PENTIUM M MOTHERBOARD

AOpen i915GMm-HFS

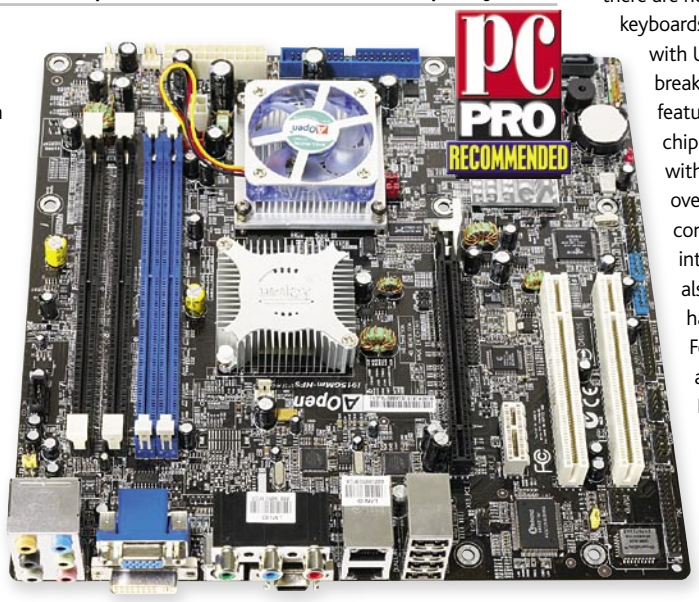
PRICE £128 (£150 inc VAT) DELIVERY £5 (£6 inc VAT)
SUPPLIER www.dabs.com/uk (code: 3NC1D1) INTERNET www.aopen.nl
VERDICT **With a wealth of features, this is the perfect motherboard for a small and quiet system.**

It's been an eventful few months for motherboards, with nVidia releasing the nForce4 Intel Edition chipset (*issue 128, p58*), ECS producing a motherboard that will bizarrely take both Intel and AMD processors (*see p76*) and Gigabyte giving us a first look at retail BTX form-factor boards (*see p74*). Not to be left out, AOpen has released the i915GMm-HFS, a potentially fantastic board for those seeking to build a quiet yet powerful PC.

AOpen was the first to show us a Pentium M desktop board, in the shape of the i855GMEm-LFS (*see issue, 125, p68*). This was based on the 855GM chipset, with the optimistically named Extreme Graphics 2 onboard and no support for PCI Express. This updated model, as the name implies, is based on the chipset behind Sonoma, the new generation of Intel's Centrino technology. That doesn't make this a Centrino motherboard though, as there's no wireless card included, but you do get the 915GM chipset (*see issue 126, p52*), along with its much improved partner, the GMA 900 integrated graphics chip. That allows both D-SUB and DVI outputs on the backplane; the latter is especially handy if you're using an LCD TV or if you want to run a second monitor without investing in a new graphics card. Impressively, you'll also find component and S-Video outputs, catering for just about any TV or monitor combination straight out of the box.

With an eye to the future, this chipset also has support for PCI Express, resulting in a 16x slot for graphics cards, and a single 1x slot for other devices. Older expansion cards are catered for by two PCI slots, which also means you'll be able to build a dual TV tuner system without waiting for dual-digital or PCI Express versions to hit the market.

AOpen has also taken the sensible decision to implement the DDR2 support of the chipset,



With comprehensive AV output, near-silent operation and support for PCI Express, AOpen has ticked practically every box.

although you can also use DDR by adjusting a jumper near the CPU and setting the frequency multiplier in the BIOS (16x 100MHz or 12x 133MHz for our 1.6GHz chip). The 915 chipset will also allow the Pentium M's FSB (front side bus) to run at 533MHz. It's worth noting that despite Intel's marketing mist and nomenclature, all Dothan-cored Pentium Ms are actually capable of running at either this speed or the maximum of 400MHz supported under the 855 chipset.

With 1GB PC5300 DDR2 RAM from Crucial, the i915GMm-HFS scored 1.94, with particularly strong scores in our office-based tasks. With 1GB of Crucial PC3200 DDR RAM, performance dropped a touch to 1.87. It's still a good score, but the DDR2 RAM justifies its currently higher price tag by giving superior performance, as well as throwing off less heat. With such high scores, the Pentium M isn't a bottleneck in most tasks – although it can't compete with a Pentium 4 or Athlon 64 chip when it comes to pure number-crunching tasks such as media encoding. But it's still more than enough for day-to-day tasks, and particularly appealing for a media-centre system.

The micro-ATX form factor means it's small too, measuring just 240 x 244 x 41mm (WDH) even with the near-silent CPU heatsink and fan attached. What's more, after a little BIOS tweaking, the CPU can be cooled passively when not being pressed. Thanks to the power-saving tweaks on the Pentium M – including Enhanced SpeedStep Technology – it won't make a big impact on your electricity bill either. There's also XD (eXecute Disable Bit) hardware protection from buffer overflow attacks – another level of defence should you be making much use of the two Gigabit Ethernet connectors.

There are omissions from the backplane: there are no PS/2 ports, for example. But keyboards and mice are increasingly provided with USB plugs, and AOpen supplies a PS/2 breakout port just in case. There's a fully featured HDA-compliant definition audio chip onboard. It's the Realtek ALC880, with an output sample rate of 96kHz over S/PDIF; AOpen supplies two converters to turn two mini-jack ports into optical S/PDIF in and out. There's also legacy support for AC97 and hardware decoding for DVD-Audio. For gamers, there's EAX support, but audiophiles may rue the lack of Dolby Digital DTS. Still, high-definition 7.1 audio is a welcome inclusion.

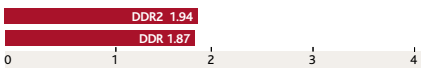
In keeping with the futuristic feel of the board, there's support for two Serial ATA and two Serial ATA 2 hard disks. The ICH6-M south bridge provides two Serial ATA channels with NCQ (Native Command Queuing). A Silicon Image 3132 chip takes a PCI Express lane (250MB/sec in both directions) and runs two Serial ATA 2 (300MB/sec) ports from it. As you can see, the numbers don't quite add up, but you'll rarely need the lost bandwidth, even with the fastest of current hard disks. These Serial ATA 2 connectors do support Hot Plug though, which could be handy if you have a removable hard disk. There's an IDE connector for an optical drive too, but no floppy controller.

There isn't much that AOpen could do to make this a better basis for a media-centre PC. Even a low-end Pentium M has enough power for most conceivable tasks, and AOpen's heatsink keeps it cool without whining about it. The size of the board makes it ideal for small cases, and it's incredibly power-efficient. The superb AV support and reasonable pricing are the finishing touches, making this the ideal basis for a powerful yet discreet PC system.

CLIVE WEBSTER

RESULTS

2D SPEED



DDR2 WP/SPREADSHEET: 2.16 **DATABASE:** 2.06
2D GRAPHICS: 1.64 **MULTIMEDIA:** 1.61

DDR WP/SPREADSHEET: 2.05 **DATABASE:** 2.03
2D GRAPHICS: 1.62 **MULTIMEDIA:** 1.60

BETTER

TEST RIG 1.6GHz Pentium M; 1GB Crucial DDR2 PC5300 RAM; 36GB Western Digital Raptor hard disk; XFX 128MB GeForce 6600 GT graphics.

PC PRO RATINGS

PERFORMANCE	★★★★★☆
FEATURES & DESIGN	★★★★★★
VALUE FOR MONEY	★★★★★☆
OVERALL	★★★★★☆

SPECIFICATIONS Socket 479 Pentium M motherboard; Intel 915GM chipset; Intel GMA 900 integrated graphics; 2 x DDR RAM sockets, 2 x DDR2 RAM sockets; maximum 2GB memory; Ultra ATA/133 connector; 2 x SATA connectors; 2 x SATA 2 connectors; 2 x PCI, 1 x PCI-E (1x), PCI-E (16x); 2 x Gigabit Ethernet; D-SUB and DVI; 2 x component video out; 4 x USB 2; Realtek ALC880 7.1 audio; optical S/PDIF in and out. Manufacturer's code: 91.8EM10.I90.