

# Power-packed Centrino notebooks

Starbucks, here we come! We look at the new breed of wireless-capable notebooks

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Intel's Centrino branding heralds the start of a new era in mobile computing. You'll be able to continue working while at the driving range, on a diving board, in the middle of a greenhouse, building site or sports stadium. Never again will you have to stop work simply because you have some leisure time.

At least, that's what Intel's adverts seem to be saying. At the moment, the reality is some way from that with only the odd airport, coffee shop and hotel acting as hotspots.

All that is set to change, though. Westminster council has recently announced that parts of Soho will be given blanket coverage from an 802.11b network to help its employees keep in touch when working in that area.

Assuming the council can sort out the conflicting channels, both within its own network and with those freelance networks already in place, it could open the system up to public use. If it works, the idea is likely to spread elsewhere, both within the capital and to other major towns.

With this in mind and given the new Intel chipset, processor and wireless combination, we've looked at 12 machines with the new

specifications (see *What is Centrino anyway?* on p108). One of the highlights of machines with Centrino branding is extended battery life, thanks to the new Pentium-M processor, which draws less power than the Pentium 4-M chips used previously. This enabled one of the machines to notch up an amazing six hours in our light-use battery-life test.

If you like the idea of going wireless, read on to find the best notebook for the job.

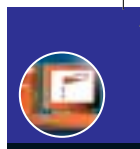
## WIRELESS SPECIAL

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## CONTRIBUTORS

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Burridge, Tim Danton





## RATING FEATURES

As with buying a desktop PC, speed shouldn't be your first consideration when choosing a notebook. You'll be spending a huge amount of your time staring at the screen and tapping at the keyboard, while an extra 20GB of hard disk space could prove much more useful in two years' time than saving a few milliseconds when opening up Word.

## Ergonomics

We give ergonomics the biggest weighting when working out each machine's features tally. Most important of all is the screen: not only its size, but also its resolution. Although a 15in screen with a 1,024 x 768 resolution is a nice luxury, you won't see many benefits over a 14.1in TFT with the same resolution. If a chassis includes enough space for a 15in screen, we prefer 1,400 x 1,050 pixels due to the extra space it gives you on the Desktop – Toshiba even manages to squeeze 1,600 x 1,200 from its screen.

Remember that if you find the system text is too small, you can adjust the dpi rating of Windows. Just go into the Display Properties, click Settings, click Advanced and then choose Large size (120dpi) as the dpi setting.

We also give each TFT a rating for quality, which incorporates the evenness of its backlighting, its viewing angles and its contrast. A couple of the screens this month proved disappointing, with off-white displays and questionable contrast. However, gamers should note the lack of advanced technology like Super-IPS; none of these screens can match the latest desktop TFT screens for response times.

The keyboard and 'mouse' combination are the final part of the ergonomics equation. Again, we give these a rating, this time based on feel and layout. To see each notebook's at-a-glance ergonomics score, look at p104. For a more detailed breakdown, see the table below.

## Hardware and software

All but two of the notebooks here include a combo DVD/CD-RW drive, and we award points for speed of writing and rewriting. Some also offer the option to

step up to a DVD writer or replace the optical drive with a second hard disk or battery.

As you'd expect, the larger the hard disk the more points a machine receives. Extra connectivity features, like Bluetooth, gain each machine points, as do the variety and number of ports.

For software, we take account of both the operating system used (Windows XP Professional scores more due to its more advanced features) and any full programs bundled with the machine.

## Build quality and style

We give each machine a rating for build quality and style. For build quality, we examine how well protected the screen and hard disk are, and also look for any potential weaknesses in the design. Style is a much more subjective rating, so gets a smaller weighting in the overall features score. To see exactly what our panel of judges thought, look at the table below.

## Weight and expandability

Although weight is by no means as crucial for general-purpose notebooks as it is for ultra portables, this should still form part of any purchasing decision. After all, you'll still have to carry it around your home or office and on those occasions when travelling.

The other side of the coin is expandability; sometimes, you can use the drive bay to add another hard disk, an upgraded optical drive or even a battery. We take the number of options into account and any other expansion opportunities such as adding more memory.

## Warranty

The amount of points each machine receives for the warranty depends on the length of the cover and the type. For example, a collect-and-return warranty has obvious advantages over return-to-base, where you must pay for sending the machine back to the vendor.

International cover gains added points, as does the inclusion of accidental damage cover. ACi stands out this month for providing international insurance as well as the warranty. This covers not

## THE AWARDS

We usually give three awards to manufacturers.

The most prestigious is the Labs Winner award.

This goes to the PC or peripheral that offers the best combination of performance, features and value this month.

One PC, printer or motherboard doesn't necessarily suit all. We also give a Recommended award – sometimes two

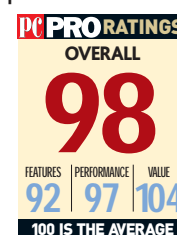
– to the PC or peripheral that might be better suited to differing needs.

In certain Labs, we also give a self-explanatory Best Value award.



## LABS RATINGS: A BRIEF EXPLANATION

We rate PCs and peripherals in Labs differently to equipment tested elsewhere in *PC Pro*. Instead of star ratings, we award each entrant a number relative to 100, where 100 is the average. So a performance score of 125 means a PC was 25 per cent faster than the average, a features score of 110 means it earned 10 per cent more feature points. The overall score combines a weighting of these two results, and price where appropriate, to give an overall score that is again relative to the average.



only accidental damage, but also theft.

Finally, we give bonus points to each manufacturer that performed well in our most recent Notebook Reliability and Service Awards (see *issue 97*, p177).

## Battery life and speed

We pushed all 12 machines to the limit for both performance and for battery life. See over the page for details of how we put the notebooks through their paces.

QUALITY RATINGS	Acer TravelMate 803LCi	ACi Centurion M3000N	AJP M3000N	Asus M2400N	Evesham Voyager Xs 1.6 Pro	Fujitsu Siemens Lifebook S-6120	Hi-Grade Notino C1000	Multivision Nexus CT	Rock Pegasus CT	Samsung X10 XTC 1600	Sony VAIO PCG-Z1SP	Toshiba Satellite Pro M10
TFT	4.5	4	4	4.5	4.5	5	4	4	4.5	5.5	5	5
Keyboard	5.5	3.5	3.5	4	4	5	3.5	3.5	2.5	5.5	4.5	5
Mouse	4	5	3	5	5	5.5	5.5	5	4.5	6	5.5	3.5
Build	5	3.5	4	5.5	5	4.5	4	3.5	3	5	5	4.5
Style	4.5	4	4	5	5	5.5	4.5	4	3	6	4.5	5

All scores are out of six



# How we test

## 2D PERFORMANCE

We use our own suite of real-world benchmarks to test each notebook's 2D speed. These are based on applications such as Microsoft Word XP, Excel XP, Adobe Photoshop 6.01, CorelDRAW 9 Essentials and Cleaner 5.01. Each score is relative to a 2GHz Pentium 4 Dell desktop PC with 256MB of PC800 RDRAM – if a notebook scores 1.35, that means it was 35 per cent faster than the Dell reference PC overall. For full details on the benchmarks, see issue 100, p58.

## 3DMARK2001 SE

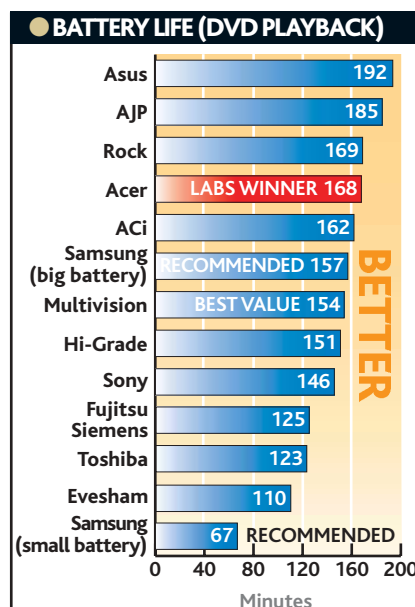
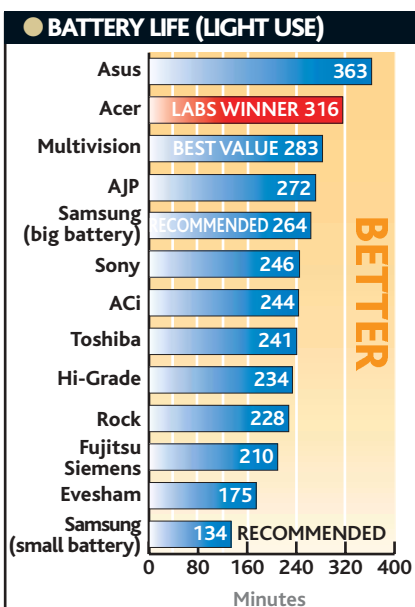
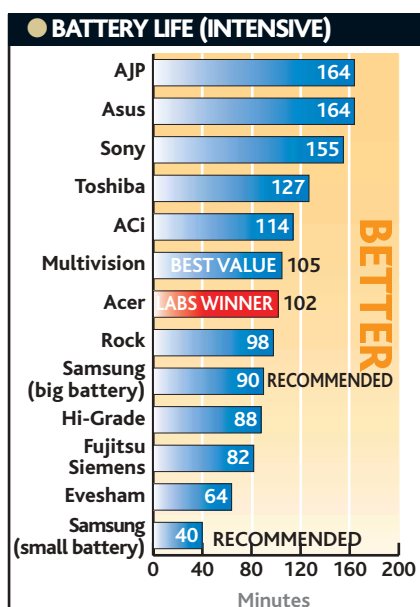
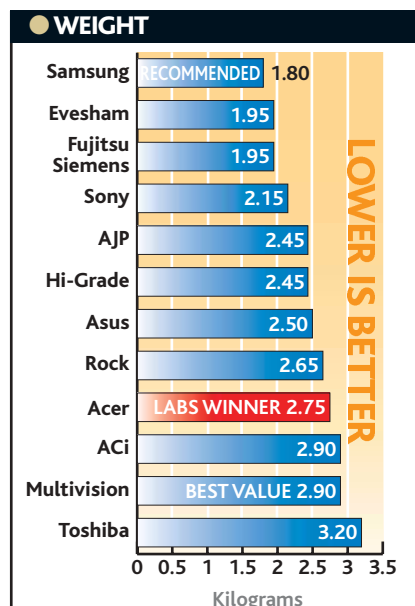
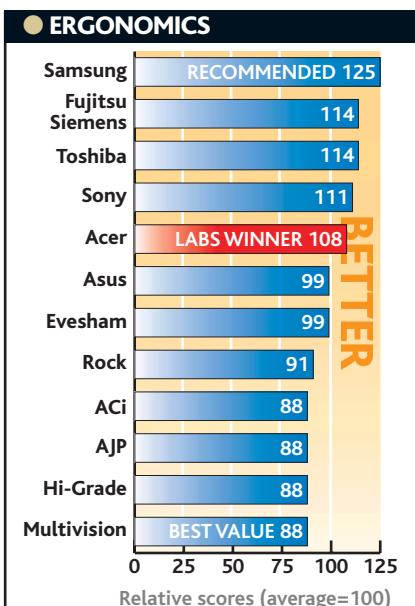
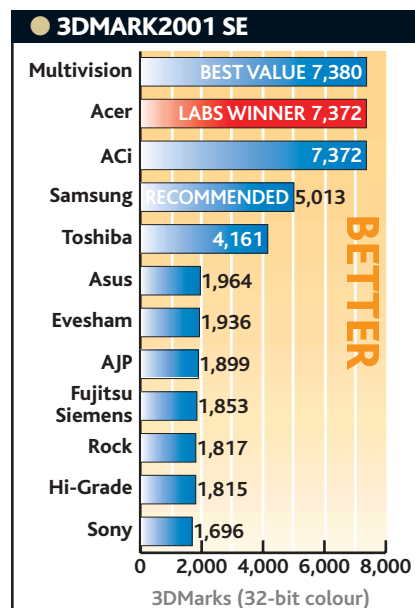
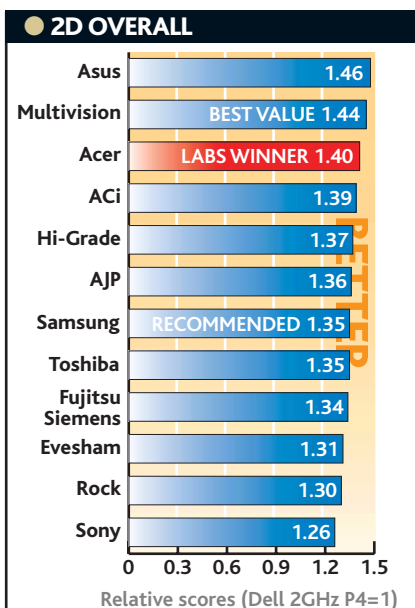
We test each notebook's 3D performance using 3DMark2001 SE: first at 1,024 x 768 resolution in 32-bit colour; with compressed textures and double buffering; and at the same resolution, but dropping to 16-bit. We run each test ten times to get as accurate a score as possible. Only the 32-bit scores are shown here.

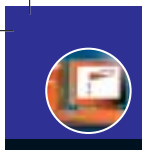
## ERGONOMICS

This score takes into account the screen's size and quality, and the usability of the keyboard and 'mouse'. See p103 for more details.

## BATTERY TESTS

We use three battery tests. Our intensive test pushes the notebook to its maximum using our Excel Business and Word benchmarks. We disable all power-management features and set the brightness to maximum – this gives us the minimum time a notebook will last. We also force each notebook to repeatedly play a 30-minute DVD video until the battery gauge drops to 10 per cent. To see the maximum time a notebook will last, we set the brightness to low and just run a timer in the background; this writes to the hard disk every minute.





## THE LABS Centrino notebooks

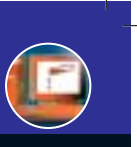
### FEATURE TABLE



	Acer TravelMate 803LCi	ACI Centurion	AJP M3000N	Asus M2400N	Evesham Voyager Xs 1.6 Pro	Fujitsu Siemens Lifebook S-6120
<b>Overall score</b>	<b>107</b>	<b>103</b>	<b>94</b>	<b>100</b>	<b>98</b>	<b>103</b>
Manufacturer's code	X	X	X	M2416N-C4W	X	X
Price <sup>1</sup> (inc VAT)	£1,359 (£1,597)	£1,499 (£1,761)	£1,325 (£1,557)	£1,599 (£1,879)	£1,299 (£1,526)	£1,699 (£1,996)
Cost of delivery (inc VAT)	£6 (£7)	£20 (£23.50)	£29 (£35)	£10 (£12)	£34 (£40)	£10 (£12)
Supplier	dabs.com (web only)	ACI 020 8830 1958	AJP Computers 020 8208 9744	Scan 0870 755 4747	Evesham Technology 0870 728 7070	Bechtel Direct 01249 467900
Supplier's website	www.dabs.com/2FVCWS	www.aciplc.com	www.ajp.co.uk	www.scan.co.uk	www.evesham.com	www.bechtle.co.uk
Manufacturer's website	www.acer.co.uk	www.aciplc.com	www.ajp.co.uk	www.asus.com.tw	www.evesham.com	www.fujitsu-siemens.co.uk
Basic warranty <sup>2</sup>	2yrs C&R	1yr C&R, 1yr international insurance <sup>3</sup> , lifetime labour	1yr RTB, 2yrs RTB (labour only)	2yrs C&R	2yrs RTB <sup>4</sup>	3yrs international C&R
Width x depth (mm)	330 x 280	332 x 275	311 x 260	305 x 250	296 x 240	292 x 235
Height including feet (mm)	31	36	34	34	30	35
System weight with battery (kg)	2.75	2.90	2.45	2.50	1.95	1.95
<b>CORE COMPONENTS</b>						
Processor type	1.6GHz Intel Pentium-M	1.5GHz Intel Pentium-M	1.6GHz Intel Pentium-M	1.6GHz Intel Pentium-M	1.6GHz Intel Pentium-M	1.6GHz Intel Pentium-M
Motherboard chipset	Intel 855PM	Intel 855PM	Intel 855GM	Intel 855GM	Intel 855GM	Intel 855GM
RAM fitted	512MB PC2100	512MB PC2100	512MB PC2100	512MB PC2100	640MB PC2100	256MB PC2100
Maximum RAM in current configuration	512MB	512MB	512MB	512MB	640MB	1.25GB
SODIMM sockets free/total	0/1	0/2	0/1	0/1	0/1	1/2
<b>DISPLAY</b>						
Display size (in)	15	15	14.1	14.1	13.3	13.3
Native resolution	1,400 x 1,050	1,400 x 1,050	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768
Graphics chipset	ATI Mobility Radeon 9000	ATI Mobility Radeon 9000	Intel 855GM	Intel 855GM	Intel 855GM	Intel 855GM
Video memory	64MB	64MB	8-64MB shared	8-64MB shared	8-64MB shared	8-64MB shared
Other output	VGA, S-Video out	VGA, S-Video out	VGA	VGA	VGA	VGA
<b>DRIVES</b>						
Hard disk (make and model)	Hitachi DK23EA-40	Hitachi DK23EB-40	Hitachi Travelstar 40GN	Hitachi Travelstar 40GN	Toshiba MK8025GAS	Fujitsu MHS2040AT
Speed (rpm)	4,200	5,400	4,200	4,200	4,200	4,200
Removable by user	✓	✓	✓	✓	✓	✓
Nominal capacity	40GB	40GB	40GB	40GB	80GB	40GB
Formatted capacity	37.2GB	37.2GB	37.2GB	37.2GB	74.5GB	37.2GB
Floppy disk drive	X	X	USB option (£25)	X	X	X
Optical drive and speed (DVD read/CD write/re-write/CD read)	DVD/CD-RW combo: QSI SBW-242 (8x DVD, 24x/10x/24x CD-RW)	DVD/CD-RW combo: Toshiba SD-R2412 (8x DVD, 24x/10x/24x CD-RW)	DVD-ROM: QSI SDR-083 (8x/24x)	DVD/CR-RW combo: Toshiba SD-R2412 (8x DVD, 24x/10x/24x CD-RW)	DVD-ROM: Toshiba SD-C2612 (8x/24x)	DVD/CD-RW combo: Toshiba SD-R2412 (8x DVD, 24x/10x/24x CD-RW)
Drive options (price exc VAT) POA = price on application	DVD-RW (EPOA), second hard disk (40GB, £199), second battery (EPOA), weight saver (inc)	DVD-RW (EPOA)	DVD-RW (£135), second hard disk (40GB, £149), second battery (£99)	DVD-ROM (£55), CD-ROM (£55)	X	Second hard disk (40GB, £175), second battery (£86)
<b>BATTERY</b>						
Battery technology	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion
Capacity of battery (mAh)	4,400	4,300	4,400	4,400	3,600	4,000
Price of replacement battery (exc VAT)	£85	£89	£99	£75	£68	£86
<b>COMMUNICATIONS</b>						
Modem (speed)	Ambit (V.92)	SmartLink (V.90)	Agere (V.92)	Lucent (V.92)	Lucent (V.92)	Agere (V.92)
Network (speed)	Broadcom 440x (10/100)	Realtek RTL8139 (10/100)	Intel PRO/100 VM (10/100)	Realtek RTL8139 (10/100)	Realtek RTL8139 (10/100)	Realtek RTL8139 (10/100)
Wireless technologies	802.11b, Bluetooth	802.11b, Bluetooth	802.11b, Bluetooth	802.11b	802.11b	802.11b, Bluetooth
Upgrade path to 802.11a/g	To be decided	✓/ Ready	✓/ Ready	X	X	✓/ Ready
Antenna location	Screen lid	Chassis	Screen lid	Chassis	Screen lid	Screen lid
<b>PORTS</b>						
PC Card slots	One Type II	One Type II	One Type II	One Type II	One Type II	One Type II
Other slot	Smart card	SD	X	X	X	X
USB 2	4	3	4	2	3	2
FireWire (IEEE-1394)	One 4-pin	One 4-pin	One 4-pin	One 4-pin	One 4-pin	One 4-pin
Infrared	✓	✓	✓	✓	✓	✓
Serial	X	X	X	X	X	X
Parallel	✓	✓	✓	✓	X	X
PS/2	X	X	X	X	X	X
Other ports	X	X	X	X	Optical drive port	X
Pointing device type	Touchpad	Touchpad	Touchpad	Touchpad	Touchpad	Touchpad
Docking station options (price exc VAT)	Port replicator (£85)	Port replicator (£129)	Port replicator (£125)	Port replicator (£69)	Port replicator (£65)	Port replicator (£45)
<b>OTHER PERIPHERALS</b>						
Sound chipset	Realtek AC97	Realtek AC97	SigmaTel C-Major	SigmaTel C-Major	SigmaTel C-Major	SigmaTel C-Major
Speakers location	Chin	Front left and right sides	Front left and right sides	Front left and right sides	Front centre (mono)	Back left and right sides
Internal microphone	✓	X	✓	✓	✓	X
Carry case supplied	X	✓	✓	X	X	X
Extras	X	Free corporate imaging	X	PC Card card reader (Memory Stick, SmartMedia, SD, MMC)	PC Card card reader (Memory Stick, SmartMedia, SD, MMC)	Smart card PC Card reader
<b>SOFTWARE SUPPLIED</b>						
Operating system	Windows XP Pro SP 1	Windows XP Pro SP 1	Windows XP Pro SP 1	Windows XP Pro SP 1	Windows XP Pro SP 1	Windows XP Pro SP 1
Recovery/Windows CD provided	Installation CD	Installation CD	Installation CD	Recovery CD	Installation CD	Installation CD
Main titles	Norton AntiVirus	Microsoft Works 7, Norton AntiVirus	X	Asus DVD Player, PC-cillin 2002, IBM ViaVoice	BigFix	Plugfree 1.2 Bluetooth Suite, DeskView manageability software, Smart card security software

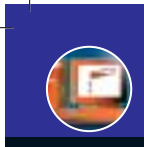
<sup>1</sup> Prices correct at time of going to press. <sup>2</sup> Warranty is parts and labour, UK mainland only, unless otherwise stated. <sup>3</sup> Includes accidental damage and theft. <sup>4</sup> Includes accidental damage.





Hi-Grade Notino C1000	Multivision Nexus CT	Rock Pegasus CT	Samsung X10 XTC 1600	Sony VAIO PCG-Z1SP	Toshiba Satellite Pro M10
<b>95</b>	<b>104</b>	<b>96</b>	<b>104</b>	<b>101</b>	<b>99</b>
C1000-1600	X	PCT-1.5	X	X	PS630E-G206C-EN
£1,699 (£1,996)	£1,199 (£1,409)	£1,149 (£1,350)	£1,735 (£2,039)	£1,599 (£1,879)	£1,575 (£1,851)
£29 (£34)	£39 (£46)	£20 (£23.50)	£6 (£7)	£6 (£7)	£6 (£7)
Hi-Grade 020 8532 6111	Multivision 0870 220 2822	Rock 0870 990 9090	dabs.com (web only)	dabs.com (web only)	dabs.com (web only)
www.higrade.com	www.multivision.co.uk	www.rockdirect.com	www.dabs.com/ZDDVWS	www.dabs.com/ZFKQWS	www.dabs.com/ZFVDWS
www.higrade.com	www.multivision.co.uk	www.rockdirect.com	www.samsungelectronics.co.uk	www.vaio.sony-europe.com	www.toshiba.co.uk
2yrs international C&R <sup>4</sup>	1yr C&R, 2yrs RTB (labour only)	3yrs C&R	1yr 72-hour C&R	1yr RTB	1yr RTB
317 x 275	332 x 275	317 x 277	320 x 260	318 x 247	331 x 293
28	36	36	28	24-39	39
2.45	2.90	2.65	1.80 <sup>5</sup>	2.15	3.20
1.6GHz Intel Pentium-M	1.6GHz Intel Pentium-M	1.5GHz Intel Pentium-M	1.6GHz Intel Pentium-M	1.5GHz Intel Pentium-M	1.6GHz Intel Pentium-M
Intel 855GM	Intel 855PM	Intel 855GM	Intel 855PM	Intel 855PM	Intel 855PM
512MB PC2100	512MB PC2100	512MB PC2100	512MB PC2100	512MB PC2100	512MB PC2100
1.5GB	512MB	1.5GB	1.5GB	1.5GB	1.5GB
1/2	0/2	1/2	1/2	1/1	1/2
14.1	15	14.1	14.1	14.1	15
1,024 x 768	1,400 x 1,050	1,024 x 768	1,024 x 768	1,400 x 1,050	1,600 x 1,200
Intel 855GM	ATI Mobility Radeon 9000	Intel 855GM	Nvidia GeForce4 440 Go	ATI Mobility Radeon	Nvidia GeForce4 420 Go
8-64MB shared	64MB	8-64MB shared	64MB	16MB	32MB
VGA	VGA, S-Video out	VGA, S-Video out	VGA, S-Video out	VGA	VGA, composite out
Hitachi DK23EA-60	Fujitsu MHS2060AT	Hitachi DK23EA-40	Hitachi Travelstar 40GN <sup>6</sup>	Hitachi DK23EA-60	Toshiba MK6022GAX
4,200	4,200	4,200	4,200	4,200	5,400
✓	✓	✓	✓	X	✓
60GB	60GB	40GB	30GB <sup>6</sup>	60GB	60GB
55.8GB	55.8GB	37.2GB	27.9GB <sup>6</sup>	55.8GB	55.8GB
USB option (£45)	USB option (£29)	X	X	X	X
DVD/CD-RW combo: Matshita UJDA745	DVD/CD-RW combo: Lite-On LSC-24081	DVD/CD-RW combo: QSI SBW-242	DVD/CD-RW combo: Samsung SU-408B	DVD/CD-RW combo: Matshita UJDA745	DVD/CD-RW combo: TEAC DW-224E
(8x DVD, 16x/10x/24x CD-RW)	(8x DVD, 24x/10x/24x CD-RW)	(8x DVD, 24x/10x/24x CD-RW)	(8x DVD, 8x/8x/24x CD-RW)	(8x DVD, 16x/10x/24x CD-RW)	(8x DVD, 24x/10x/24x CD-RW)
X	DVD-RW (EPOA)	Second hard disk (40GB, £149)	X	X	DVD-RW/RAM (£299)
Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion
3,600	4,300	4,400	2,200 and 4,400	4,400	6,600
£95	£79	£99	£99	£221	£75
Agere (V.92)	SmartLink (V.90)	SmartLink (V.90)	Sens LT56ADW (V.90)	CXT AC-link (V.90)	Toshiba (V.90)
Intel PRO/100 VE (10/100)	Realtek RTL8139 (10/100)	VIA VT6105 (10/100)	3Com 3C920 (10/100)	Intel PRO/100 VE (10/100)	Intel PRO/100 VE (10/100)
802.11b	802.11b, Bluetooth	802.11b	802.11b	802.11b, Bluetooth	802.11b, Bluetooth
✓/ Ready	✓/ ✓	✓/ Ready	✓/ X	✓/ Ready	✓/ Ready
Both	Chassis	Screen lid	Screen lid	Chassis	Screen lid
One Type II	One Type II	One Type II	One Type II	One Type II	Two Type II
X	SD	Card reader (MS, SM, SD, MMC)	Memory Stick	Memory Stick	SD
3	3	3	2	2	2
One 4-pin	One 4-pin	One 4-pin	One 4-pin	One 4-pin	One 4-pin
✓	✓	✓	X	X	✓
X	X	X	X	X	X
X	✓	X	X	X	✓
X	X	X	X	X	X
X	X	X	Optical S/PDIF out	X	X
Touchpad	Touchpad	Touchpad	Touchpad	Touchpad	Touchpad and trackpoint
Port replicator (£85)	Port replicator (£49)	Port replicator (£39)	Port replicator (£99)	Port replicator (£129)	Port replicator (£125)
Realtek AC97	Realtek AC97	SigmaTel C-Major	Crystal AC97	Yamaha AC-XG	SoundMAX
Back left and right sides	Front left and right sides	Back left and right sides	Front wrist rest	Rear of base	Rear of base
✓	X	X	X	X	✓
✓	✓	✓	X	X	X
X	X	X	External battery charger	X	X
Windows XP Home SP 1	Windows XP Home SP 1	Windows XP Pro SP 1	Windows XP Pro SP 1	Windows XP Pro SP 1	Windows XP Pro SP 1
Recovery CD	Recovery CD	Both	Installation CD	Installation CD	Installation CD
Microsoft Works 7, Panda Antivirus	Lotus SmartSuite Millennium Edition	Ability Office 2002, Panda Antivirus	Microsoft Works Suite 2002, MGI VideoWave IV SE, MGI PhotoSuite III SE	VAIO World, Adobe Photoshop Elements, Adobe Premiere 6 LE, Norton AntiVirus	Bluetooth software

<sup>5</sup> Weight with small battery; the X10 weighs 2kg with the extra-life battery. <sup>6</sup> 60GB drive will be shipped.



# Acer TravelMate 803LCi



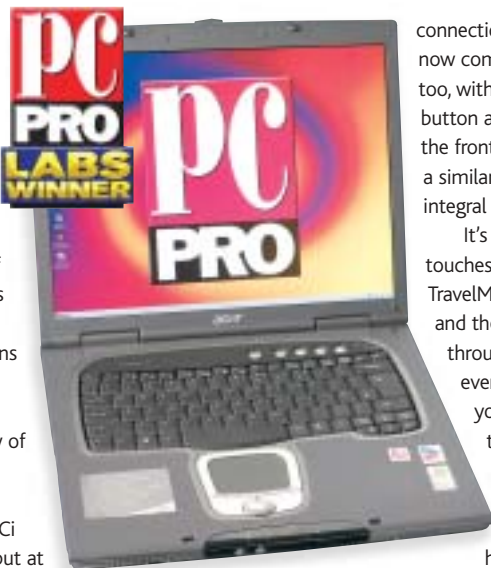
**PRICE** £1,359 (£1,597 inc VAT)

**SUPPLIER** [www.dabs.com/2FVCWS](http://www.dabs.com/2FVCWS)

**VERDICT** This notebook has everything, from superb 2D and 3D performance to great design. Add the plentiful features and it's an indisputable bargain for £1,359.

The TravelMate 803LCi was one of the first Centrino notebooks through our doors (see *issue 103, p58*) and it set an impressive standard for others to follow. As yet, no-one has been able to match it and, in spite of some stiff competition this month, it retains its A List title. We've always been fans of its smart, business-like looks, comfortable ergonomics and wide array of features, and this meeting only confirms our feelings.

It's true that the 803LCi isn't as portable as some, but at 2.75kg it's lighter than it looks. It has one of the largest footprints here, and that extra space gives you a good number of ports, including a parallel connector and four USB 2



connections. Bluetooth now comes as standard too, with its own recessed button and indicator on the front panel, next to a similar one for the integral 802.11b.

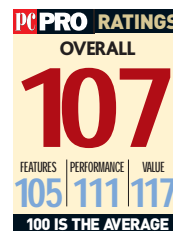
It's these little touches that make the TravelMate so appealing, and the superb design throughout means everything is where you need it to be – the infrared port sits on the front of the machine, as does the headphone socket

at the front on the left side. The curved keyboard is well laid out too and surprisingly comfortable in use, with its chunky spacebar and generously proportioned keys.

There may be better performers in specific areas – for example, the Asus lasted for an extra hour over the TravelMate's 102 minutes in our intensive-use battery test – but the Acer is a great all-rounder. Not only do you get excellent 2D performance, with the Multivision and Asus being only slightly faster, but 3D performance is impressive too. Should you be tempted by the prospect of a little online game slaying in a coffee shop, it's more than capable – a Mobility Radeon 9000 helped it reach a 3DMark2001 SE score of 8,047 in 16-bit.

The 15in screen is a little on the dark side, but it's an otherwise crisp and detailed image, and with 1,400 x 1,050 pixels only the Toshiba gives you more Desktop space. DVDs look good too, and the combo drive also acts as a nippy 24x/10x CD-RW. If that's not enough, the drive bay will also accommodate a good selection of other modules, including a DVD-RW.

The screen isn't quite as well protected as we'd like, so you should invest in a padded case, but with a two-year, collect-and-return warranty you're well covered if something does go wrong. Were it not for the Multivision's amazing price, the Acer would be taking the Best Value award as well as the Labs Winner title.



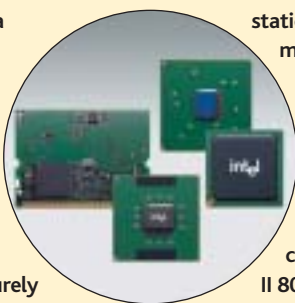
## What is Centrino anyway?

We explore the reality behind the marketing

To get the Centrino badge, a notebook must contain three components: the Intel Pentium-M processor, Intel 855 family chipset and Intel PRO/Wireless 2100 Network Connection. Your first reaction to this, unless you work for Intel, was probably the same as ours: surely Intel is just being greedy and trying to get as much money as it can?

We're not so innocent as to believe this wasn't one of the biggest factors in Intel's decision, but fortunately there are benefits for consumers too.

A key factor is the amount of testing and research Intel has done to ensure a Centrino notebook works out of the box in wireless-enabled areas. Long before Centrino was officially released, Intel was working with major network service providers, such as BT Openzone, Megabeam (which runs hotspots in Paddington



station, London City Airport and many more UK locations) and STSN (which specialises in conference technology).

As part of our recent Wireless hotspot feature (see *issue 104, p167*), we found co-operation was certainly overdue. Using a Type II 802.11b card from a lesser-

known brand, we experienced several problems trying to access the Web at wireless-enabled hotspots. However, if your card (or brand of integrated adaptor) is better known, the technical support staff should be able to help you easily.

Easy wireless connectivity alone can't justify the Centrino brand, but it's backed up by a great processor. We covered the technical details of the Pentium-M three months ago (see *issue 103, p59*), but the best way to think of it is as a combination of the Pentium III-M and the Pentium 4-M.

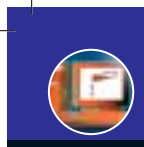
It sounds like a step backwards, but

you get more performance per clock cycle (courtesy of the Pentium III), while also benefiting from a quad-pumped 400MHz front side bus and support for SIMD and SIMD2 instructions. The results are clear from our benchmarks – a 1.6GHz Centrino notebook will almost always outperform a 2.4GHz Pentium 4-M notebook.

In combination with the Intel 855 chipset (be it the 855GM, which includes Intel's own graphics, or the 855PM, which needs a complementary graphics adaptor), this provides excellent battery life too. For the first time, we're seeing a standard battery life of more than six hours.

You can see the Centrino badge as a pretty safe guarantee, but don't be completely taken in by the marketing. IBM has produced the stunning ThinkPad T40p (see *p117*) based on the Pentium-M but with support for 802.11a. And Centrino-branded notebooks won't get support for 802.11a until later this year.

TIM DANTON



# ACi Centurion

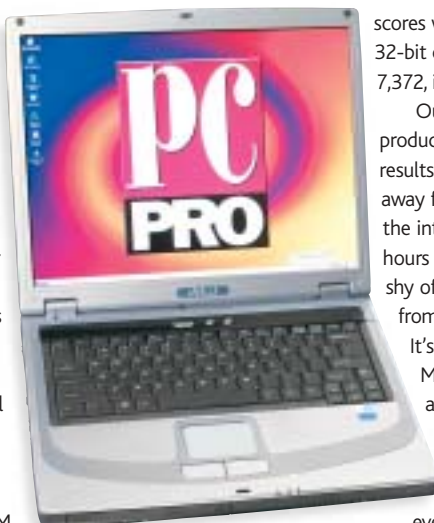
**PRICE** £1,499 (£1,761 inc VAT)

**SUPPLIER** ACi 020 8830 1958

**VERDICT** The Centurion's great warranty and free corporate imaging make it a compelling choice for businesses, but the near-identical Multivision Nexus offers better value.

**W**hile most manufacturers provide either return-to-base or collect-and-return warranties this month, ACi has gone an extra step. As well as a year's collect-and-return cover (combined with lifetime labour cover), it includes an international insurance package covering both accidental damage and theft.

There's plenty to protect too. A 1.5GHz variant of the Pentium-M processor along with 512MB of memory – unfortunately filling both of the available SODIMM sockets – pushed the ACi to 1.39 in our 2D benchmarks. Thanks to the ATi Mobility Radeon 9000 graphics chip, the 3DMark2001 SE



scores were equally impressive. In 32-bit colour, the ACi managed 7,372, increasing to 7,980 in 16-bit.

Our battery life tests produced equally compelling results. The Centurion battled away for just under two hours in the intensive test and almost five hours in light use – this was still shy of the amazing six hours from Asus' machine, though. It's also heavier than the M2400N, weighing 2.9kg, and consequently loses out on portability.

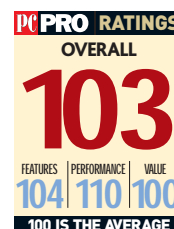
As the photographs show, the Centurion has even more in common with the Multivision Nexus – only the colour scheme has changed. In particular, they share the same screen and keyboard. This is no bad thing: the screen's 15in diagonal contains 1,400 x 1,050 pixels, and good brightness levels help to make

up for lacklustre viewing angles. It isn't the best keyboard in the world, tending to sag in the middle, but it's reasonably well laid out apart from the occasional oddly placed key.

Where Multivision goes big with a 60GB hard disk, ACi is more conservative and includes a 40GB drive. This should be large enough, but there's a DVD/CD-RW combo drive on hand anyway. This Toshiba unit, capable of burning CD-Rs at a nippy 24x, can even be upgraded to a DVD-RW drive.

We were also pleased to see Bluetooth to accompany the infrared port and 802.11b adaptor, and the WLAN can be upgraded to new standards as they become available. Add three USB 2 ports, FireWire and a parallel port, and this notebook is undeniably well connected.

But the real trick up ACi's sleeve is free corporate imaging. This means you can have your own design printed on the lid, helping to boost security (who would steal a notebook with your company logo on?) and branding. Unlike Multivision, this machine also includes Windows XP Professional. Still, it's questionable whether the Centurion justifies its £300 premium over the Nexus. For home users, the answer is surely no, but for businesses the Centurion is a safer bet.



# AJP M3000N

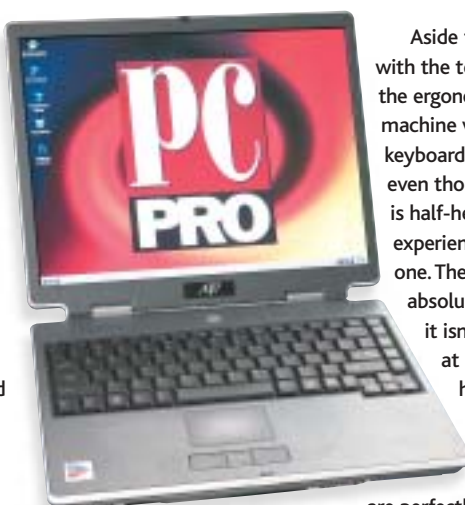
**PRICE** £1,325 (£1,557 inc VAT)

**SUPPLIER** AJP Computers 020 8208 9744

**VERDICT** It looks good, especially when closed, but with average performance and features there's nothing that sets the M3000N apart from the Centrino crowd.

**T**he M3000N is styled to reflect the popularity of Apple's PowerBook range, with a silver lid and white highlights around the edges. Unfortunately, the silver is simply painted plastic rather than real titanium, but the thought is there. Once open, a monotone of dark grey stares back at you, relieved only by the indicator LEDs and backlit power button.

Perhaps the most intriguing aspect of the interior is the one-piece look of the wrist rest and touchpad. However, we found this very unresponsive on our review sample, and were so frustrated that we immediately plugged in a USB mouse. Fortunately, a second sample we saw didn't have this problem.



Aside from our issues with the touchpad, we found the ergonomics of the machine very pleasing. The keyboard has a nice feel and even though the Enter key is half-height, the typing experience is still a pleasant one. The TFT screen is again absolutely fine – although it isn't one of the largest at 14.1in, and it only has a 1,024 x 768 resolution, it's bright and the viewing angles are perfectly adequate.

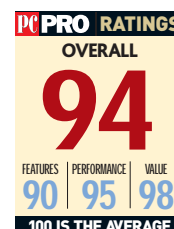
The combination of a 1.6GHz processor and 512MB of RAM achieved a respectable 2D benchmark score of 1.36. This should be enough 2D power for anyone, but the single available SODIMM socket is occupied, preventing memory upgrades. Intel's 855GM graphics

means this isn't a 3D powerhouse either, as reflected in the M3000N's 3DMark2001 SE scores: 1,948 in 16-bit colour, 1,899 in 32-bit.

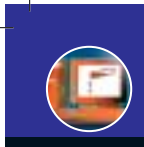
The 40GB Hitachi Travelstar hard disk is joined by a DVD-ROM drive from QSI. It's a shame AJP doesn't include a DVD/CD-RW combo drive as standard, but you can upgrade to a DVD-RW drive for £135. You can also buy a second 40GB hard disk for £149 or a second battery at £99. Not that most people will need this, as the M3000N proved to be a good performer in our rundown tests: a shade under three hours in intensive use, and just over four-and-a-half hours in light use.

There's no software supplied with the AJP besides Windows XP Professional, and the warranty is a rather paltry one-year, return-to-base with a further two years of labour-only cover. While it's true that most hardware failures occur within the first year of ownership, the provision of longer cover is always welcome, especially when combined with accidental damage insurance as ACi, Evesham and Hi-Grade manage.

With mediocre overall performance and no outstanding features other than its looks, the AJP M3000N is left behind in this month's competitive Labs.







# Asus M2400N

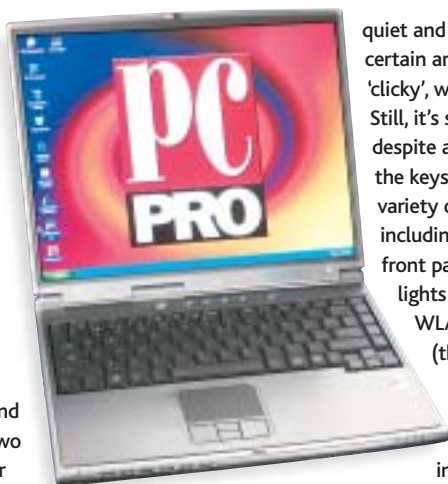
**PRICE** £1,599 (£1,879 inc VAT)

**SUPPLIER** Scan 0870 755 4747

**VERDICT** It may be larger and heavier than some, but the stunning battery life more than makes up for this. It's just a shame about the high price.

The M2400N graphically demonstrates the potential of Centrino technology. Not only did it achieve the best 2D performance (scoring an impressive 1.46), it also managed to outperform every other machine in the Labs on battery life – it lasted an incredible six hours under light use, and an equally impressive two hours, 40 minutes under intensive testing. The only drawback is that it weighs 2.5kg – this sounds quite reasonable, until you realise the Fujitsu Siemens Lifebook weighs just 1.95kg.

The 2.5kg weight is a good reflection of the M2400N's build quality, though, with our only concern being the keyboard. It's generally



quiet and comfortable to use, but certain areas are flimsy and too 'clicky', which can be distracting. Still, it's sensibly laid out – despite a small spacebar – and the keys are well sized. There's a variety of shortcut buttons too, including CD controls on the front panel, plus indicator lights for power, battery, WLAN and unread email (the latter via Asus' useful management software).

The large chassis also enables Asus to incorporate a parallel connector, but this comes at the expense of having only two USB 2 ports, along with a four-pin FireWire connector, infrared and a Type II PC Card slot (Asus supplies a four-in-one card reader, which fills this slot). There's no Bluetooth to complement the WLAN 802.11b, though, and Asus says there's

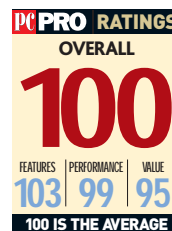
unlikely to be an upgrade path to 802.11a or g.

Expansion options are limited in terms of drives too, with just downgrades from the Toshiba DVD/CD-RW combo drive available. Mind you, it's able to burn CD-Rs at a rapid 24x, so it will meet most people's needs. The same can be said of the 40GB hard disk, while the 512MB of RAM takes up the only accessible SODIMM socket.

Another area of slight disappointment was the 14.1in TFT, which makes it difficult to achieve an even level of contrast due to poor vertical viewing angles. Contrast is reasonably good, though, and the picture is acceptably sharp at the native 1,024 x 768 resolution. Any thoughts you might have about playing intensive games will be wiped out by the integrated graphics, however. This held the M2400N back to 2,010 in 3DMark2001 SE in 16-bit colour.

In spite of our criticisms, the Asus M2400N is still an impressive machine. If battery life is your priority, you'll be hard-pushed to beat it.

With a two-year, collect-and-return warranty, good build quality and Windows XP Professional, it should appeal to business users. If only the price were a little more competitive.



# Evesham Voyager Xs 1.6 Pro

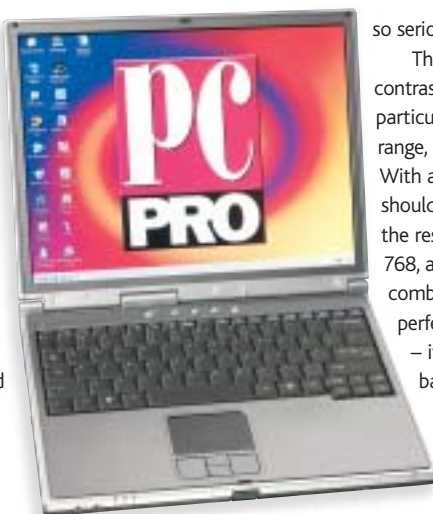
**PRICE** £1,299 (£1,526 inc VAT)

**SUPPLIER** Evesham Technology 0870 728 7070

**VERDICT** Despite solid build quality and good ergonomics, we'd expect more battery life and performance from this otherwise tempting machine.

Uniquely this month, Evesham abandons an internal optical drive in favour of an external DVD-ROM. Even without this, at 1.95kg the Voyager is neither the smallest or lightest machine here. That said, it's solidly built with excellent protection all over, including a DASP (Disk Anti-Shock Protection) pad under the generous 80GB hard disk and a sturdy lid.

Inside, there's a 1.6GHz Pentium-M and a whopping 640MB of RAM, the most of any machine here. Even so, the Evesham was at the bottom end of the performers in 2D this month, scoring 1.31 in our benchmarks. With just the Intel 855GM chipset for 3D tasks, it also scraped to a mere 1,979 in 3DMark2001 SE in 16-bit colour,



so serious gaming is out.

The screen offers good contrast, but viewing angles, particularly in the horizontal range, are disappointing. With a 13.3in diagonal, it should be no surprise that the resolution is 1,024 x 768, and we found the combination to be perfectly pleasant in use – it's helped by even backlighting and good response times.

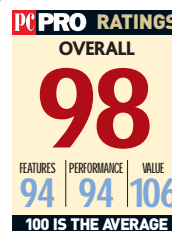
This is particularly useful for DVD movie playback, and the bundled external DVD-ROM is more than capable of supplying these images. It's just a shame that Evesham doesn't offer an upgrade to a DVD/CD-RW combo drive. If you want to watch DVDs on the move, bear in mind that there's only a single, rather quiet speaker

underneath the front bezel – thankfully, the headphone socket is sensibly mounted at the front for easy access.

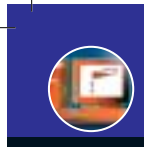
The Voyager only lasted for 110 minutes in our DVD rundown test – not surprising considering the 3,600mAh lithium ion battery. It kept going for 64 minutes in our intensive test and 175 minutes under light use. Compare this with the Fujitsu Siemens Lifebook, which includes an optical drive at the same weight and lasted for 82 minutes and three-and-a-half hours under the same tests.

The keyboard is well thought out, with separated cursor keys. Once you get used to the slightly unresponsive feel of the keys, it's comfortable to use and very quiet. The rest of the chassis is similarly well designed, with three USB 2 ports joining a four-pin FireWire connector and infrared port, as well as a Type II PC Card slot.

So should you buy it? It's temptingly priced, especially considering the inclusion of Windows XP Professional and the accidental insurance cover that accompanies the two-year, return-to-base warranty. But don't overlook the Lifebook if you can afford it, and also consider the 1.65kg IBM ThinkPad X31 (see p63) if power isn't so important.







# Fujitsu Siemens Lifebook S-6120

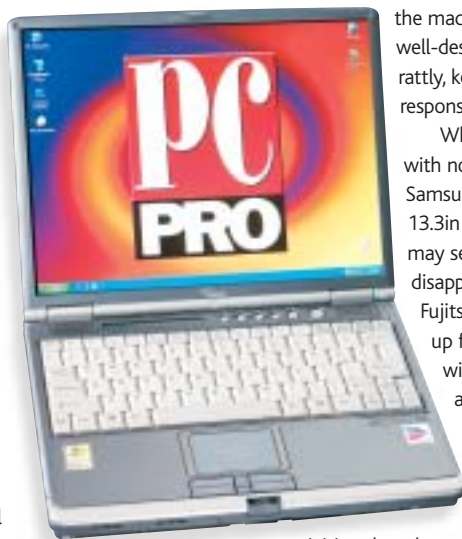
**PRICE** £1,699 (£1,996 inc VAT)

**SUPPLIER** Bechtle Direct 01249 467900

**VERDICT** It's a pleasure to use, with some great ergonomics and portable dimensions, but the price is simply too high.

As one of the smallest and lightest machines on test, the Lifebook is a prime example of Centrino's benefits. Compared with the Toshiba Satellite Pro M10, it looks positively dwarf-like. The small chassis size means you lose out on legacy ports (unless you opt for the £45 port replicator), but it's a neat package. Fujitsu Siemens' engineers deserve particular praise for squeezing in a DVD/CD-RW combo drive in a unit of a similar size to the Evesham – this is the same weight, has an almost identical footprint and is just 5mm thinner.

The Lifebook is well designed too, with a pleasing gunmetal finish and a reassuring level of build quality throughout. Fujitsu Siemens has paid particular attention to the ergonomics of



the machine with a well-designed, if slightly rattly, keyboard and a responsive trackpad.

When compared with notebooks like the Samsung X10, the 13.3in XGA screen may seem a little disappointing, but

Fujitsu Siemens makes up for its smaller size with a vivid, crisp and well-lit panel with decent viewing angles. It doesn't lend itself to leisure

activities, though: poor response times mean DVD playback is a little ghosted, if watchable, and there's no S-Video out either. What's more, the integrated graphics chip doesn't offer enough oomph for after-hours

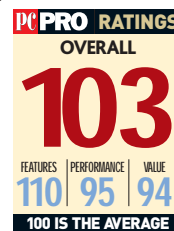
games, managing a score of just 1,897 in 3DMark2001 SE at 16-bit.

Despite the 256MB of RAM and the 1.6GHz Pentium-M processor, the Lifebook failed to impress in 2D performance too. It was some distance behind the top-of-the-table Asus with its 1.46, but let's be realistic – a score of 1.34 means the Lifebook will cope with most things you throw at it.

A far more important factor for most people on the move is battery life, and – given the unit's 1.95kg weight – the Lifebook's battery life is impressive. It lasted for 82 minutes under intensive use and stretched to three-and-a-half hours in our light-use tests. However, the Samsung X10 managed to eke out an extra 54 minutes under light use, all for just 50g more – and it comes with a lightweight battery capable of another two hours.

The Lifebook S-6120 benefits from a superior three-year, international collect-and-return warranty, while added security features – such as PIN protection and smart card security (via the Type II PC Card slot) – lift it

above the more leisure-orientated X10. However, the Lifebook's £1,699 price is hard to swallow, making it impossible to give this otherwise deserving machine a Recommended award.



# Hi-Grade Notino C1000

**PRICE** £1,699 (£1,996 inc VAT)

**SUPPLIER** Hi-Grade 020 8532 6111

**VERDICT** A slim notebook with plenty of 2D power and decent battery life in return for its 2.45kg weight. But it's still too expensive for what you get.

Hi-Grade and Samsung share the honour of being the thinnest laptops this month. Despite being just 28mm thick, there's still room for a DVD/CD-RW capable of writing CD-Rs at 16x. This isn't the quickest – the other combo drives apart from the Sony's and Samsung's are capable of 24x – but it's fast enough. We were also pleased to see a 60GB hard disk.

The 1.6GHz Pentium-M chip matched with 512MB of RAM propelled the Hi-Grade to a score of 1.37 in our 2D benchmarks. However, its reliance on Intel's 855GM chipset severely limited it in 3DMark2001 SE. It only managed 1,905 in 16-bit colour, which isn't enough for modern 3D gaming.

We were also disappointed by the sound



quality of the speakers, which did little to enhance the DVD movie experience. This is a shame, as the screen is more than capable of keeping up with fast action. It also has good contrast, but mediocre viewing angles and a slight lack of brightness let it

down. The keyboard can't match the best either, as the top of the keys are level with the

surrounding plastic rather than being raised, which feels slightly awkward.

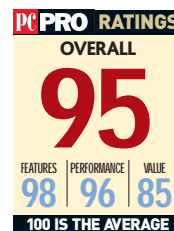
In terms of build quality, we were a little concerned that the front bezel had started to come away from the screen, and the lid has slightly too much flexibility for our liking.

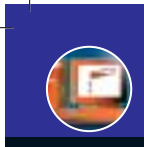
Otherwise, the C1000 feels very solid – a fact reflected in its 2.45kg weight. This is still a highly portable notebook, though, and its 3,600mAh battery powered the C1000 for 88 minutes in our intensive test and nearly four hours under light use.

Unlike several of its competitors this month, Hi-Grade doesn't offer Bluetooth connectivity to complement the 802.11b WLAN. On the other hand, there is an upgrade path to both 802.11a and 802.11g wireless standards. Three USB 2 ports are fitted, as is a four-pin FireWire port, but there are no legacy ports other than infrared. A port replicator is available for £85 to remedy this situation.

Hi-Grade opts for Microsoft Windows XP Home as the OS – not ideal in a laptop designed specifically for network connection. Hi-Grade impresses with its warranty, though – not only does it include two years' international collect-and-return cover, but accidental damage is also covered during this period. If you drop the machine and damage the screen, it will be either repaired or replaced under warranty.

But this alone isn't enough to justify the C1000's high price. Although well specified, this notebook fails to excel in any area.





# Multivision Nexus CT

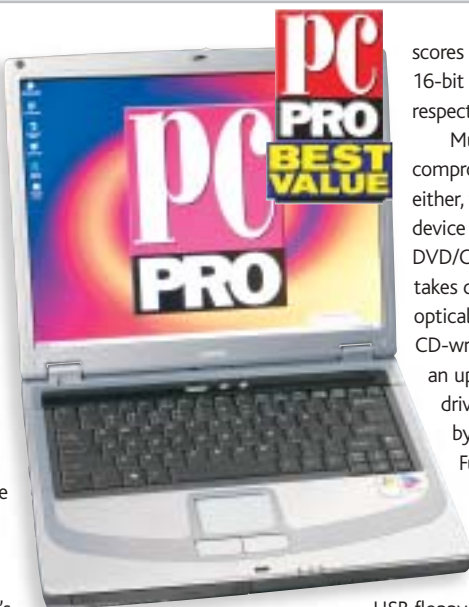
**PRICE** £1,199 (£1,409 inc VAT)

**SUPPLIER** Multivision 0870 220 2822

**VERDICT** A stunning price earns Multivision the Best Value award, especially as it makes virtually no compromises on specification.

It's the price that sets the Nexus apart from the rest in this month's Labs. At £1,199, the second lowest price here, it certainly punches above its weight. There's a 1.6GHz chip inside along with 512MB of RAM – both pretty amazing inclusions given the price. Together, they powered the Nexus to the second-highest score in our 2D benchmarks.

Not content with this, Multivision also manages to squeeze ATI's Mobility Radeon 9000 chip into the specification. This gives the Nexus enough graphics muscle to play most games – 3DMark2001 SE returned



scores of 8,009 and 7,380 in 16-bit and 32-bit colour respectively.

Multivision doesn't compromise on the hard disk either, with a 60GB Fujitsu device in place. A fast DVD/CD-RW combo drive takes care of removable optical storage with a CD-writing speed of 24x, and an upgrade to a DVD-RW drive should be available by the time you read this.

Further removable storage is provided by an SD card slot sitting below the Type II PC Card slot, while a

USB floppy disk option is available

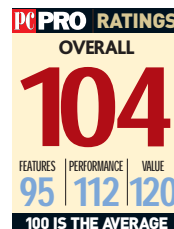
for a reasonable £29. There's also a port replicator on offer for £49, but with three USB 2 ports, plus Bluetooth and FireWire, this

notebook isn't exactly lacking in connectivity.

At 2.9kg, the Nexus weighs over a kilogram more than the lightest notebook this month. It's also a little bit on the chunky side compared with most of the others, and these two facts make it less suited to life on the shoulder than the Samsung or Fujitsu Siemens. Battery life wasn't too bad, though, with more than one hour, 40 minutes in the intensive test and close to five hours under light use.

In terms of ergonomics, the Nexus is identical to the ACi Centurion, as they share the same chassis, screen and keyboard. One of the reasons why Multivision can drop the price by £300 is its choice of Windows XP Home over XP Professional – not ideal if you want to network this notebook. Multivision can't match ACi's impressive warranty either, but the single year of collect-and-return cover followed by two years of labour-only, return-to-base cover is by no means the worst on offer this month.

Multivision also finds room in its budget to include Lotus SmartSuite Millennium Edition, which is a fine choice for this notebook's intended home user. The Nexus can't match the likes of Fujitsu Siemens and Samsung for mobility, or overall build quality, but at this price such criticisms seem picky.



# Rock Pegasus CT

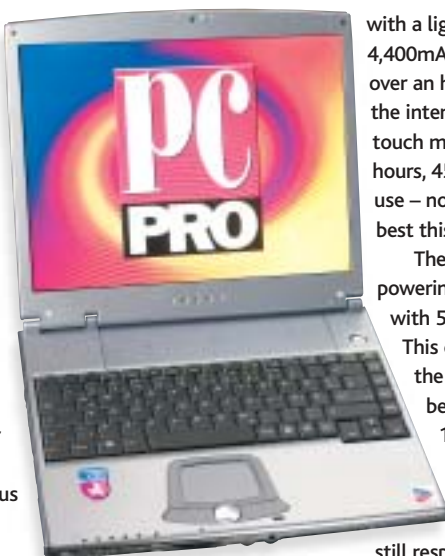
**PRICE** £1,149 (£1,350 inc VAT)

**SUPPLIER** Rock 0870 990 9090

**VERDICT** A machine that fails to shine in any area. With several ergonomic 'issues', the Rock falls behind in this month's Labs.

The first thing we noticed on booting up the Pegasus was the volume of the internal speakers. The boot-up 'beep' is incredibly loud and annoyed us after only a few power cycles. It's not for the shy type if you'll be using your notebook on the train. When pushed, the Pegasus was also quite noisy in operation as the cooling fan cut in frequently, while the wrist rest and touchpad both got uncomfortably warm after about half an hour.

In order to keep the Pegasus CT as slim as possible, the battery is the full thickness of the notebook and takes up most of the area behind the keyboard. The locks aren't sprung, though, and if you forget to fasten them the battery can be pushed out



with a light touch. The 4,400mAh unit lasted just over an hour and a half in the intensive test and a touch more than three hours, 45 minutes in light use – no match for the best this month.

There's a 1.5GHz chip powering the machine with 512MB of memory.

This combination gave the Rock a 2D benchmark score of 1.30 – among the lowest of the machines on test, but it's still respectable. Since

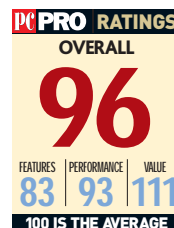
it relies on Intel's integrated graphics, its 3D performance is much more disappointing; this fact was reflected in our 3DMark2001 SE tests, where the Rock managed only 1,913

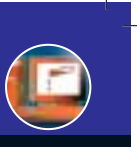
and 1,817 in 16-bit and 32-bit respectively.

As with so many of the machines here, Rock opts for a 40GB hard disk coupled with a DVD/CR-RW combo drive. It's a good, solid combination, and for £149 Rock can even supply a second 40GB hard disk that fits in the bay. Uniquely this month, the Pegasus includes a built-in, four-in-one card reader. This can access Memory Stick, SmartMedia, SD and MMC cards, which covers a good proportion of digital cameras and PDAs.

Another plus is the screen. Providing you look at it straight on, the image is bright and sharp, and despite supporting only a 1,024 x 768 resolution it's pleasant to work on – only disappointing viewing angles let it down. We can't be so positive about the keyboard. It's rattly and flexed considerably. At least the touchpad was accurate, but it doesn't have the feel of the Samsung, Sony or Hi-Grade.

It's the quality of the other notebooks compared with the Pegasus that lets it down. When you can buy the Multivision Nexus CT for £50 more, there's no reason to compromise on ergonomics, build quality and battery life. Even the excellent three-year, collect-and-return warranty does little to redress the balance.





# IBM ThinkPad T40p TC1G1UK

PRICE £2,929 (£3,442 inc VAT)

SUPPLIER [www.dabs.com/2H3DWS](http://www.dabs.com/2H3DWS)

**VERDICT** Stunning build quality and ergonomics are matched by superb performance in all areas. As usual for the ThinkPad T series, though, you pay a high price.

Puncturing the Centrino bubble just a little is this excellent notebook from IBM. Although there's a 1.6GHz Pentium-M processor inside and it uses Intel's 855PM chipset, IBM leaves the Intel fold when it comes to wireless by opting for a Philips-made dual-band Wi-Fi chip. Not only does this support 802.11b, but also 802.11a. Centrino-branded notebooks won't support this faster standard until next year. Add infrared and Bluetooth, and the T40p is extremely well set up when it comes to wireless features.

As usual, IBM leads the way when it comes to ergonomics. The 14.1in screen's quality beats all the Centrino notebooks this month, with unmatched viewing angles and bright, even backlighting, while the keyboard feels superb. The key placement is also beyond rebuke, apart from the missing Windows key. Advocates of touchpads and trackpoints should be

equally delighted, with both on show here.

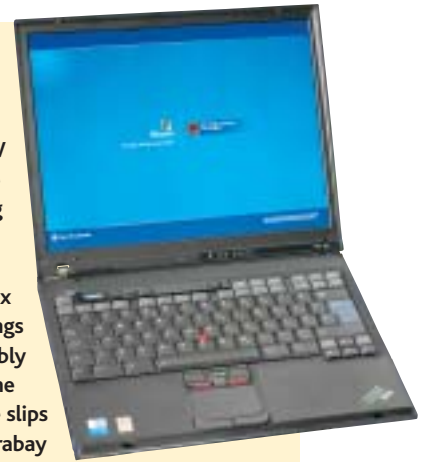
Even though it's just 27mm thick, this isn't the most portable of notebooks, with a rather large footprint of 311 x 282mm (W x D). It would have been just 254mm deep if IBM hadn't decided to include such a large-capacity battery, which protrudes out at the back. Mind you, it still weighs only 2.4kg and the payback is stunning battery life – more than seven hours under light use. We've never been closer to all-day computing on the move.

It was similarly impressive in our speed tests, scoring 1.46 in our 2D benchmarks, while the ATI Mobility Fire GL 9000 graphics returned a score of 7,198 in 3DMark2001 SE (XGA, 32-bit colour). This version of the ATI chip is for digital content creators, but you can buy the TC192UK with Mobility Radeon 9000 graphics and an 80GB hard disk for £2,879. The TC1G1UK model includes only a 40GB hard disk.

Both versions include a DVD/CD-RW combo drive for archiving and backup duties, and with 16x/10x CD-RW ratings it's respectably quick too. The optical drive slips into the Ultrabay Slim, which allows you to add a second battery. Another obvious purchase is the Port Replicator II, to complement the two USB 2 ports, one parallel port, S-Video out and VGA connector. The port replicator also duplicates the dual 10/100 and Gigabit Ethernet port included on the T40p.

Whichever version of the T40p you choose, it's unlikely to offer fantastic value for money, especially considering the return-to-base nature of the three-year warranty. Nevertheless, if your business wants the best quality notebook around, and the longest battery life, the ThinkPad T40p is an obvious choice.

TIM DANTON



# Samsung X10 XTC 1600

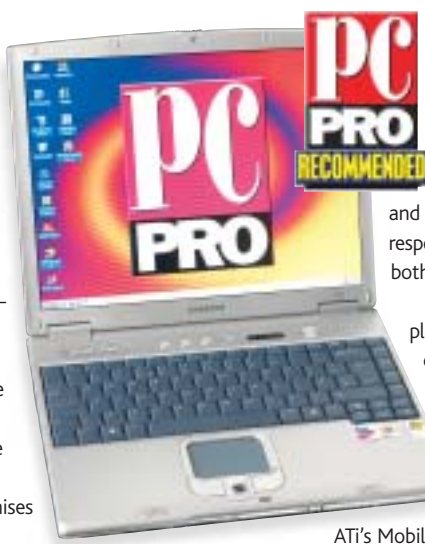
PRICE £1,735 (£2,039 inc VAT)

SUPPLIER [www.dabs.com/2DDVWS](http://www.dabs.com/2DDVWS)

**VERDICT** An amazingly portable notebook that packs in plenty of power, great ergonomics and all the features most people need. Mind you, this quality comes at a price.

Anyone who has spent the last few years carrying round a brick-like notebook will immediately fall in love with the Samsung X10. Not only is it slim – at just 28mm, it's the joint thinnest here. It's not even because of the low weight – with the small battery in place, the X10 weighs just 1.8kg (rising to 2kg with the extra-life battery, which Samsung bundles). It's more the fact that Samsung has made virtually no compromises in the X10's design.

The chief sign of the X10's brilliance came in our subjective ratings, where we examined the build quality and design of the notebook. The X10 came top or runner-up in all five areas, from build quality to style – an amazing feat. We



particularly liked the screen. Its resolution of 1,024 x 768 is perfectly good for a screen diagonal of 14.1in, and what's more it's bright and has good enough response times to cope with both DVDs and games.

And if you're hoping to play games, the X10 should cope for now – it scored 5,158 in 3DMark2001 SE (16-bit), thanks to the GeForce4 440 Go graphics. Still, notebooks using

ATI's Mobility Radeon 9000 scored higher still. We've no complaints when it comes to 2D speed. As with most notebooks we've seen based on the 1.6GHz Pentium-M, the X10 scorched through our benchmarks, no doubt helped by 512MB of DDR memory.

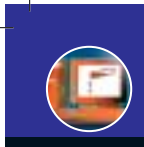
Our final tests were for battery life, and initially the X10 was disappointing. With the smaller battery in place, it lasted for just 40 minutes under intensive use – compare that with 164 minutes from the Asus. Fortunately, the extra-life battery kept the X10 going for 90 minutes. And besides, the smaller battery was enough for more than two hours under light use, extending to almost four-and-a-half hours with the extra-life battery. Add them together, and you've got well over six hours of life.

The X10 includes a DVD/CD-RW combo drive to complement the 60GB hard disk – together, these should meet most people's requirements, even if other optical drives here provide faster CD-RW speeds than 8x/8x. There are also ports for FireWire, Memory Stick and two USB 2 devices, while an Optical S/PDIF out could also prove useful. The only omissions are infrared and Bluetooth.

It adds up to an excellent notebook, but, judging by the price, Samsung knows it. At £1,735, it's a phenomenal £376 more expensive than the better-specified Acer TravelMate 803LCi. But this is the price you pay for greater portability – and at 2.75kg there's no way the 803LCi can match the 1.8kg X10's ultra-portable claims.

PC PRO RATINGS		
OVERALL		
104		
FEATURES	PERFORMANCE	VALUE
111	102	94
100 IS THE AVERAGE		





**THE LABS**  
Centrino notebooks

# Sony VAIO PCG-Z1SP

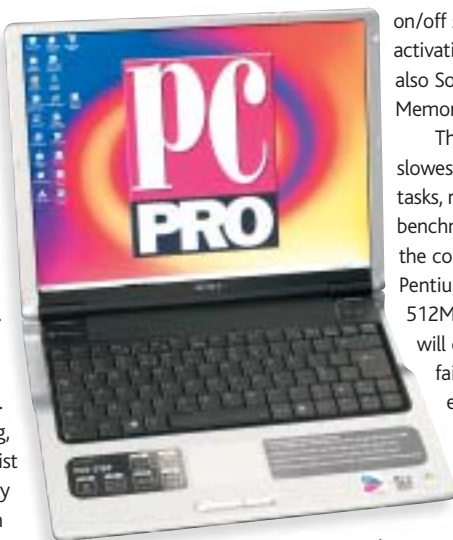
PRICE £1,599 (£1,879 inc VAT)

SUPPLIER [www.dabs.com/2FKQWS](http://www.dabs.com/2FKQWS)

**VERDICT** A stylish take on Centrino technology, the VAIO delivers impressive battery life and a great screen, but at the cost of expandability.

With standardised components forming the basis of the Centrino brand, choosing between these notebooks becomes tricky. Sony helps out by producing a design that you'll either love or hate, with its curvy silver casing and unusual chassis design. Compared with some of the more generic models here, it's quite a statement.

Looks aren't everything, of course, and the minimalist design means there are only two USB 2 ports, a four-pin FireWire port and one Type II PC Card slot for expansion purposes. As with the Samsung, there's no infrared port either, but the VAIO complements the 802.11b wireless with Bluetooth – a handy wireless



on/off switch makes activating them easy. There's also Sony's customary Memory Stick slot.

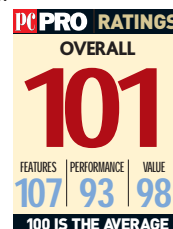
The VAIO was the slowest machine here at 2D tasks, reaching 1.26 in our benchmarks – nevertheless, the combination of a 1.5GHz Pentium-M processor and 512MB of RAM means it will cope with most things fairly quickly. The main exception is 3D games – the Mobility Radeon graphics were only enough for 1,696 in 3DMark2001 SE (XGA, 32-bit colour).

Otherwise, the PCG-Z1SP is enjoyable to use. The keyboard is curiously designed, with single-width Shift keys and quite a shallow key depth, but is actually pleasing (not to mention

quiet) to the touch. The beautifully sharp 14.1in screen is brightly lit too and, with a resolution of 1,400 x 1,050, it offers plenty of Desktop space. If you find the icons and system text too small, you can always increase the dpi to 120 in Display settings. Add the clear stereo speakers, good viewing angles and a respectable response time, and it's also well suited to DVD playback via the integrated combo drive.

With a sealed chassis meaning that all upgrades need to be performed by Sony, the CD-RW part of the combo drive is the easiest way to archive data from the 60GB hard disk, and it offers a respectable 16x speed for burning CD-Rs. The lack of a removable drive also means there's no way to add a second battery, but there's some impressive performance as is – it lasted 246 and 155 minutes in light- and intensive-use tests respectively.

Add battery life to superb build quality, a well-protected screen and a 2.15kg weight, and this notebook is nicely equipped for life on the move. Sony hopes that business users will be convinced, but note the lack of advanced security features and the one-year, return-to-base warranty as standard. This is one area where the similarly lightweight Fujitsu Siemens Lifebook wins hands-down.



# Toshiba Satellite Pro M10

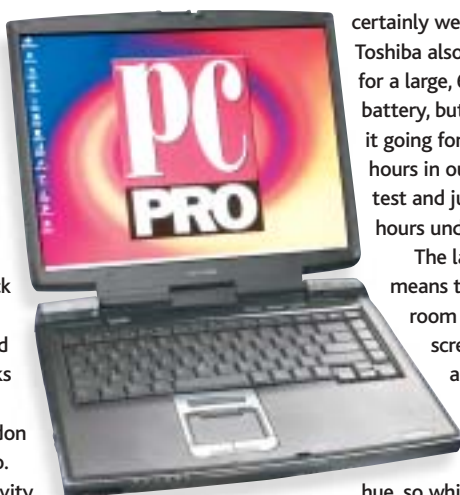
PRICE £1,575 (£1,851 inc VAT)

SUPPLIER [www.dabs.com/2FVDWS](http://www.dabs.com/2FVDWS)

**VERDICT** The most flexible notebook on test, with lots of connectivity plus a 15in screen, but in return it's both expensive and heavy.

Even though the Satellite Pro M10 is up to date in terms of specification, it seems that Toshiba hasn't quite embraced the portability aspect of Centrino technology. While other machines slim down to 2kg or lower, the M10 weighs a comparatively leaden 3.2kg. It even looks dated – its shiny black exterior is quickly ruined by smudgy fingerprints. Once the lid is open, though, the Toshiba looks much better with its familiar, shoulder-mounted Harman/Kardon speakers – these sound good too.

There's also lots of connectivity in return for the weight. While others make do with a sprinkling of USB 2 and FireWire ports, Toshiba also finds space for a parallel and infrared port, a SD slot plus two Type II PC Card slots. With Bluetooth and 802.11b installed, the Satellite Pro M10 is



certainly well connected. Toshiba also finds space for a large, 6,600mAh battery, but this only kept it going for about two hours in our intensive test and just over four hours under light use.

The large chassis means there's also room for a 15in screen, but there are signs of compromise – the screen has a slight

hue, so whites don't look entirely white, and it also suffers from banding. But these aren't fatal problems, and good viewing angles coupled with a massive native resolution of 1,600 x 1,200 make it comfortable to use. The rest of the ergonomics are also well thought out. The keyboard is

reasonable, with separated cursor and page navigation keys, while Toshiba's practice of including both touchpads and trackpoints is always a positive. The edges of the touchpad act as scroll bars, which is another nice touch.

Powering the Toshiba to a respectable 1.35 in the 2D benchmarks is the 1.6GHz version of the Pentium-M. It's matched with the almost ubiquitous 512MB of RAM, with room to add another stick if required. Meanwhile, Nvidia's GeForce4 420 Go helped the Satellite Pro to a respectable 4,161 score in 3DMark2001 SE (XGA, 32-bit colour).

Another sign of this machine's heavyweight intentions is the 5,400rpm, 60GB hard disk. This should be plenty, but if you ever need to archive data the well-specified DVD/CD-RW combo drive writes CD-Rs at 24x. For £299, it can even be upgraded to a DVD-RAM drive, which also writes to DVD-R and -RW discs.

Nevertheless, the disappointing one-year, return-to-base warranty and high price count against the Toshiba, especially when compared with the Acer TravelMate 803LCi.

This makes the Satellite Pro difficult to recommend outright, but its flexibility and specification mean it shouldn't be ignored.

