 review, when we tested the card in a Pentium III 733MHz system, the speed increase was only marginal in the much faster Athlon machine in 3DMark 2000.

It's hard to fault the Vivid! in any way, apart from the fact that the 3D Prophet 4000XT is £10 cheaper and just as good.

VideoLogic Vivid!XS

PRICE £99 (£84.25 ex VAT) **CONTACT** VideoLogic 01923 260 511 www.videologic.co.uk
PROS Amazing value; solid performance **CONS** No T&L support
OVERALL Fantastic value for money; one of the best cards around
SCORE

VideoLogic co-developed the Kyro II chipset with ST, so it's not surprising to see a VideoLogic card based on this technology. Without a doubt the Kyro II is one of the best graphics chips we've seen in a very long time. The Kyro II may not have the fullest feature set of all the cards on test, with the lack of T&L support being the most obvious omission, but what can't be ignored is that this card produces admirable performance at an unbelievable price.

Even though this card only has 32MB of SDR memory this hasn't hindered its performance. That said, the architecture of the Kyro II allows it to perform very efficiently using slower memory, ultimately keeping costs down.

The Vivid!XS has an S-Video output as well as the D-SUB connector, allowing you to pump the signal to a TV for watching movies or some large-screen game playing.

Performance is below the GeForce3 and GeForce2 Ultra cards, but well above all the similarly priced GeForce2 MX cards, making it a superb choice for anyone on a budget.

It's been a while since VideoLogic has been at the top of its game in the graphics card arena, but the Vivid!XS does just that and wins an Editor's Choice as well.

HOW WE TEST

For the fastest graphics cards around we needed a fast system to test them on. Here's what we did

3DMark 2001 tests DirectX 8 performance

MDK2 incorporates some support for T&L

Quake III TA was the first of two OpenGL tests

This group test features the fastest graphics cards to date so we had to find suitably fast systems to test them on. Systemax supplied two 1.3GHz AMD Athlon machines with 128MB of SDRAM and Windows Me, that we found to be sufficiently fast for our needs.

Compared to our last graphics card group test a few things have changed with regard to what benchmarks we ran, due to the advances in the performance of the new graphics chipsets and the plethora of features now on offer from the latest batch of accelerators. We did, of course, use 3DMark, a test that most *PCW* readers are already familiar with, but this time around we threw in a couple of different OpenGL benchmarks as well. We used Quake III: Team Arena and MDK2. Both of these are fairly recent games that feature a built-in time demo which displays a frame count after running, giving you an indication of how fast the card can handle the high polygon pressure of the game. Overall, this should prove to be a comprehensive set of tests to show off the latest graphics cards on the market and help separate the wheat from the chaff.

As for 2D, there is really no point in running any 2D benchmarks as even the cheapest graphics card that you can buy today boasts excellent 2D image quality and performance.

3DMark 2000

Remedy Entertainment's MAX-FX game engine is used to test the DirectX 7 performance in 3DMark 2000. It runs two specially coded games at low, medium and high detail levels. We ran the benchmark at 1,280 x 1,024 in 32bit colour, as well as 1,600 x 1,200 in 32bit colour. The 3DMark result is calculated by adding together the average frames per second (fps) for each game and multiplying the result by 12.

3DMark 2000 is a bit of an aging benchmark by today's standards but offers an easily comparable score to previous tests in *PCW*, although you can't compare scores between differently configured systems as far as any of these benchmarks are concerned.

3DMark 2001

This is the latest incarnation of 3DMark and is a DirectX 8 test that runs three new, specially coded games at low and high detail. There is also a fourth test, which only runs on cards that feature a vertex shader (currently only the GeForce3).

This results in a higher score being given to these cards than to others. This benchmark was also run at 1,280 x 1,024 in 32bit colour as well as 1,600 x 1,200 in 32bit colour. The result is calculated by adding together the average frame rate for the first three games in low detail and multiplying by 10. The average frame rate for the fourth game, and the first three games in high detail are then added together and multiplied by 20. Finally, the two scores are added together to produce the final result.

We did not use compressed textures as some of the graphics cards where not able to produce correct textures with this enabled, although this is only an issue in 3DMark 2001 and shouldn't affect gameplay.

Quake III: Team Arena

Our first OpenGL test was Quake III: Team Arena. This is an add-on for Quake III: Arena (see page 50) and includes the latest patch for Quake III as well as a couple of new timedemos that put a bit more pressure on the graphics cards.

The settings were:
Video mode: 1,280 x 1,024 and 1,600 x 1,200.
Colour depth: 32bit, full screen, normal texture detail.
Texture quality: 32bit.
Geometric quality: high.
Texture filter: bilinear and lightmap (high).
Compressed textures: no.
At the command prompt we typed:

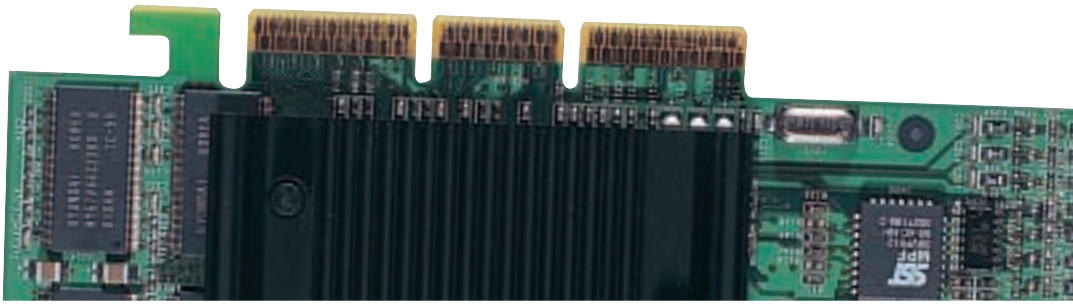
```
timedemo 1
demo mpdemo2
```

This runs demo 2 and records the frames per second.

MDK2

Our second OpenGL benchmark, MDK2, is slightly different to Quake III: Team Arena as it is a third -person shooter rather than a first-person shooter. MDK2 does also incorporate support for Transform and Lighting (T&L) to some degree, although not as significantly as 3DMark, but should in theory improve the performance of the cards that support T&L. As with previous games we ran MDK2 at 1,280 x 1,024 and 1,600 x 1,200, both at 32bit colour depth.

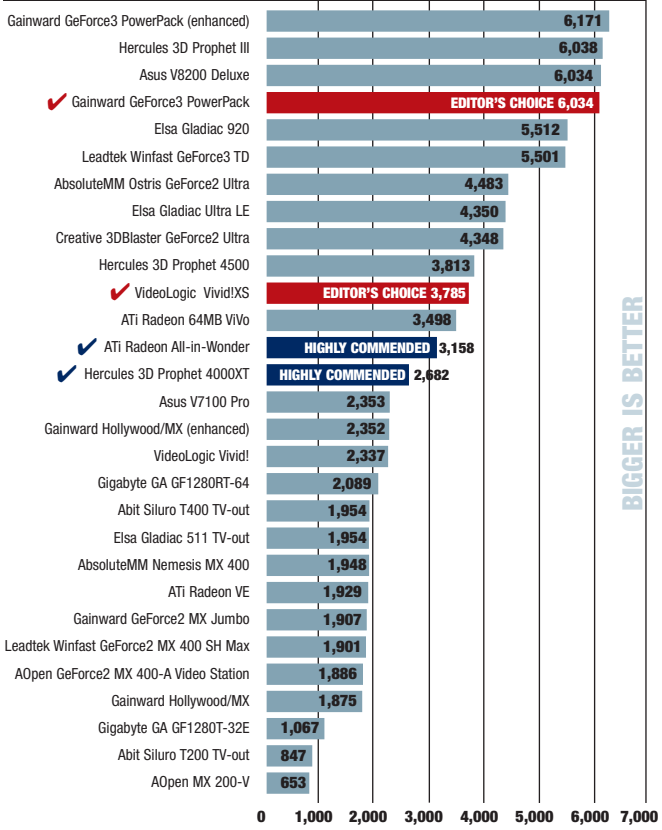
The following settings were used:
Texture quality: set to three quarters of the slider
Colour depth: 32bit.
Filtering: trilinear.
Mipmap: on.
Fullscreen: on.
Hardware T&L: on (if the card supported T&L).



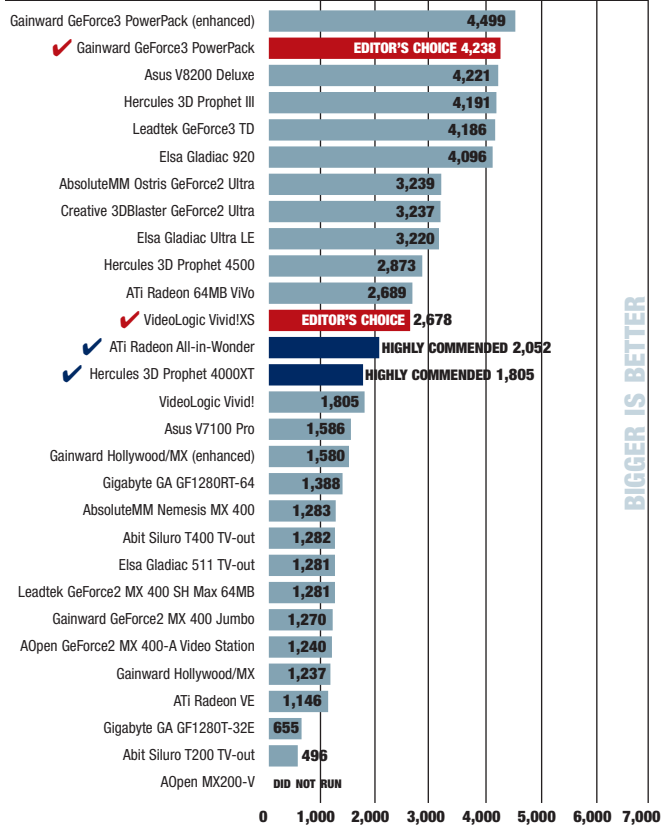
These fast graphics cards were tested to the limit

LAB RESULTS

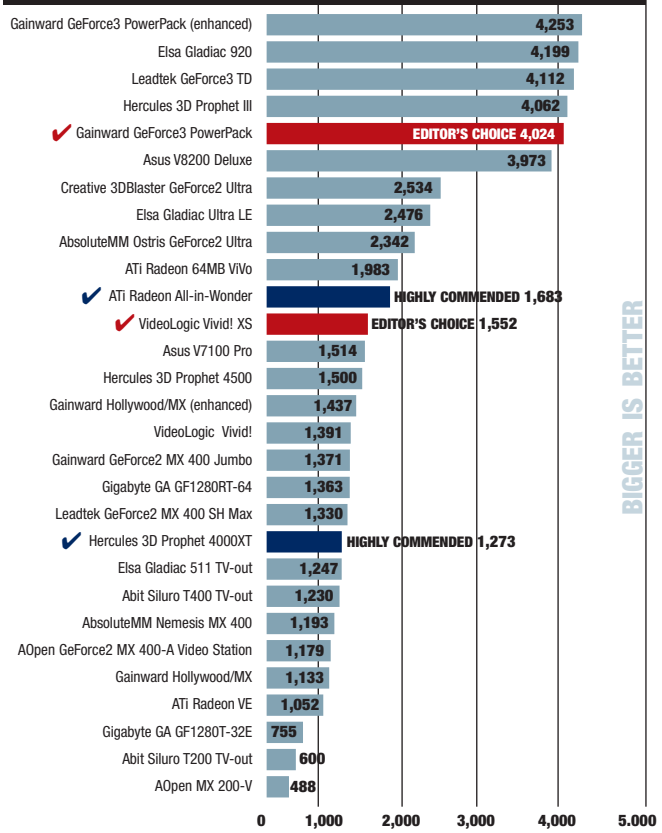
3DMark 2000 (1,280 x 1,024 at 32bit)



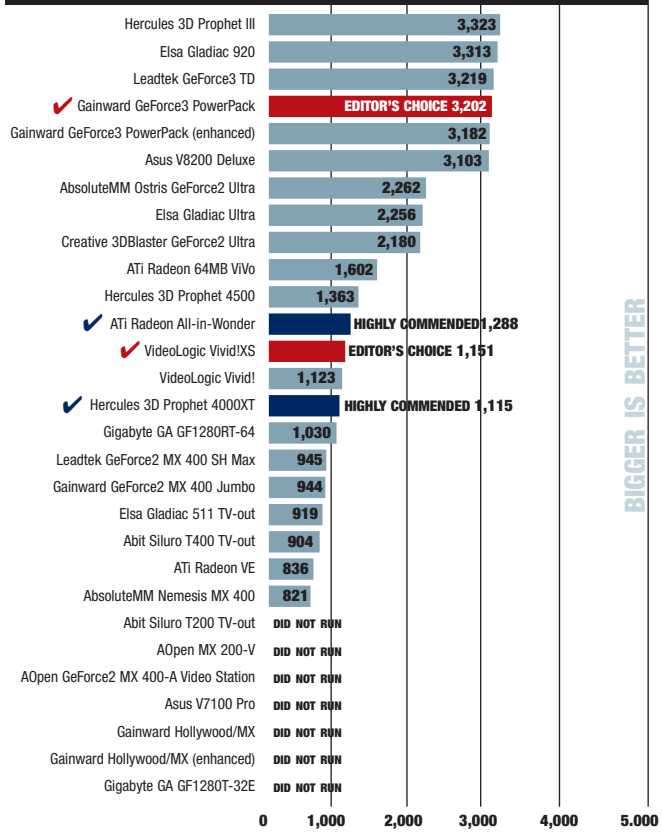
3DMark 2000 (1,600 x 1,200 at 32bit)

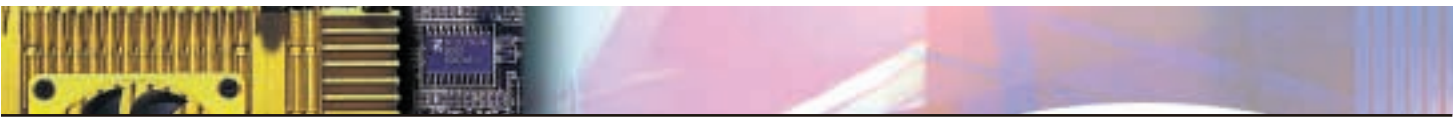


3DMark 2001 (1,280 x 1,024 at 32bit)

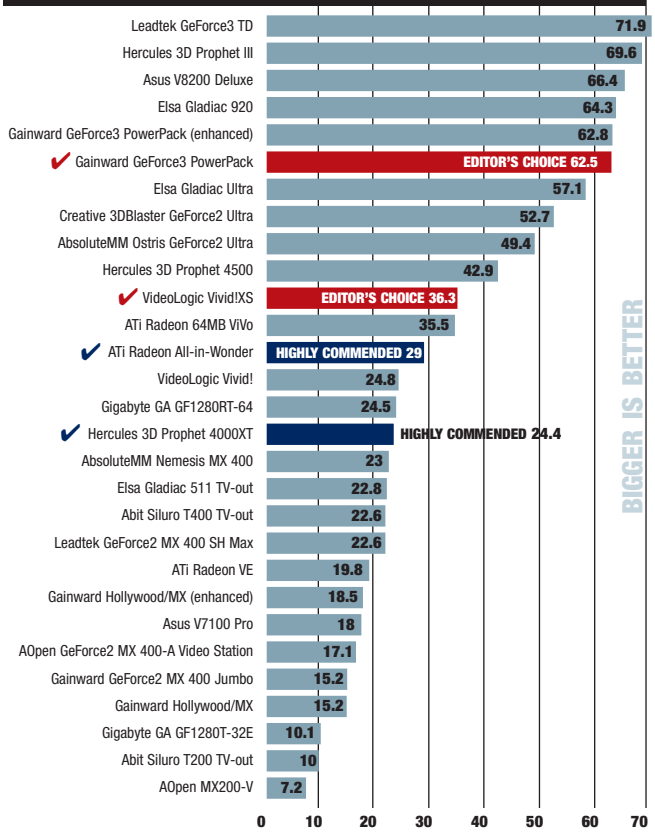


3DMark 2001 (1,600 x 1,200 at 32bit)

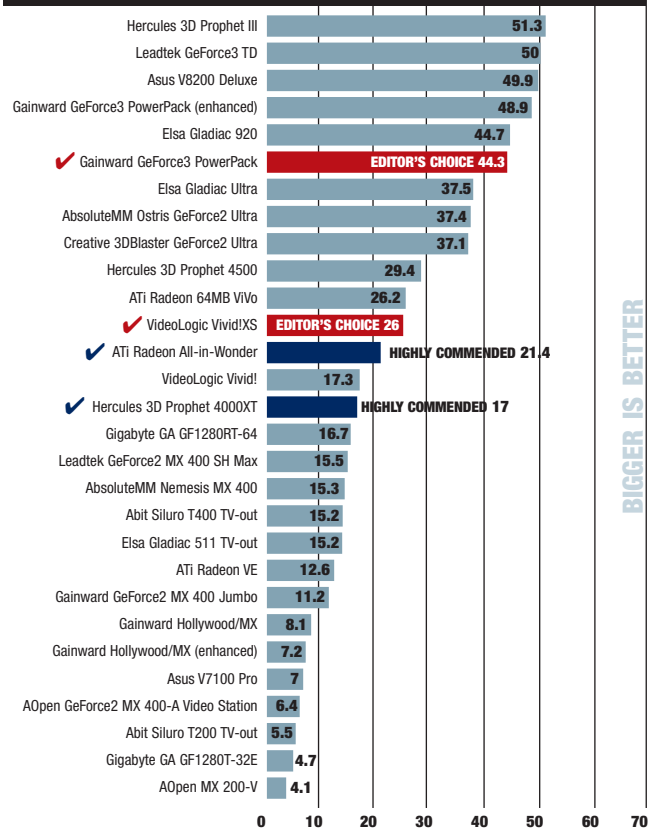




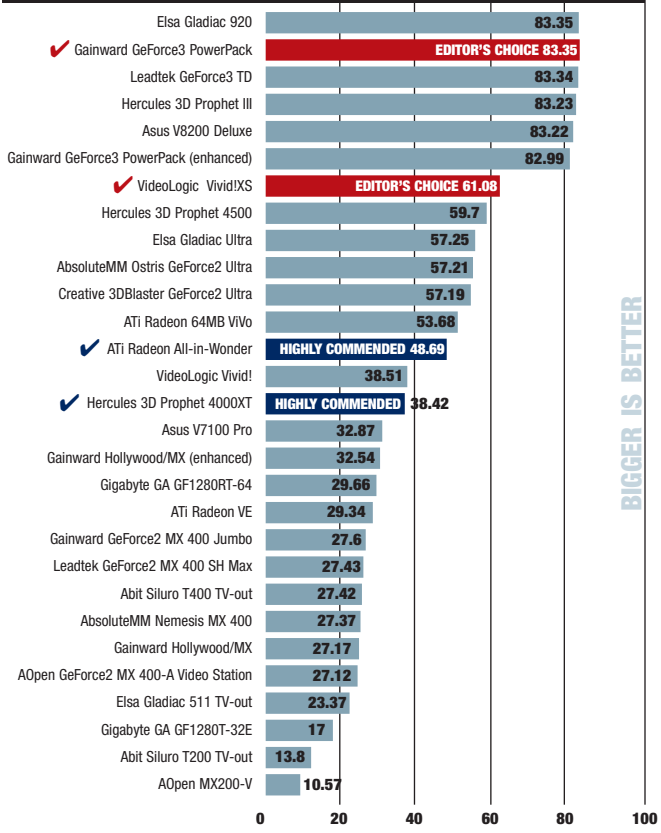
Quake III TA (fps) (1,280 x 1,024 at 32bit)



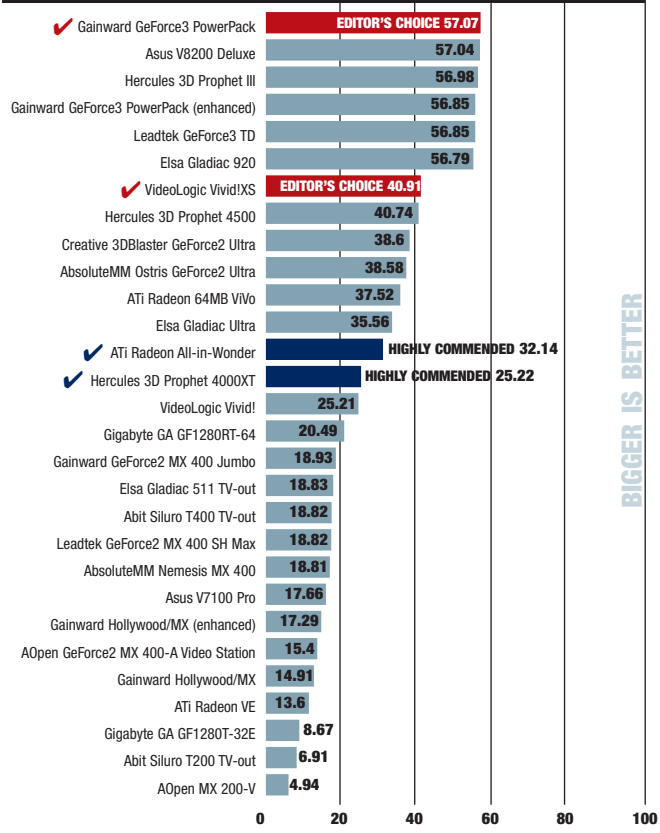
Quake III TA (fps) (1,600 x 1,200 at 32bit)



MDK2 (1,280 x 1,024 at 32bit)



MDK2 (1,600 x 1,200 at 32bit)



Please see page 174 for an explanation of how we tested the PCs

TABLE OF FEATURES

MANUFACTURER	ABIT	ABIT	ABSOLUTEMM	ABSOLUTEMM	AOPEN	AOPEN	ASUS	ASUS
MODEL NAME	**SILURO T200 TV-OUT**	**SILURO T400 64MB TV-OUT**	**NEMESIS MX 400**	**OSTRIS GEFORCE2 ULTRA**	**GEFORCE2 MX 200-V**	**MX 400-A VIDEO STATION**	**V7100 PRO**	**V8200 DELUXE**
Price inc VAT (ex VAT)	£68.15 (£58)	£86.95 (£74)	£99.99 (£84.25)	£269 (£229)	£66.96 (£57)	£146.86 (£124.99)	£105.75 (£90)	£358.37 (£305)
Contact	Abit 01438 228 888 www.abit.nl	Abit 01438 228 888 www.abit.nl	3DPower 01252 820 841 www.3dpower.com	3DPower 01252 820 841 www.3dpower.com	Jungle.com 0800 0355 355 www.jungle.com	Jungle.com 0800 0355 355 www.jungle.com	Dabs 0870 429 3120 www.dabs.com	Dabs 0870 429 3120 www.dabs.com
CARD DETAILS								
GPU	nVidia GeForce2 MX 200	nVidia GeForce2 MX 400	nVidia GeForce2 MX 400	nVidia GeForce2 Ultra	nVidia GeForce2 MX 200	nVidia GeForce2 MX 400	nVidia GeForce2 MX 400	nVidia GeForce3
GPU clock speed (MHz)	175	200	200	250	175	200	200	200
RAMDAC frequency (MHz)	350	350	350	350	350	350	350	350
Memory/type	32MB SDRAM	64MB SDRAM	64MB SDRAM	64MB DDR SDRAM	32MB SDRAM	32MB SDRAM	32MB SDRAM	64MB DDR SDRAM
Memorry frequency (MHz)	166	166	166	460	166	166	166	460
Memory bandwidth	64bit	128bit	128bit	128bit	64bit	128bit	128bit	128bit
Interface	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP
D-SUB	✔	✔	✔	✔	✔	✔	✔	✔
DVI	✗	✗	✗	✗	✗	✗	✗	✗
S-Video/composite out	✔/✗	✔/✗	✗/✗	✔/✗	✔/✗	✔/✔	✔/✔	✔/✔
S-Video/composite in	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗	✔/✔	✗/✗	✔/✗
TV-tuner	✗	✗	✗	✗	✗	✔	✗	Optional external
Other	N/A	N/A	N/A	N/A	N/A	Audio pass through	N/A	3D glases
DVD motion compensation	✔	✔	✔	✔	✔	✔	✔	✔
MAX 2D REFRESH RATES (HZ) IN 32BIT								
1,024 x 768	200	200	200	200	200	200	200	200
1,280 x 1,024	170	170	170	170	170	170	170	170
1,600 x 1,200	100	100	100	100	100	100	100	100
SUPPORTED 3D RESOLUTION								
1,024 x 768	✔	✔	✔	✔	✔	✔	✔	✔
1,280 x 1,024	✔	✔	✔	✔	✔	✔	✔	✔
1,600 x 1,200	✗	✔	✔	✔	✗	✗	✗	✔
3D SUPPORT								
Transform and Lighting	✔	✔	✔	✔	✔	✔	✔	✔
Hardware enviornment bump mapping	✗	✗	✗	✗	✗	✗	✗	✔
Full Scene Anti-Aliasing	✔	✔	✔	✔	✔	✔	✔	✔
Tile-based rendering	✗	✗	✗	✗	✗	✗	✗	✗
Vertex shader	✗	✗	✗	✗	✗	✗	✗	✔
3D API SUPPORT								
DirectX 7	✔	✔	✔	✔	✔	✔	✔	✔
DirectX 8	✔	✔	✔	✔	✔	✔	✔	✔
OpenGL	✔	✔	✔	✔	✔	✔	✔	✔
OS SUPPORT								
Windows 95/98	✔	✔	✔	✔	✔	✔	✔	✔
Windows Me	✔	✔	✔	✔	✔	✔	✔	✔
Windows NT4	✔	✔	✔	✔	✔	✔	✔	✔
Windows 2000	✔	✔	✔	✔	✔	✔	✔	✔
Linux	✔	✔	✔	✔	✔	✔	✔	✔

	ATI	ATI	ATI	CREATIVE	ELSA	ELSA	ELSA	GAINWARD	GAINWARD	GAINWARD
	RADEON 64MB VIVO	RADEON ALL-IN-WONDER	RADEON VE	3DBLASTER GEFORCE2 ULTRA	GLADIAC 511 TV-OUT	GLADIAC 920	GLADIAC ULTRA LE	GEFORCE2 MX 400 JUMBO	GEFORCE3 POWERPACK	HOLLYWOOD/MX
	£199 (£169.36)	£259 (£220.42)	£99 (£84.50)	£375 (£319.15)	£119.99 (£102.12)	£349.99 (£298.86)	£299.99 (£254.46)	£99.99 (£85)	£329.99 (£280.84)	£199.99 (£169.36)
	ATi 01628 477 788 www.ati.com	ATi 01628 477 788 www.ati.com	ATi 01628 477 788 www.ati.com	Creative Labs 0800 973 069 store.europe.creative.com	Elsa 0800 056 3445 www.elsa.co.uk	Elsa 0800 056 3445 www.elsa.co.uk	Elsa 00800 056 3445 www.elsa.co.uk	CCL Computers 01274 471 201 www.cclcomputers.co.uk	CCL Computers 01274 471 201 www.cclcomputers.co.uk	CCL Computers 01274 471 201 www.cclcomputers.co.uk
	ATi Radeon	ATi Radeon	ATi Radeon VE	nVidia GeForce2 Ultra	nVidia GeForce2 MX 400	nVidia GeForce3	nVidia GeForce2 Ultra	nVidia GeForce2 MX 400	nVidia GeForce3	nVidia GeForce2 MX 400
	183	183	183	250	200	200	250	200	200	200
	360	360	300	350	350	350	350	350	350	350
	64MB DDR SDRAM	32MB DDR SDRAM	32MB SDRAM	64MB DDR SDRAM	64MB SDRAM	64MB DDR SDRAM	64MB DDR SDRAM	64MB SDRAM	64MB DDR SDRAM	32MB SDRAM
	366	366	183	460	166	460	460	166	460	166
	128bit	128bit	64bit	128bit	128bit	128bit	128bit	128bit	128bit	128bit
	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP	2x/4x AGP
	✔	✗	✔	✔	✔	✔	✔	✔	✔	✔
	✗	✔	✔	✗	✗	✔	✗	✗	✔	✗
	✔/✔	✔/✔	✔/✗	✗/✗	✔/✗	✔/✗	✗/✗	✔/✗	✔/✔	✔/✔
	✗/✔	✔/✔	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗	✔/✔	✔/✔
	✗	✔	✗	✗	✗	✗	✗	✗	✗	✔
	N/A	S/PDIF, audio pass through in/out	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Radio-tuner
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	200	200	200	200	200	200	200	200	200	200
	130	130	120	170	170	170	170	170	170	170
	120	120	100	100	100	100	100	100	100	100
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✗
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✗	✗	✔	✗	✗	✔	✗
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	✗	✗	✗	✗	✗	✔	✗	✗	✔	✗
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	✗	✗	✗	✔	✔	✔	✔	✔	✔	✔

TABLE OF FEATURES

MANUFACTURER	GIGABYTE	GIGABYTE	HERCULES	HERCULES	HERCULES	LEADTEK	LEADTEK	VIDEOLOGIC	VIDEOLOGIC
MODEL NAME	GA GF1280 RT-64	GA GF1280 T-32E	3D PROPHET III	3D PROPHET 4000XT	3D PROPHET 4500	WINFAST GEFORCE2 MX 400 SH MAX	WINFAST GEFORCE3 TD	VIVID!	VIVID!XS
Price inc VAT (ex VAT)	£99.88 (£85)	£69.33 (£59)	£379.99 (£322.55)	£64.99 (£55.31)	£129.99 (£110.62)	£114.99 (£97.86)	£399 (£339.57)	£75 (£63.82)	£99 (£84.25)
Contact	Dabs 0870 429 3120 www.dabs.com	Dabs 0870 429 3120 www.dabs.com	Hercules 020 8686 5600 www.hercules.com	Hercules 020 8686 5600 www.hercules.com	Hercules 020 8686 5600 www.hercules.com	SMC Direct 01252 339 706 www.smcdirect.com	SMC Direct 01252 339 706 www.smcdirect.com	VideoLogic 01923 260 511 www.videologic.co.uk	VideoLogic 01923 260 511 www.videologic.co.uk
CARD DETAILS									
GPU	nVidia GeForce2 MX 400	nVidia GeForce2 MX 200	nVidia GeForce3	STM Kyro	STM Kyro II	nVidia GeForce2 MX 400	nVidia GeForce3	STM Kyro	STM Kyro II
GPU clock speed (MHz)	200	175	200	115	175	200	200	125	175
RAMDAC frequency (MHz)	350	350	350	270	300	350	350	270	300
Memory/type	64MB SDRAM	32MB SDRAM	64MB DDR SDRAM	32MB SDRAM	64MB SDRAM	64MB SDRAM	64MB DDR SDRAM	32MB SDRAM	64MB SDRAM
Memorry frequency (MHz)	166	166	460	115	175	166	460	125	175
Memory bandwidth	128bit	64bit	128bit	128bit	128bit	128bit	128bit	128bit	128bit
Interface	2x/4x AGP	2x/4x AGP	2x AGP	2x/4x AGP	2x AGP	2x/4x AGP	2x/4x AGP	2x AGP	2x AGP
D-SUB	✔	✔	✔	✔	✔	✔	✔	✔	✔
DVI	✗	✔	✔	✗	✗	✗	✔	✗	✗
S-Video/composite out	✔/✗	✔/✗	✔/✗	✗/✗	✗/✗	✔/✗	✔/✗	✗/✗	✔/✗
S-Video/composite in	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗
TV-tuner	✗	✗	✗	✗	✗	✗	✗	✗	✗
Other	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DVD motion compensation	✔	✔	✔	✔	✔	✔	✔	✔	✔
MAX 2D REFRESH RATES (HZ) IN 32BIT									
1,024 x 768	200	200	200	120	120	200	200	120	120
1,280 x 1,024	170	170	170	120	120	170	170	120	120
1,600 x 1,200	100	100	100	85	95	100	100	85	95
SUPPORTED 3D RESOLUTION									
1,024 x 768	✔	✔	✔	✔	✔	✔	✔	✔	✔
1,280 x 1,024	✔	✔	✔	✔	✔	✔	✔	✔	✔
1,600 x 1,200	✔	✗	✔	✔	✔	✔	✔	✔	✔
3D SUPPORT									
Transform and Lighting	✔	✔	✔	✗	✗	✔	✔	✗	✗
Hardware enviornment bump mapping	✗	✗	✔	✔	✔	✗	✔	✔	✔
Full Scene Anti-Aliasing	✔	✔	✔	✔	✔	✔	✔	✔	✔
Tile-based rendering	✗	✗	✗	✔	✔	✗	✗	✔	✔
Vertex shader	✗	✗	✔	✗	✗	✗	✔	✗	✗
3D API SUPPORT									
DirectX 7	✔	✔	✔	✔	✔	✔	✔	✔	✔
DirectX 8	✔	✔	✔	✗	✗	✔	✔	✗	✗
OpenGL	✔	✔	✔	✔	✔	✔	✔	✔	✔
OS SUPPORT									
Windows 95/98	✔	✔	✔	✔	✔	✔	✔	✔	✔
Windows Me	✔	✔	✔	✔	✔	✔	✔	✔	✔
Windows NT4	✔	✔	✔	✔	✔	✔	✔	✔	✔
Windows 2000	✔	✔	✔	✔	✔	✔	✔	✔	✔
Linux	✔	✔	✔	✗	✗	✔	✔	✗	✗

Editor's Choice

The graphics card market used to be a hard-fought arena with more players than you could shake a stick at. There was a time when you would have seen cards based on chipsets by S3, Rendition, Number 9, Tseng, Cirrus Logic and 3dfx. But now all these names have fallen by the wayside. A couple of years back no-one would ever have thought that the mighty 3dfx would disappear. Its GLide 3D API almost became the *de facto* standard, while its chipsets were the most sought after on the market.

But times change and even the mighty fall, and the name once synonymous with 3D acceleration has been relegated to the realms of fond memory.

Only a few months ago it looked like the 3D accelerator market was set to be dominated by nVidia. There's no doubt that nVidia has made some amazing contributions to the graphics card market, but a monopoly, even by an incredibly innovative company, isn't good. So we breathed a sigh of relief as a degree of competition started to appear.

There's still a presence from one of the biggest names in graphics cards, ATi. Its Radeon chipset may be looking a little dated now, but it can still hold its own and we're hoping ATi has something special up its sleeve to wow us with soon. That said, the strongest competition to nVidia's stranglehold has come from a collaboration between VideoLogic and ST Microelectronics. This alliance produced the Kyro chipset last year, an impressive budget option, but it was the release of the Kyro II chipset a couple of months ago that really set the cat among the pigeons. Kyro II offers an amazing price/performance ratio, making it almost irresistible to anyone who wants decent 3D without paying the earth.

The winners

With 27 cards on test it was hard to pick the winners. We decided to give two Editor's Choice awards, one for the high end and one for the budget market, while the Highly Commended awards reflect stunning value for money and feature-packed versatility.

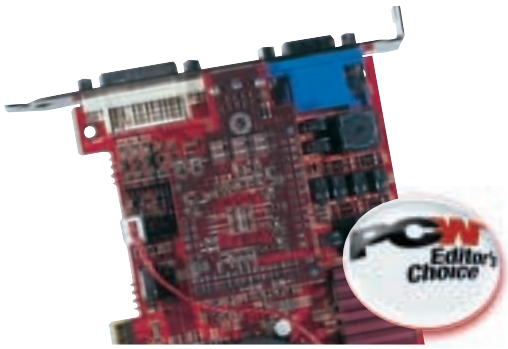
The first **Editor's Choice** award goes, unsurprisingly, to a board based on the nVidia GeForce3 chipset. Although the GeForce3 is a very expensive graphics chipset, it is by far the most advanced graphics solution you can buy. All the cards based on the GeForce3 performed superbly, but one stood out. The **Gainward GeForce3 PowerPack** sported a host of extra features to add to its speedy performance. Obviously you get the lightning-fast GPU coupled with 64MB of fast DDR memory, but this card also has both D-SUB and DVI connectors as well as video-in and out capabilities. So, if you've got a digital flat-panel monitor you'll get the best possible picture and the video editing base is covered too. Add to this the fact that you can overclock the chipset without voiding your warranty, and you have a very tempting proposition. Rounding the whole package off is a price of £329.99 making it the cheapest GeForce3 card on test.

The second **Editor's Choice** goes to a card based on the Kyro II chipset. This is one of the best graphics chipsets we have come across in a long time. OK, so it's not as fully featured or as fast as the GeForce3, but it offers the best price/performance ratio we've seen. Both the Hercules 3D Prophet 4500 and the **VideoLogic Vivid!XS** are excellent cards, but the price of the Vivid!XS grabbed it the award. Retailing at only £99 the Vivid!XS offers unbelievable value and, even though it only sports 32MB of memory, this doesn't seem to hinder its performance. The addition of a TV-out feature makes its price seem even more amazing. If you're looking for great 3D performance without paying the heavy price premium on a GeForce3 card, the Vivid!XS should be top of your list.

Even though Hercules missed out on an Editor's Choice award, it does walk away with a **Highly Commended** badge. The **3D Prophet 4000XT** is based on the older Kyro chipset, but it still outperforms all the cards based on the GeForce2 MX chipset – 200 or 400. But the most amazing thing about this card is that it's the cheapest on test.

The final **Highly Commended** goes to ATi for its **Radeon All-in-Wonder**. This is the most versatile graphics solution you can buy. Not only is it based on the very capable Radeon chipset, but it also includes a TV-tuner, video-in and out, audio-in and out and even an S/PDIF output for when you're using the onboard hardware DVD decoding facility. It may not be the cheapest card on test, but you're getting a lot for your money.

A monopoly, even by an incredibly innovative company, isn't good



Gainward GeForce3 PowerPack

VideoLogic Vivid!XS

Hercules 3D Prophet 4000XT

ATi Radeon All-in-Wonder