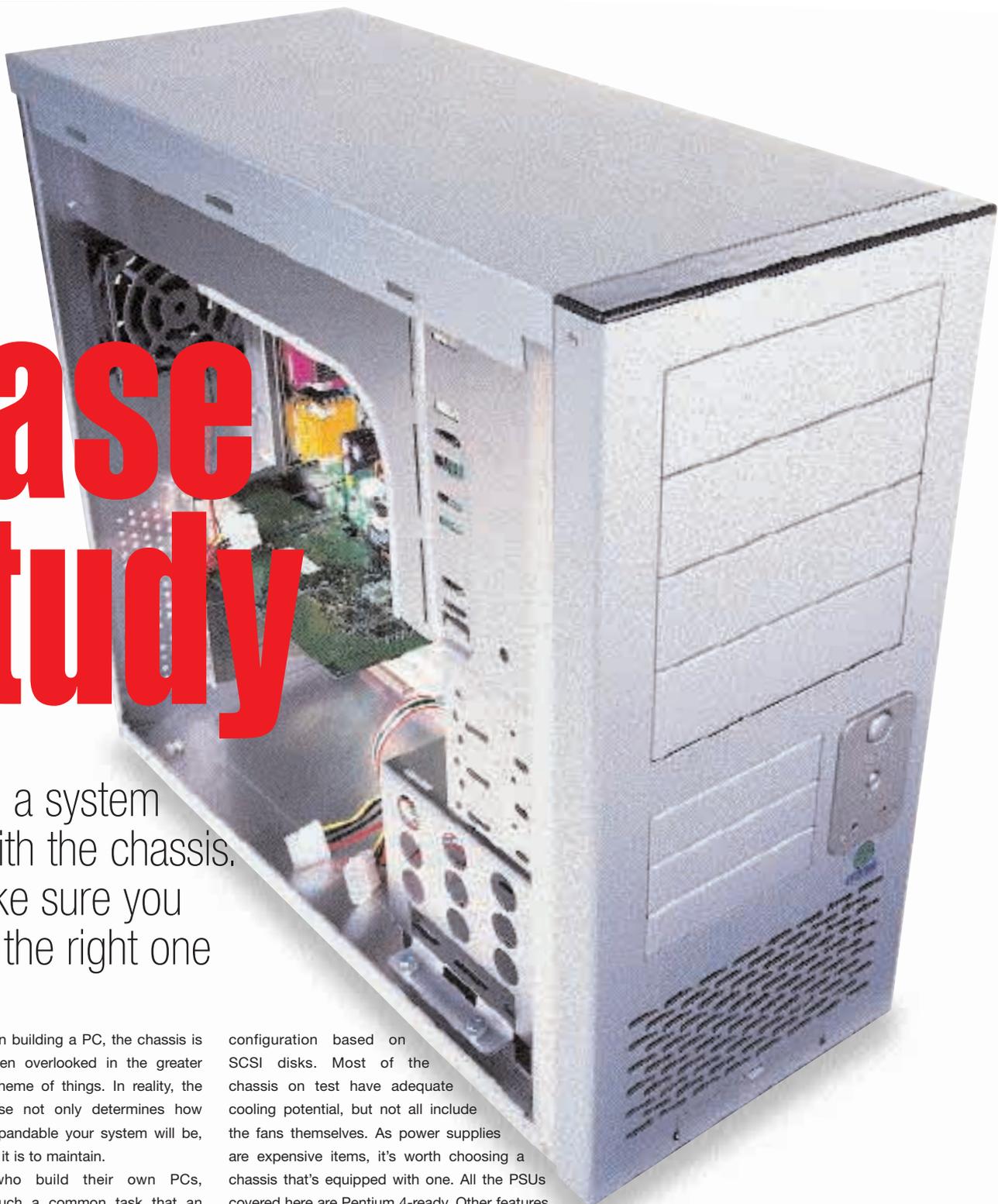


# Case study

Building a system starts with the chassis. We make sure you choose the right one



**W**hen building a PC, the chassis is often overlooked in the greater scheme of things. In reality, the case not only determines how expandable your system will be, but also how easy it is to maintain.

For people who build their own PCs, maintenance is such a common task that an accessible chassis is one of the first features to look for. Chieftec's Black Dragon case, for instance, is notable for its quick-release side panel. Also, a deep chassis is beneficial for motherboard access – front-mounted drives are less likely to obscure EIDE connectors while cables can be neatly routed.

Expansion potential should also be high on your list of priorities – a full tower offers the greatest number of possibilities and is the obvious choice for workstations or servers. But if space is an issue, a midi-tower will save room and several reviewed here offer four 5.25in bays.

Cooling is also important, especially if you intend to overclock components or install a RAID

configuration based on SCSI disks. Most of the chassis on test have adequate cooling potential, but not all include the fans themselves. As power supplies are expensive items, it's worth choosing a chassis that's equipped with one. All the PSUs covered here are Pentium 4-ready. Other features, such as front-mounted USB ports and audio connectors, are handy for connecting devices without reaching blindly behind the PC.

As no testing was required for this Labs, we simply calculated the overall scores based on a weighted combination of features, expansion potential and value for money. Features included quick-release bays, case-retention methods and bundled accessories, while expansion covered drive bays, backplate slots and cooling.

With prices varying from £39 to £159, there's a case for every budget here. To find out which one best suits your needs, take full advantage of the comprehensive feature table opposite and the in-depth reviews over the next few pages.

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**Contributor:**  
Deputy Labs Editor: Jim Martin

Photography by Julian Hawkins

# Specifications & features



	<b>AOpen H600A</b>	<b>AOpen HQ45 Pro</b>	<b>Chieftec Black Dragon DX-01BD</b>	<b>Genius Mars GC-9DA</b>	<b>Holly KA-S88WP</b>	<b>Lian-Li PC-7</b>	<b>Scan 2008</b>	<b>Scan Aluminium</b>	<b>SuperMicro SC760-P4</b>
<b>Overall rating</b>	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
<b>Price* (inc VAT)</b>	£51 (£50)	£46 (£54)	£46 (£58)	£49 (£58)	£77 (£90)	£94 (£110)	£39 (£46)	£140 (£165)	Simply
<b>Supplier</b>	Jungle	data.com	Overclock.co.uk	CCL	Holly Computers	CCL	Holly Computers	Scan Computers	Simply
<b>Supplier's Web site</b>	0870 727 1771	0800 138 5182	020 8574 5592	0845 345 2518	01375 387220	0845 345 2518	0670 755 4747	0870 727 2100	www.simpli.co.uk
<b>Manufacturer's Web site</b>	www.aopen.com	www.aopen.com	www.chieftec.com	www.geniusmars.co.uk	www.hollycomputers.co.uk	www.lian-li.com	www.scan.com	www.scan.com	www.supermicro.com
<b>Chassis type</b>	Mid-tower	Mid-tower	Mid-tower	Mini-tower	Full-tower	Mid-tower	Mid-tower	Mid-tower	Full-tower
<b>Material</b>	Steel	Steel	Steel	Steel	Steel	Aluminium	Steel	Aluminium	Steel
<b>Dimensions H x W x D (mm)</b>	457 x 200 x 460	414 x 198 x 420	522 x 205 x 473	400 x 210 x 435	620 x 187 x 450	443 x 210 x 490	460 x 197 x 515	422 x 200 x 475	670 x 215 x 430
<b>Weight (kg)</b>	10.3	9.1	12.1	8.3	16.6	5.1	8.9	6.9	15.7
<b>Interior specifications</b>									
<b>Motherboard support</b>	ATX, microATX, flexATX, babyAT	ATX, microATX, flexATX, babyAT	ATX, microATX, flexATX, babyAT	ATX, microATX, flexATX, babyAT	ATX, microATX, flexATX, babyAT	ATX, microATX, flexATX, babyAT	ATX, microATX, flexATX, babyAT	ATX, microATX, flexATX, babyAT	ATX, microATX, flexATX, babyAT
<b>Maximum motherboard size (mm)</b>	315 x 260	315 x 270	350 x 275	325 x 250	320 x 340	340 x 270	320 x 300	320 x 350	320 x 350
<b>Front panel 5.25in bays</b>	4	3	4	3	5	4	4	4	6
<b>Front panel 3.5in bays</b>	2	2	1	1	3	2	2	3	1
<b>Internal 3.5in bays</b>	3	1	4	2	3	5	1	3	2
<b>Quick release</b>	5.25in bays only		5.25in bays only						
<b>Removable drive cage(s)</b>	1 x 3.5in	1 x 3.5in	2 x 3.5in	1 x 3.5in	1 x 3.5in	2 x 3.5in	1 x 3.5in	1 x 3.5in	1 x 3.5in
<b>Backplate slots</b>	7	7	7	7	7	7	7	7	7
<b>Fan mounts</b>	2 x 8cm rear, 2 x 8cm side, 1 x 8cm front		2 x 8cm rear, 2 x 8cm front	1 x 8cm rear, 1 x 8cm front	1 x 8cm rear, 1 x 8cm front	1 x 8cm rear, 2 x 8cm front	1 x 8cm rear, 1 x 8cm front	2 x 6cm rear, 1 x 8cm front	1 x 12cm rear, 1 x 8cm rear, 5 x 8cm side, 3 x 8cm front
<b>Removable motherboard panel</b>	X		X	X	X	X			X
<b>Exterior specifications</b>									
<b>Side panel retaining method</b>	Thumbscrews	Screws	Screws, key lock	Screws	Screws	Thumbscrews	Screws	Screws	Screws
<b>Removable front</b>	X	X	X	X	X	X	X	X	X
<b>Custom clip-on front</b>	X	X	X	X	X	X	X	X	X
<b>Lockable front panel</b>	X	X	X	X	X	X	X	X	X
<b>Front panel</b>									
<b>Power button</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Reset button</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>LEDs</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Chassis intrusion switch</b>	Power, HDD	Power, HDD	Power, HDD	Power, HDD	Power, HDD, turbo	Power, HDD	Power, HDD	Power, HDD	Power, HDD
<b>Audio</b>	Headphone mini-jack, microphone mini-jack	Headphone mini-jack, microphone mini-jack	X	X	X	X	X	X	Headphone mini-jack, microphone mini-jack, line-in mini-jack, volume control
<b>USB/FireWire</b>	2 USB	2 USB	X	X	X	4 USB	2 USB	2 USB, 1 FireWire	X
<b>Bundled accessories</b>									
<b>Fans</b>	1 x 8cm rear fan	X	X	X	1 x 8cm rear, 1 x 8cm front	1 x 8cm rear, 2 x 8cm front	1 x 8cm rear	2 x 6cm rear, 1 x 8cm front	1 x 12cm rear, 1 x 8cm rear
<b>Mounting screws</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Blank backplates</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Miscellaneous</b>	Two sets of quick-release rails	X	Two sets of two keys, four sets of quick-release rails	SP-006 speakers, Comfy KB-10 keyboard, NetScroll+ mouse, spare I/O sheaths, power cable	Port labels, power cable	Cable ties	Cable ties, power cable	Front panel cabling	7 x 8cm fan holders
<b>Power supply</b>									
<b>Make and model</b>	AOpen FSP300-60BT	AOpen FSP300-60BT	Chieftec Chemming	Herobich HEC-300AR-PT	Upguards MPT-301	Enemmax EG365P	Meridian MTC-250ATX	Enemmax EG365P	Ablecom SP301-RA
<b>Included with chassis</b>	✓	✓	X	✓	✓	X	✓	X	✓
<b>Cost of recommended PSU if not included (inc VAT)</b>	N/A	N/A	£29 (£34)	N/A	N/A	£45 (£53)	N/A	£45 (£53)	N/A
<b>Supplier</b>	N/A	N/A	Overclock.co.uk	Overclock.co.uk	Overclock.co.uk	CCL	CCL	CCL	N/A
<b>Power output (W)</b>	300	300	340	300	300	350	350	350	300
<b>Power switch</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Monitor passthrough</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Pentium 4-ready</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Large power connectors</b>	7	7	Not stated	5	6	8	8	8	6
<b>Floppy drive connectors</b>	2	2	2	2	2	2	2	2	2

\*Prices correct at time of going to press.





## AOpen H600A

**verdict** Great cooling potential, decent expandability, plus the bundled power supply, make the H600A the best buy.  
**price** £51 (£60 inc VAT)  
**supplier** Jungle 0870 727 1771



aller than the HQ45 Pro, the H600A houses four 5.25in bays and two of the 3.5in variety in the removable front panel. A single interior 3.5in slot remains in the removable top drive cage, but an extra lower cage, which mounts to the floor of the chassis, can accept two further hard disks.

Cooling potential is one of the best we saw in the midi-towers, with five 8cm fan locations. Just one is fitted, but the two side mountings are an innovative use of the space. Vents are cut into the side panel for maximum airflow, a feature absent on the Scan Alumax chassis.

Like several other cases on test, the H600A provides several front panel ports. Two USB connectors and headphone and microphone mini-jack sockets make connecting devices more convenient, but the motherboard headers for the audio jacks are only guaranteed to fit AOpen motherboards.

One surprising feature at this low price is the inclusion of a 300W PSU. There are also options for 350W and 400W should you want to install the maximum number of drives and fans; all are Pentium 4-ready. Build quality is commendable and the 5.25in bays can accept quick-release rails, as well as having screw holes. However, only two sets of rails are bundled.

The Chieftec Black Dragon rivals the H600A for price but, while it beats the AOpen on expansion, it doesn't come with a PSU, leaving the H600A to take the main honours.

### results

<b>OVERALL</b>	○○○○○○○*
<b>FEATURES</b>	○○○○○○○*
<b>EXPANSION</b>	○○○○○○○*
<b>VALUE FOR MONEY</b>	○○○○○○○*



## AOpen HQ45 Pro

**verdict** The lack of cooling potential is a big drawback, making the H600A a much better choice – especially at just £5 more.  
**price** £46 (£54 inc VAT)  
**supplier** dabs.com 0800 138 5182

**A**Open's HQ45 Pro comes in a choice of four colours: aquamarine, blue, green and grey. The letter designation at the end of the model name corresponds to a particular colour so, if you don't fancy the blue highlights on the unit we've reviewed, simply select another model.

Aesthetics aside, the HQ45 Pro uses a traditional layout inside. The 300W PSU is mounted above the motherboard tray, keeping it well out of the way, and seven backplate slots allow a full ATX motherboard to be installed. The chassis' 420mm depth only allows motherboards up to 270mm wide to be installed, although narrower motherboards will allow longer 5.25in drives to be fitted – two of the bays conflict with the motherboard area.

Just three 3.5in bays exist, two of which are available from the front panel. It's a shame that AOpen chose not to use the space below this removable cage, since there's room for a second three-bay cage. Being the Pro version means that the front panel is treated to audio and USB ports. These have headers tailored to AOpen motherboards, like the H600A, but the USB header may well fit other boards.

Build quality isn't the best, but the HQ45's main drawback is cooling. There are no fan mountings at all, which is a major problem when building a high-spec system that requires extra fans. But the good news for AOpen fans is that the H600A costs a mere £5 more, and offers both good expansion and cooling.

### results

<b>OVERALL</b>	○○○○○○○*
<b>FEATURES</b>	○○○○○○○*
<b>EXPANSION</b>	○○○○○○○*
<b>VALUE FOR MONEY</b>	○○○○○○○*



## Chieftec Black Dragon DX-01BD

**verdict** Attractive styling, good layout and plenty of expansion potential make the Black Dragon a fierce contender.  
**price** £49 (£58 inc VAT)  
**supplier** Overclock.co.uk 020 8574 5592

**T**he Black Dragon is the only black chassis on test. Its lockable front door hides all the drives bays and the power buttons, leaving a serious-looking exterior. At 522mm tall, the chassis isn't quite a full tower, but it does offer four 5.25in quick-release bays. Unlike the AOpen H600A, a full set of quick-release rails is included.

Beneath the large bays are two removable 3.5in drive cages capable of holding three drives each. Two of the bays are accessible via the front panel and the lower cage can accept an 8cm fan, which is ideal for cooling hard disks. A further 8cm fan mount resides at the bottom of the chassis for directing cool air across the motherboard. The rear panel will accept two more 8cm exhaust fans, although none is included.

Thanks to the 473mm depth, wide ATX motherboards up to 275mm can be installed. Build quality is well above average, and all edges of the main chassis are rolled for safe assembly.

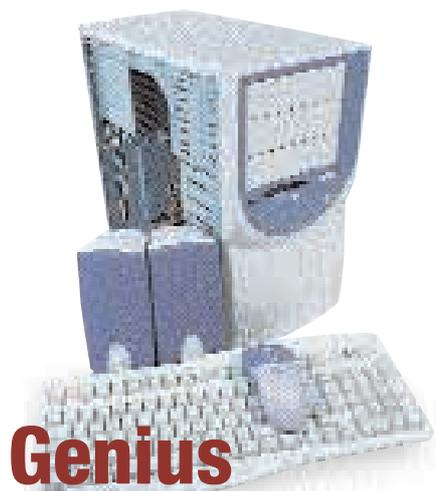
Unfortunately, the removable side panel, which also boasts a lock, doesn't have rolled edges so care is required. Also, you'll have to buy a PSU separately, but at least this provides an opportunity to choose the most suitable one for your specific needs. Chieftec recommends its own 340W PSU, which is Pentium 4-ready and costs £29.

The Black Dragon offers a wealth of expansion possibilities. Even taking the additional cost of a PSU and fans into account, it still represents excellent value for money.

### results

<b>OVERALL</b>	○○○○○○○*
<b>FEATURES</b>	○○○○○○○*
<b>EXPANSION</b>	○○○○○○○*
<b>VALUE FOR MONEY</b>	○○○○○○○*





## Genius Mars GC-9DA

**verdict** A good value-for-money offering, with a surprisingly high-quality mouse and keyboard, but expansion is limited.

**price** £55 (£65 inc VAT)

**supplier** CCL 0845 345 2518

The Mars GC-9DA is an example of a bare bones system; ideal if you're building a PC from scratch without reusing an existing keyboard, mouse and speakers. The mini-tower chassis offers fair expansion, considering its compact dimensions. There are three 5.25in bays, but it's vital to note that with a motherboard installed only one remains full length. Just one of the three 3.5in bays is visible in the front panel, and this is exclusively for a floppy disk drive.

A full complement of seven slots adorns the rear panel, and a generic I/O shield includes cut-outs for integrated game and LAN sockets. Unfortunately, owing to its squat height, one of the Mars' failings is that the PSU is mounted to the side and will cover the processor area on a motherboard. This means that the PSU has to be removed to gain CPU access and could restrict airflow.

The 300W PSU is Pentium 4-ready and offers five peripheral power connectors and two floppy drive connectors. The two fan mounts aren't exactly comprehensive, but they should afford enough airflow in the case, especially if high displacement fans are installed – none is bundled.

Build quality is adequate at the price, and the keyboard and mouse are also of surprisingly good quality. Both have a PS/2 interface and the mouse has a scroll wheel. The speakers don't set the world alight, but can handle Windows sounds. But for this price we're not complaining: the Mars is an excellent budget choice if you want a compact bare bones system.

**results**

<b>OVERALL</b>	○○○○○○○
<b>FEATURES</b>	○○○○○○○
<b>EXPANSION</b>	○○○○○○○
<b>VALUE FOR MONEY</b>	○○○○○○○



## Holly KA-S88WP

**verdict** Good expansion potential, but a lack of fan-mounting points is the Holly's main stumbling block.

**price** £77 (£90 inc VAT)

**supplier** Holly Computers 01375 397220

The first full-tower chassis on test comes from Holly. Despite the KA-S88WP's 620mm height, it only offers one more 5.25in bay than five of the midi-tower chassis on test. Importantly, however, none of the KA-S88WP's bays conflicts with the motherboard area, so full-length drives can be installed without fouling other components.

Like the SuperMicro full-tower, there's just one external 3.5in bay – there are three more inside. Below these is a plastic holder for full-length PCI cards with an 8cm front fan installed. A dust filter prevents the build-up of dust inside the case. At the top rear is a second 8cm fan, but this is the extent of the cooling provision. No more mounting points exist, so if cooling is a priority the Holly isn't the best choice.

In addition, maintenance is hindered by the one-piece cover. Instead of separately removable side panels, the Holly requires six screws and plenty of space to remove the heavy cover.

A 300W PSU is included and is Pentium 4-ready and AMD-approved. The six peripheral power connectors are supplemented by two floppy drive connectors. As with most of the cases on test, there aren't enough connectors to serve every expansion bay.

While the chassis is heavily built and rigid, build quality isn't as good as the SuperMicro; some edges remain sharp, so care is required when installing components. This can be forgiven considering the relatively low price of £77, but if you can afford it the SuperMicro is the better full-tower option.

**results**

<b>OVERALL</b>	○○○○○○○
<b>FEATURES</b>	○○○○○○○
<b>EXPANSION</b>	○○○○○○○
<b>VALUE FOR MONEY</b>	○○○○○○○



## Lian-Li PC-7

**verdict** A luxury chassis for those with more generous budgets, but build quality and great expansion mark it out.

**price** £94 (£110 inc VAT)

**supplier** CCL 0845 345 2518



Lian-Li is one of the better-known Taiwanese chassis manufacturers and has a reputation for its luxury aluminium chassis. The PC-7 has a beautiful brushed aluminium finish, and it doesn't take a moment to discover the terrific build quality and attention to detail.

For example, the front panel clicks in and out of place easily and reveals a coarse filter at the base. This prevents large particles from being sucked into the chassis by the twin 8cm front fans. Beneath this is a bracket containing four USB ports, and above it is a slide-out drive cage with three front panel 3.5in bays. Four 5.25in bays reside at the top and all have finely machined blanking plates.

Inside is another removable cage and, thanks to clever design, five further 3.5in drives can be installed on their sides. The two front fans direct air at this cage, making it ideal for a hard disk array. The final fan mount is also equipped with an 8cm exhaust fan, completing the cooling subsystem.

The motherboard mounting plate isn't removable, but there are plenty of mounting points to accept a plethora of motherboards. The standard seven backplate slots allow full expansion, while the generic I/O shield has cut-outs for all the standard ports as well as integrated LAN.

The PC-7 doesn't come with a PSU, but it's bristling with features and expansion potential. If you want an aluminium chassis, the Lian-Li PC-7 is the one to pick.

**results**

<b>OVERALL</b>	○○○○○○○
<b>FEATURES</b>	○○○○○○○
<b>EXPANSION</b>	○○○○○○○
<b>VALUE FOR MONEY</b>	○○○○○○○





## Scan 2008

**verdict** A respectable budget chassis, thanks to decent bundled extras, but the AOpen H600A is worth the extra expense.  
**price** £39 (£46 inc VAT)  
**supplier** Scan Computers 0870 755 4747

**D**espite being the cheapest case on test, the Scan 2008 is a strong contender. With four 5.25in bays – one more than most midi-towers – and three 3.5in bays, expansion is quite respectable. On top of this, the removable motherboard tray eases initial building and maintenance. It's only a shame the expansion cards have to be removed before swinging the tray out on its hinge.

Surprise extras, considering the low price, are two USB ports and an 8cm fan. Oddly, the USB ports are top-mounted, which could prove awkward in practice. Also, rather than using the usual USB motherboard header, the Scan 2008 uses ten labelled connectors. This means your motherboard manual needs to document the individual header pins.

The 250W PSU seems a tad underpowered, but at least it's Pentium 4-ready and is out of the way above the motherboard. Those wanting to install wide motherboards will also appreciate the extra space offered by the 515mm-deep chassis. This should mean that EIDE and floppy connectors remain accessible and that power cables won't obscure the memory or CPU sockets in the final build.

Thanks to the removable front panel, the side panel can be removed by sliding it towards the front. This is handy for quick access to the interior without having to move the chassis from its current location.

The 2008 is a good choice if you're on a budget, but we recommend stretching £12 more to the AOpen H600A, which is more solid and has greater expandability.

### results

<b>OVERALL</b>	○○○○○○
<b>FEATURES</b>	○○○○○○
<b>EXPANSION</b>	○○○○○○
<b>VALUE FOR MONEY</b>	○○○○○○



## Scan Alumax Aluminium

**verdict** Well built and there are some innovative features, but it's overpriced compared to the Lian-Li PC-7.  
**price** £159 (£187 inc VAT)  
**supplier** Scan Computers 0870 755 4747

**T**he Alumax is similar in appearance to the Lian-Li PC-7 in that it has an unlacquered, brushed aluminium finish. Build quality also matches the PC-7, but there are a couple of design flaws.

For instance, there are no vent holes in the front panel for the 8cm front fan. Things improve at the chassis' rear, with dual 6cm fans in place to push hot air away from the interior. In addition, a removable panel (which is located in front of the motherboard area) has a dozen slots to mount extra fans on, but again there are no corresponding vents in the side panel.

Expansion-wise, the Alumax has four 5.25in bays and three 3.5in bays in the front panel. Inside, a removable drive cage can hold three more hard disks and is cooled by the front fan.

At the base of the front is a port replicator comprising two USB sockets, one FireWire connector, a volume control and all the ports you'd find on a standard sound card. This is one of the most innovative features we've seen, and cables are thoughtfully included to connect the 'real' ports from the back panel.

Avid upgraders will also appreciate the slide-out motherboard tray. Just three screws need to be removed, along with all connecting cables, before the motherboard – complete with expansion cards – can be extracted.

Like the Lian-Li and Chieftec chassis, there's no PSU, and at £159 this is something we'd expect to be included. Unfortunately for the Scan Alumax, the Lian-Li PC-7 costs £65 less and is a better choice.

### results

<b>OVERALL</b>	○○○○○○
<b>FEATURES</b>	○○○○○○
<b>EXPANSION</b>	○○○○○○
<b>VALUE FOR MONEY</b>	○○○○○○



## SuperMicro SC760-P4

**verdict** Excellent expansion and cooling potential, but the high price will rule the SC760-P4 out for most buyers.  
**price** £140 (£165 inc VAT)  
**supplier** Simply 0870 727 2100

**S**uperMicro is perhaps best known for its motherboards, but the firm's server chassis range shows its commitment to the enterprise. Aimed at mission-critical Pentium 4-based servers and workstations, the SC760-P4 features a 300W Pentium 4-ready PSU with a redundant two-fan cooling solution. A 400W unit is an option for use with dual Xeon motherboards.

Cooling is a major aspect of the SC760-P4, with no less than ten fan-mounting points. Two fans are included: one 12cm and one 9cm. The other eight 8cm fans can be bought at almost any computer retailer and, thanks to the wide chassis, four can be mounted to cool the 5.25in bays – a unique feature in this Labs. The three front fan locations benefit from a filter, which prevents dust being sucked into the chassis. Handily, it's removable for cleaning.

Expansion is easily the best on test, with six 5.25in bays in the front panel and a single one above the PSU. One 3.5in bay is located above the large bays, and inside there are a further two. Like the Holly full-tower, it's a shame that the space below the existing drive bays isn't fully utilised – several more hard disk cages could have been installed. But the nine drive bays should be enough for most applications.

We've no complaints with build quality, but at £140 we shouldn't have. If you want to buy a full tower for server or workstation use, the SC760-P4 is a good choice. For less strenuous use, take a look at the Lian-Li PC-7.

### results

<b>OVERALL</b>	○○○○○○
<b>FEATURES</b>	○○○○○○
<b>EXPANSION</b>	○○○○○○
<b>VALUE FOR MONEY</b>	○○○○○○