

THE LABS
Value notebooks

Value notebooks

The definitive group test for big-value notebooks, with a lucky 13 on test



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Jim Martin, Alyn Sparkes
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Big name or big value? Desktop or mobile processor? Features or performance? Choosing a notebook isn't as easy as it used to be, but fear not as we put 13 varied systems through our demanding tests to separate the men from the boys.

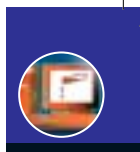
This month's line-up reads like a who's who of notebook manufacturing. IBM, Sony and Toshiba represent the biggest names, but there's a host of international companies trying to muscle in on their territory, including Fujitsu Siemens and Samsung. Meanwhile, we see several British companies produce power- and feature-packed notebooks attempting to lure you away from big-name brands.

It's interesting that a British company, Hi-Grade, offers the best warranty. Not content with two years' international collect-and-return cover, it also provides accidental damage insurance, so, if you drop your notebook and the screen smashes, Hi-Grade will either replace or repair it. Then again,

no-one can match IBM for its sustained performance in our reliability and service awards, with the company winning the Notebook Service award for the last four years in a row.

IBM's ThinkPad this month isn't exactly weighed down with features or power, but do you need any more than a 1.2GHz Celeron and a CD-ROM drive? If you want a notebook to browse the Internet and dash off a letter or two, it's a fine choice. At the other end of the spectrum, we've got notebooks with cutting-edge graphics processors, 2.53GHz processors and even a DVD burner.

The most important thing is to buy for the future – it's far more difficult to upgrade



the hard disk in a notebook than it is in a desktop, and you're stuck with the same processor and graphics package throughout the life of your machine.

You should also make an educated decision on whether to buy a desktop or mobile processor. We've covered this many times before in *PC Pro* and, rather than repeat ourselves, there's a special article on our website (www.pcpro.co.uk). Just click through to the Labs section, select Value notebooks and you'll find an article called 'Desktop or mobile chip'.

RATING FEATURES

As with buying a desktop PC, speed shouldn't be your first consideration when choosing a notebook. You'll spend 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 for the extra space it gives you on the Desktop.

We also give each TFT a rating for quality, which incorporates the evenness of its backlighting, its viewing angles and its contrast. We were more impressed than ever before by the selection of TFTs, with only one here proving a disappointment. 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 is 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, see p58.



IBM's ThinkPad offers the best keyboard in terms of both layout and feel.



Hi-Grade takes the Labs Winner award this month – see p66 to find out why.

Hardware and software

Eight of the 13 notebooks here include a combo DVD/CD-RW drive, and we award points for speed of writing and re-writing. Hi-Grade goes one step further, thanks to its inclusion of a DVD-RW drive – this can burn to DVD-R, DVD-RW, CD-R and CD-RW discs. It's an amazing inclusion in a notebook that costs only £999.

As you'd expect, the larger the hard disk the more points a machine receives. Likewise, extras like WLAN count towards each machine's hardware score, as do the variety and number of ports. For instance, USB 2 and FireWire both score added points.

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

Build quality and style

We give each notebook 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 it gets a smaller weighting in the overall features score.

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 have to carry it around the office and on those occasions when travelling.

The other side of the coin is expandability; sometimes the extra weight results in a second bay for adding another hard disk, optical drive or even a battery. We take the number of options into account and any other expansion

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.

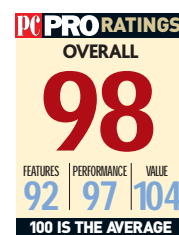
One PC, printer or motherboard doesn't necessarily suit all. We also give a Recommended award – sometimes two – to a PC or peripheral that might be better suited to differing needs. In certain Labs, we also give a self-explanatory Best Value award.



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 notebook 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, to give an overall score that is again relative to the average.



opportunities such as adding more memory.

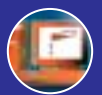
Warranty

The amount of points each machine receives for the warranty depends on the length of the cover and the type. A collect-and-return warranty has obvious advantages over return-to-base; with return-to-base cover, you must pay for sending the machine back to the vendor. International cover gains added points, as does the inclusion of accidental damage cover.

Finally, we give bonus points to each of those manufacturers that performed well in our Notebook Reliability and Service & Support awards (see *PC Pro Awards 2002*, issue 97, p174).

Battery life and speed

See over the page for details of how we put the notebooks through their performance paces and tested for battery life.



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, so if a notebook scores 1.05 that means it was 5 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. We use two settings: at 1,024 x 768 resolution in 32-bit colour, with 32-bit textures and triple buffering; and at the same resolution, but dropping the colour and textures to 16-bit, and with double buffering. We run each test ten times for maximum accuracy.

BATTERY TESTS

We use three battery tests. The first is our intensive test, where we push 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 absolute minimum time a notebook will last.

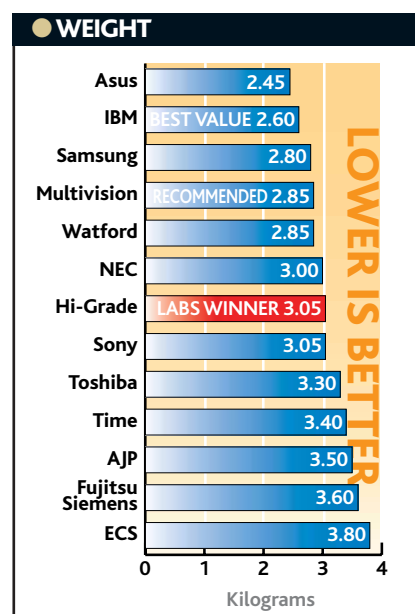
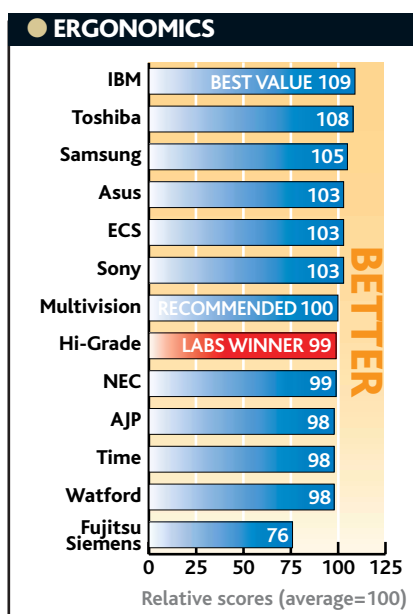
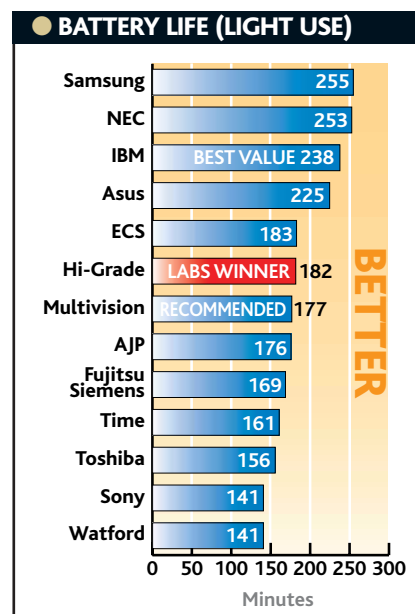
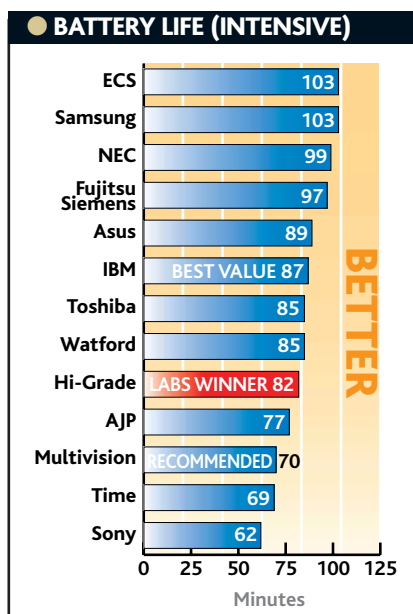
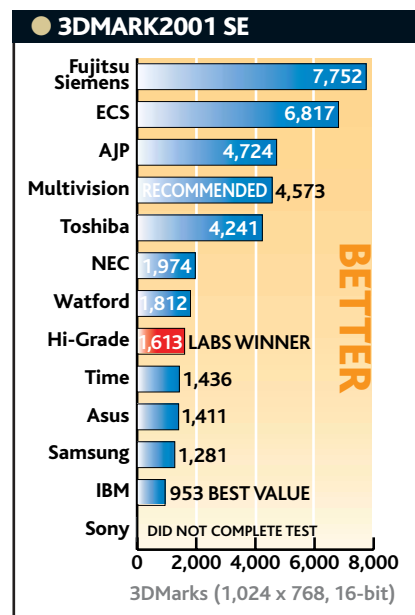
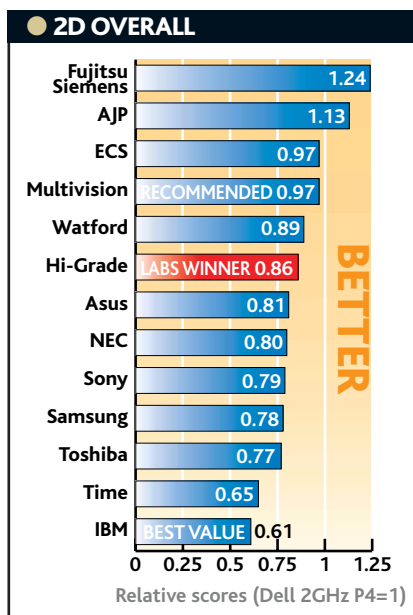
To see the maximum time a notebook will last, we set the brightness to low and run a timer in the background; this writes to the hard disk every minute. We also make each notebook repeatedly play back a 30-minute DVD Video until the battery drops to 15 per cent (some DVD software refuses to play at this level).

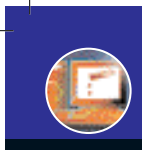
ERGONOMICS

This score takes into account the size and quality of the screen, and the usability of the keyboard and 'mouse'. See p57 for more details.

WEIGHT

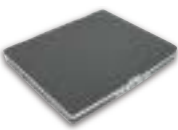
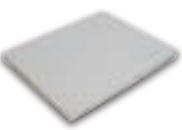
If you go to a manufacturer's website, you may find their quoted weight is different to ours - this is often due to the notebook being weighed without the optical drive or battery. All Labs-tested notebooks are weighed on the same industrial-quality scales, with their standard drives and batteries in place.





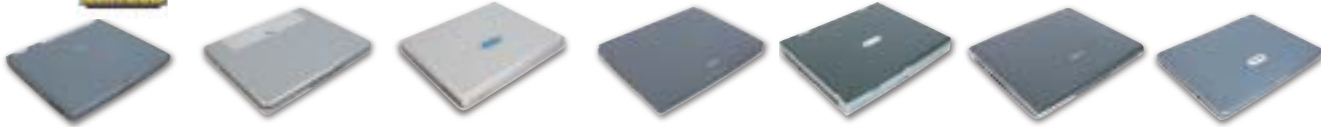
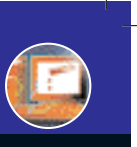
THE LABS Value notebooks

● FEATURE TABLE



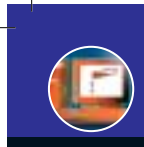
	AJP 8640	Asus M2417E-DVD	ECS Green 732	Fujitsu-Siemens Amilo D 7820	Hi-Grade Notino 4400-1800	IBM ThinkPad R31
OVERALL RATING	100	103	97	100	107	105
Manufacturer's code	Not applicable	Not applicable	Not applicable	7820 2.53 Combo	Not applicable	TR1MLUK
Price* (inc VAT)	£999 (£1,174)	£950 (£1,116)	£979 (£1,150)	£999 (£1,174)	£999 (£1,174)	£639 (£751)
Cost of delivery* (inc VAT)	£29 (£34)	£9.60 (£11.28)	£10 (£12)	£25.50 (£30)	£29 (£34)	£6 (£7)
Supplier	AJP Computers 020 8208 9747	Viper Systems 01905 420467	Centerprise 01256 378000	Nice PC 0870 606 6677	Hi-Grade 020 8532 6113	dabs.com 0800 138 5182
Supplier's website	www.ajp.co.uk	www.vipersystems.co.uk	www.centerprise.co.uk	www.buyalifebook.co.uk	www.higrade.com	www.dabs.com
Manufacturer's website	www.ajp.co.uk	www.asus.com	www.ecs.uk.com	www.fujitsu-siemens.co.uk	www.higrade.com	www.ibm.co.uk
Basic warranty**	2yrs RTB (2nd year labour-only)	2yrs RTB	1yr RTB	1yr C&R	2yrs C&R international***	1yr RTB
Width x depth (mm)	332 x 283	305 x 252	332 x 281	326 x 270	325 x 269	313 x 254
Height including feet (mm)	40-47	32-41	41-48	44-48	42-43	38-39
System weight with battery (kg)	3.50	2.45	3.80	3.60	3.05	2.60
CORE COMPONENTS						
Processor type	2.4GHz Intel Pentium 4	1.7GHz Intel Pentium 4-M	2GHz Intel Pentium 4	2.53GHz Intel Pentium 4	1.8GHz Intel Pentium 4-M	1.2GHz Intel Mobile Celeron
Mobile/desktop chip	Desktop	Mobile	Desktop	Desktop	Mobile	Mobile
Level 2 cache size	512KB	512KB	512KB	512KB	512KB	256KB
Motherboard chipset	SiS645 + SiS962	SiS650 + SiS961	SiS645DX	SiS645DX	SiS M650	Intel 830
RAM fitted	512MB PC2700	256MB PC2700	256MB PC2100	256MB PC2100	256MB PC2100	128MB PC133
Maximum RAM in current configuration	512MB	256MB	768MB	768MB	768MB	640MB
SODIMM sockets free/total	0/2	0/1	1/2	1/2	1/2	1/2
DISPLAY						
Display size (in)	14.1	14.1	15	15	14.1	14.1
Native resolution	1,024 x 768	1,024 x 768	1,400 x 1,050	1,024 x 768	1,024 x 768	1,024 x 768
Graphics chipset	Nvidia GeForce4 420 Go	SiS650	ATI Mobility Radeon 9000	ATI Mobility Radeon 9000	SiS650	Intel 82830M
Video memory	32MB	16MB shared****	64MB	64MB	32MB shared****	Dynamically assigned
Extended Desktop*****	✓	✓	✓	✓	✓	✓
Other output	S-Video	X	S-Video	S-Video	S-Video	S-Video
DRIVES						
Hard disk (make and model)	Hitachi DK23DA-40	IBM Travelstar 40GN	IBM Travelstar 40GN	Fujitsu MHR2020AT	Hitachi DK23EB-40	IBM Travelstar 40GN
Speed (rpm)	4,200	4,200	4,200	4,200	5,400	4,200
Removable by user	✓	✓	✓	✓	X	✓
Nominal capacity	40GB	20GB	20GB	20GB	40GB	20GB
Formatted capacity	37.2GB	18.6GB	18.6GB	13.7GB	37.2GB	17.5GB
Floppy disk drive	✓ (external)	X	X	✓ (integrated)	✓ (integrated)	X
Optical drive and speeds	DVD/CD-RW: Panasonic UDJA720 (8x DVD, 8x/8x/24x CD-RW)	DVD: Toshiba SD-C2502 (8x/24x)	DVD/CD-RW: QSI SBW-161 (8x DVD, 8x/8x/24x CD-RW)	DVD/CD-RW: QSI SBW-161 (8x DVD, 8x/8x/24x CD-RW)	DVD-RW: Toshiba SD-R6012 (1x DVD-R/RW, 8x DVD, 16x/10x/24x CD-RW)	CD: TEAC CD-224E (24x)
Drive bay options	DVD-ROM, CD-RW, CD-ROM	X	X	X	DVD-ROM, CD-RW, CD-ROM	DVD-ROM, CD-RW, combo DVD/CD-RW, hard disk, floppy drive, Zip 250
BATTERY						
Battery technology	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion
Capacity of battery (mAh)	6,000	4,000	5,880	5,880	4,000	4,000
Price of replacement battery* (inc VAT)	£99 (£116)	£75 (£88)	£43 (£50)	£56 (£68)	£95 (£112)	£100 (£118)
COMMUNICATIONS						
Modem (standard)	HSP56 MR-M8640 (V.90)	Lucent Soft Modem AMR (V.90)	HSP56 (V.90)	Lucent Soft Modem AMR (V.90)	Lucent Soft Modem AMR (V.90)	Lucent Soft Modem AMR (V.90)
Network (speed)	SiS900 (10/100)	SiS900 (10/100)	SiS900 (10/100)	SiS900 (10/100)	Realtek RTL8139 (10/100)	Intel PRO/100 VE (10/100)
Integrated aerial	✓	✓	Optional	X	X	X
Wireless technologies	Intersil Prism WLAN	Intel WLAN	X	X	X	X
PORTS						
VGA	✓	✓	✓	✓	✓	✓
PC Card slots	1 Type II	1 Type II	1 Type II	2 Type II	1 Type II	2 Type II
USB	4 USB 2	2 USB 1.1	4 USB 2	2 USB 2	2 USB 2	2 USB 1.1
FireWire (IEEE-1394)	1 (four-pin)	1 (four-pin)	1 (four-pin)	1 (four-pin)	1 (four-pin)	X
Infrared	✓	✓	✓	X	✓	X
Serial	X	X	X	✓	✓	X
Parallel	✓	✓	✓	✓	✓	✓
PS/2	✓	X	X	✓	X	X
S/PDIF	✓	✓	✓	✓ (Optical)	X	X
Other ports	SD/MMC, Memory Stick, SmartMedia	X	X	X	X	X
Pointing device type	Trackpad	Trackpad	Trackpad	Trackpad	Trackpad	Trackpoint
Docking station options (price* exc VAT)	X	Port Bar II (£69)	X	X	X	Port replicator (£79)
OTHER PERIPHERALS						
Sound chipset	Avance AC97	SiS7012	Avance AC97	SiS7012	Avance AC97	SoundMAX Digital Audio
Speakers location	Chin	Chassis sides	Above keyboard	Above keyboard	Chin	Chin
Internal microphone	✓	✓	✓	X	✓	X
Carry case supplied	✓	✓	X	X	✓	X
Additional peripherals	X	USB mouse	X	S-Video cable	X	X
SOFTWARE SUPPLIED						
Operating system	Windows XP Home SP 1	Windows XP Professional SP 1	Windows XP Home	Windows XP Home SP 1	Windows XP Home	Windows XP Home
Recovery/Windows CD provided	Recovery CD	Recovery CD	Recovery CD	Recovery CD	Recovery CD	Recovery CD
Main titles	X	X	X	Microsoft Works Suite 2003	Microsoft Works 6	X

*Prices correct at time of going to press. **Warranty is parts and labour, UK mainland only, unless otherwise stated. ***Includes accidental damage. ****Changeable in BIOS



Multivision Visage	NEC Versa M300	Samsung V20 XTC 1800	Sony VAIO PCG-FX801	Time Traveller P4-Cel 1700	Toshiba Satellite Pro 2100	Watford Precision 550
104	102	100	100	87	103	96
MV0030	Not applicable	NV20N 00C4/SUK	Not applicable	Not applicable	PS210E-006P9-EN	Not applicable
£799 (£939)	£999 (£1,174)	£850 (£999)	£709 (£833)	£784 (£921)	£974 (£1,144)	£999 (£1,174)
£39 (£46)	£45 (£53)	£19 (£22)	£13.45 (£15.80)	£35 (£41)	£6 (£7)	£25 (£29)
Multivision	NEC Computers UK	Micro Anvika	Simply	Time Computers	dabs.com	Watford Electronics
0870 066 0880	0870 010 6322	020 7467 6050	0870 729 7365	01282 777555	0800 138 5182	0870 220 0700
www.multivision.co.uk	www.nec-online.co.uk	www.microanvika.co.uk	www.simply.co.uk	www.timecomputers.com	www.dabs.com	www.watford.co.uk
www.multivision.co.uk	www.nec-online.co.uk	www.samsungelectronics.co.uk	www.vaio.sony-europe.com	www.timecomputers.com	www.toshiba.co.uk	www.watford.co.uk
1yr C&R	1yr C&R	1yr C&R	1yr RTB	3yrs RTB	1yr RTB international	1yr RTB
312 x 272	329 x 269	320 x 265	324 x 266	327 x 275	330 x 290	330 x 270
41	39	42-44	38-47	46-50	45-49	33-39
2.85	3.00	2.80	3.10	3.40	3.30	2.85
1.8GHz Intel Pentium 4-M	1.8GHz Intel Pentium 4-M	1.8GHz Intel Pentium 4	1.2GHz AMD Athlon XP 1400+	1.7GHz Intel Celeron	1.8GHz Intel Mobile Celeron	2GHz Intel Pentium 4-M
Mobile	Mobile	Desktop	Mobile	Desktop	Mobile	Mobile
512KB	512KB	512KB	256KB	128KB	256KB	512KB
Intel 845	ATI RS200M (U2)	Intel 845GL	VIA KT133A	SiS650	Intel 845	SiS651 + SiS962
256MB PC2100	256MB PC2100	256MB PC133	256MB PC133	256MB PC2100	256MB PC2100	256MB PC2100
768MB	768MB	768MB	768MB	768MB	512MB	1.25GB
1/2	1/2	1/2	1/2	1/2	1/2	1/2
14.1	14.1	14.1	14.1	14.1	14.1	14.1
1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768
Nvidia GeForce4 420 Go	ATI Radeon IGP 340M	Intel 82845G	ATI Rage Mobility-M1	SiS650	Nvidia GeForce4 420 Go	SiS651
32MB	32MB shared****	Dynamically assigned	8MB	64MB shared****	16MB	32MB shared****
✓	✓	✗	✓	✓	✓	✓
S-Video	S-Video	S-Video	S-Video/composite convertor	S-Video	Composite video	S-Video
Fujitsu MHR2030AT	Hitachi DK23DA-40	IBM Travelstar 40GN	Hitachi DK23DA-20	Fujitsu MHN2200AT	IBM Travelstar 40GN	IBM Travelstar 40GN
4,200	4,200	4,200	4,200	4,200	4,200	4,200
✓	✗	✓	✓	✓	✓	✓
30GB	40GB	20GB	20GB	20GB	30GB	30GB
27.9GB	34.7GB	18.6GB	18.6GB	18.6GB	27.9GB	27.9GB
✗	✓ (integrated)	✗	✓ (removable)	✗	✓ (integrated)	✗
DVD/CD-RW: Toshiba SD-R2212 (8x DVD, 16x/10x/24x CD-RW)	DVD/CD-RW: Toshiba SD-R2212 (8x DVD, 16x/10x/24x CD-RW)	DVD/CD-RW: Toshiba SD-R2212 (8x DVD, 16x/10x/24x CD-RW)	DVD: QSI SDR-081 (8x/24x)	DVD: Panasonic SR-8176 (8x/24x)	DVD/CD-RW: Toshiba SD-R2212 (8x DVD, 16x/10x/24x CD-RW)	DVD/CD-RW: QSI SBW-161 (8x DVD, 8x/8x/24x CD-RW)
✗	DVD-ROM, CD-ROM	✗	✗	✗	✗	✗
Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion
3,900	4,800	Not stated	3,000	6,000	4,500	3,600
£89 (£105)	Not yet known	£99 (£116)	£144 (£169)	£82 (£96)	£75 (£88)	Not available
SmartLink 56K (V.90)	Agere Systems AC97 (V.92)	SENS LT56ADW (V.90)	Conexant Soft56K (V.90)	HSP56 MR-M8575 (V.90)	Toshiba Software (V.90)	HSP56 (V.90)
Realtek RTL8139 (10/100)	Realtek RTL8139 (10/100)	Intel PRO/100 VE (10/100)	Realtek RTL8139 (10/100)	SiS900 (10/100)	Intel PRO/100 VE (10/100)	SiS900 (10/100)
✗	✗	✗	✗	✗	✓	✗
✗	✗	✗	✗	✗	Optional WiFi mini-PCI	✗
✓	✓	✓	✓	✓	✓	✓
2 Type II	2 Type II	1 Type II	2 Type II	1 Type II	2 Type II	1 Type II
3 USB 1.1	3 USB 1.1	2 USB 2	2 USB 1.1	4 USB 1.1	3 USB 1.1	2 USB 2
1 (four-pin)	1 (four-pin)	1 (four-pin)	1 (four-pin)	1 (four-pin)	✗	1 (four-pin)
✓	✗	✗	✗	✓	✓	✓
✗	✓	✓	✓	✗	✗	✗
✓	✓	✓	✓	✓	✓	✓
✗	✗	✗	✗	✗	✗	✗
✗	✗	✓ (Optical)	✗	✓	✗	✗
SmartMedia	✗	✗	✗	✗	✗	✗
Trackpad	Trackpad	Trackpad	Trackpad	Trackpad	Trackpad	Trackpad
✗	✗	✗	✗	✗	✗	✗
Avance AC97	SoundMAX Digital Audio	Crystal WDM Audio	VIA Audio	Avance AC97	Yamaha AC-XG	Avance AC97
Chassis sides	Chin	Chin	Above keyboard	Chin	Above keyboard	Above keyboard
✗	✗	✓	✗	✓	✗	✗
✗	✗	✗	✗	✓	✗	Carry wallet
✗	✗	✗	✗	✗	✗	✗
Windows XP Home	Windows XP Professional	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Professional	Windows XP Home SP 1
Recovery CD	Backup partition	Recovery CD	Recovery CD	Recovery CD	Recovery CD	Windows CD
Lotus SmartSuite Millennium 9.7	Microsoft Word XP, Money 2002	Microsoft Works Suite 2002, MGI PhotoStudio III SE, MGI VideoStudio IV SE	Sony multimedia bundle	✗	✗	Ability Office

****Extended Desktop means the display can be spread across both the notebook's TFT and a second monitor.



AJP 8640

PRICE £999 (£1,174 inc VAT)

SUPPLIER AJP Computers 020 8208 9747

VERDICT The 8640 offers a superb combination of power, features and screen quality, with only a lack of portability counting against it.

With a weight of 3.5kg, the AJP 8640 truly deserves the overused term desktop replacement. There's a 2.4GHz desktop Pentium 4 processor married to 512MB of PC2700 memory, while a 40GB hard disk provides ample storage. It's one of the biggest notebooks here too, measuring 332mm wide and 40-47mm tall.

The 8640 isn't then the natural choice for someone looking for a highly mobile laptop, especially considering the measly 77 minutes of battery life in our intensive tests. However, this extended to a more reasonable three hours under light use, thanks in no small part to the capacious 6,000mAh battery. It also suffers from the usual problems we associate with using desktop

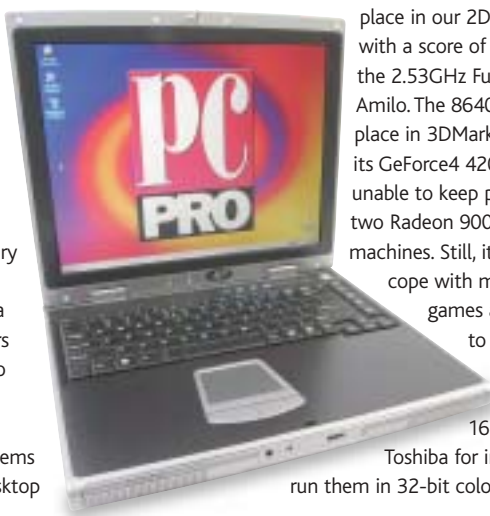
processors; namely, the bottom of the chassis gets hot and the fan frequently kicks in to keep the chip cool.

These problems make the 8640 a poor choice for use on the move, but it's on the desk where this notebook excels. It claimed second

place in our 2D benchmarks with a score of 1.13, only trailing the 2.53GHz Fujitsu Siemens Amilo. The 8640 slipped to third place in 3DMark2001 SE, with its GeForce4 420 Go graphics unable to keep pace with the two Radeon 9000-powered machines. Still, it will happily

cope with modern games and, thanks to 32MB of video memory – as opposed to 16MB in the

Toshiba for instance – it will run them in 32-bit colour too.

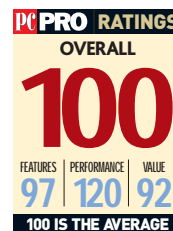


The 14.1in TFT screen is good enough to cope with fast-moving graphics, although its viewing angles can't match those of the ThinkPad or Satellite Pro. Still, it's bright and boasts good contrast, so whites look white. We like the keyboard too, even if a full-height Enter key and larger spacebar would help less accurate typists. A nice touch is the four programmable shortcut keys above the keyboard.

If you're a digital photographer, you'll also appreciate the versatile memory reader integrated into the chassis. This can read from SD/MMC cards, Memory Sticks and SmartMedia. With four USB 2 ports, FireWire plus the usual medley of legacy ports, the 8640 is one of the best-connected notebooks here. Only the single PC Card slot lets it down. Then again, it already boasts integrated WLAN – a feature that's becoming increasingly popular in the office, home and public hotspots such as hotels and airports.

With a combo DVD/CD-RW drive rounding the 8640 off, it's undoubtedly a heavyweight contender this month.

If the full warranty had been slightly better than just a single year's return-to-base cover – with the second year labour-only – AJP would have been challenging for awards.



Asus M2417E-DVD

PRICE £950 (£1,116 inc VAT)

SUPPLIER Viper Systems 01905 420467

VERDICT Good battery life alongside fantastic build quality, sleek looks and a low weight make this our favourite choice for the mobile professional.

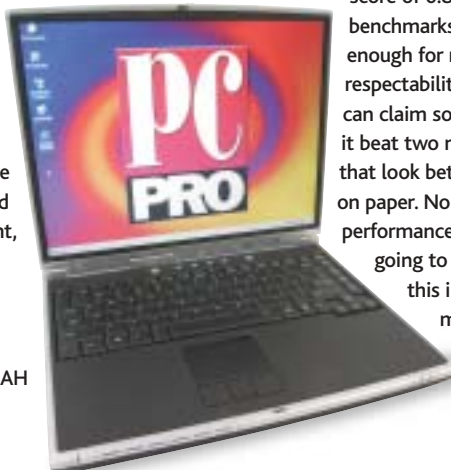
You've got to feel sorry for notebook manufacturers sometimes – how can they pack in all the features users want and keep the device portable? After all, the larger the battery, the bigger you have to make the chassis, and the heavier the notebook. Nevertheless, Asus makes a near perfect compromise between battery life and portability, which should win the M2417E-DVD many admirers.

It's also worth noting that our panel of judges rated the Asus as the most stylish notebook here, with its brushed magnesium alloy lid complemented by a black-and-silver theme running throughout the chassis. With a width of 305mm and height of 32mm at its smallest point, it's also sleek enough to fit into a briefcase, while a weight of 2.45kg means it won't weigh you down by the end of the day.

There's only room for a 4,000mAh

battery in this minimalist design, but thanks to the 1.7GHz Pentium 4-M chip's low power demands the M2417E still managed to last for three hours, 45 minutes in our light-use battery tests. Yes, three other notebooks beat this, but you pay the penalty in extra weight and girth.

The M2417E couldn't match these excellent results in our speed tests, with its score of 0.81 in our 2D benchmarks only good enough for mid-table respectability. Still, Asus can claim some kudos as it beat two notebooks that look better specified on paper. No amount of performance tweaking is going to transform this into a games machine, though, with the

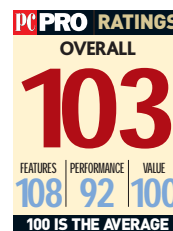


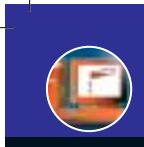
integrated SiS650 graphics only enough for 1,411 3DMarks, even when we dropped the settings to 16-bit.

Asus also falls behind some rivals when it comes to out-and-out hardware specs, with a lowly 20GB hard disk and mere DVD-ROM – most notebooks here boast CD-RW capability. It's also a shame the USB ports are just 1.1 specification, although the S/PDIF output and FireWire port help to make up for this. Another nice and surprisingly unusual touch is that Asus includes a miniature USB mouse, although we found the touchpad perfectly responsive.

We're also delighted to see WLAN integrated into this machine, not to mention Windows XP Professional. Only the return-to-base warranty will put off business buyers, but at least this lasts for two years.

With a solid keyboard matched by a high-quality, well-lit screen, there's a lot to like about the M2417E. Businesses should definitely take a look, as should consumers wanting a fully featured notebook to take on the move. The M2417E may only cost £950, but any compromises haven't been at the expense of quality, merely at specification, and that's easy enough to increase by paying a little extra.





ECS Green 732

PRICE £979 (£1,150 inc VAT)

SUPPLIER Centerprise 01256 378000

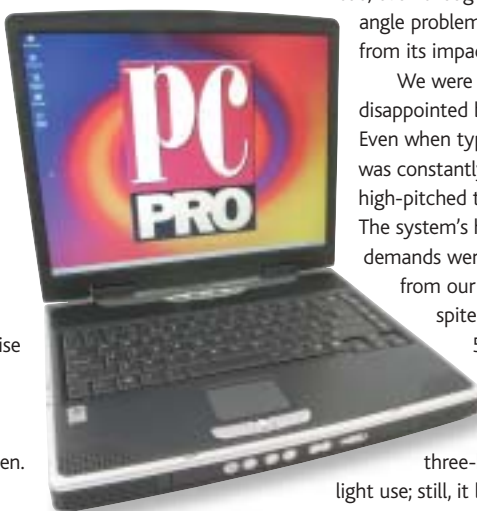
VERDICT A high-resolution screen and superb performance in both 2D and 3D make this notebook stand out, but a noisy fan counts against it.

Most people will know ECS (Elitegroup Computer Systems) for its motherboards, but this Taiwanese company has already shown itself an innovator in the notebook market with the DeskNote – a notebook without a battery, which some British companies are already selling under their own name. The bizarrely named Green 732 is very much a conventional desktop replacement, though, with a 2GHz desktop Pentium 4 processor squeezed into its 3.8kg chassis.

It should be no surprise that the Green is the heaviest notebook here, but there's immediate compensation in the screen. Instead of the standard

1,024 x 768 resolution, ECS stretches to a 1,400 x 1,050 TFT. In our opinion, this is the perfect choice for a 15in diagonal, although the icons and system text may be a little too small for some people's liking. It's a good-quality panel too, even though the usual viewing angle problems detract slightly from its impact.

We were also a little disappointed by the fan volume. Even when typing in Word, the fan was constantly on, and it's too high-pitched to ignore completely. The system's high cooling demands were also in evidence from our battery tests. In spite of the massive 5,880mAh battery, this notebook only just managed to break the three-hour barrier under light use; still, it lasted for a highly



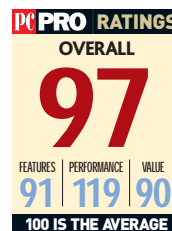
respectable 103 minutes with the processor running at full tilt.

As with other notebooks that use a desktop chip, the Green 732 isn't designed for life on the move anyway. Instead, it was built for performance, which showed in our benchmarks. It scored 0.97 in 2D – on a par with 2GHz desktop systems – and thanks to ATI's Radeon 9000 graphics it managed 6,817 in 3DMark2001 SE at 16-bit colour. Even with 32-bit colour, it scored 6,269.

ECS packs a respectable number of features into the Green 732 too, with a combo DVD/CD-RW drive being the highlight. We also appreciate the four USB 2 ports, with a FireWire port on offer as well.

However, there's no room in the chassis for a floppy drive, there's only one PC Card slot and, although an infrared port is included, it's inconveniently located around the back. But the biggest disappointment is the 20GB hard disk, which seems out of kilter with the rest of this machine's specification.

What finally prevents ECS from challenging for awards this month, though, is the fan noise. AJP offers a similar level of power and more features – the only reason to buy the Green 732 is its superior screen.



Fujitsu Siemens Amilo D 7820

PRICE £999 (£1,174 inc VAT)

SUPPLIER Nice PC 0870 606 6677

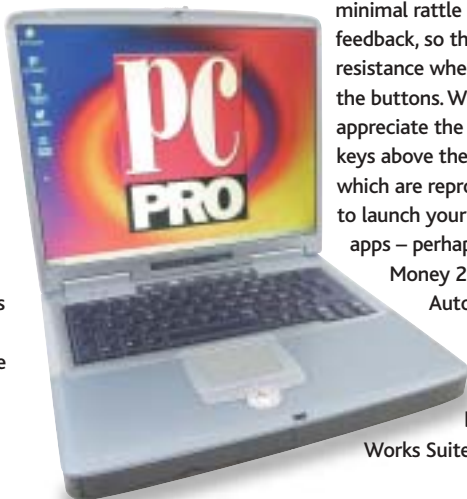
VERDICT Awesome power in both 2D and 3D made the Amilo the fastest notebook on test, with our only real disappointment being the screen.

If you made buying decisions by specs alone, the Amilo would be at the top of your shortlist. With a 2.53GHz Pentium 4 processor, 256MB of DDR memory and ATI Radeon 9000 graphics, this is a notebook that can almost outmuscle desktop systems. It certainly outdid all its notebook rivals here in our benchmarks, with a chart-topping tally of 1.24 in our 2D benchmarks and a stunning 7,752 in 3DMark2001 SE (at 16-bit settings).

As such, it's the best choice here for gamers, even though we don't generally recommend notebooks for games, as you can't upgrade the graphics. Still, we were happy with the screen's performance when coping with fast-moving images; there's little sign of the lag that earned TFT screens such a bad gaming reputation in their early years.

When it comes to working in everyday apps like Excel, though, the TFT screen doesn't quite match our expectations. Whites don't look white, with an off-colour hue spoiling the general effect.

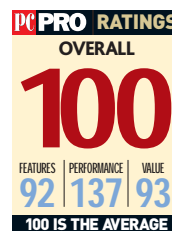
We've no complaints about the keyboard, which is quite nice to type on thanks to minimal rattle and tactile feedback, so there's a bit of resistance when you press the buttons. We also appreciate the five shortcut keys above the keyboard, which are reprogrammable to launch your favourite apps – perhaps Word XP, Money 2003 and AutoRoute 2002, all of which are included in the bundled Works Suite 2003.



There are plenty of features on offer in the Amilo too, with a combo DVD/CD-RW drive being the pick of the bunch. The sole feature we'd like to upgrade is the 20GB hard disk, which – like the Green 732 – seems out of sync with the rest of the machine's spec. The only way to buy a larger disk (apart from upgrading later) is to opt for the Amilo D 8820, which costs an extra £107.

Both machines share the same chassis, which isn't built for portability. It weighs 3.6kg and measures 44-48mm from top to bottom – we wouldn't want to carry it around all day. It's got battery life to match too, giving up after 97 minutes in our intensive tests and 169 minutes under minimal use. This is partially due to the desktop processor, which consumes more energy and consequently requires more cooling, and we found the fan kicked in quite loudly on occasion.

With an integrated floppy drive and all the expected ports, including USB 2, to complement its various features and great performance, the Amilo D 7820 is undoubtedly one of the best buys here. Only the lacklustre screen and its sheer bulk count against it, but it remains a sound alternative to our award winners.





Hi-Grade Notino 4400-1800

PRICE £999 (£1,174 inc VAT)

SUPPLIER Hi-Grade 020 8532 6113

VERDICT The DVD burner and superb warranty lift the Notino above the rest, while plenty of 2D power makes it a great all-purpose notebook.

To look at, the Notino 4400-1800 doesn't seem anything special. Sure, it's got a 1.8GHz Pentium 4-M processor, 256MB of DDR memory and a 40GB hard disk, but that's hardly exceptional in this competitive group test. But the Notino has something hidden up its sleeve, or more precisely its optical drive bay: a DVD burner. To put this into perspective, few sub-£1,000 PCs include a DVD burner yet.

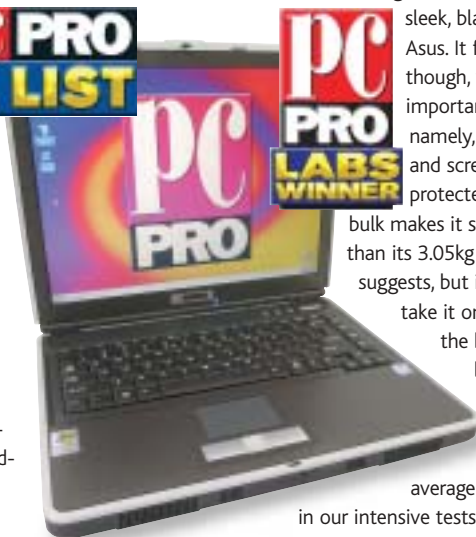
True, a desktop's DVD burner produces DVD discs much more quickly, with the Toshiba SD-R6012 drive only burning DVD-R discs at single-speed compared with the quad-speed of Pioneer's DVR-A05 (see p95). But the ability to burn high-quality video discs

brings a new level of ability to the notebook.

However, this isn't the most desirable laptop around, with its curiously coloured chassis and 43mm height no match for the sleek, black and silver Asus. It feels well built though, with the most important areas – namely, the hard disk and screen – well protected. The Notino's bulk makes it seem heavier than its 3.05kg weight suggests, but if you decide to take it on your travels the battery should last for about as long as you do. It only managed an average of 82 minutes in our intensive tests, but edged over the three-hour mark under light use.

PC PRO
A LIST

PC PRO
LABS
WINNER



The Notino also proved a capable performer in our 2D benchmarks, with its score of 0.86 earning Hi-Grade respectable, mid-table status. We were actually hoping for more than this – the Notino's Hitachi hard disk is the fastest on test, at least on paper, thanks to its 5,400rpm speed. Games enthusiasts should definitely steer clear, though, with the SiS650 integrated graphics proving unimpressive in 3DMark2001 SE, scoring only 1,613 3DMarks (with 16-bit settings).

Others also beat the Notino for ergonomics, with its screen's mediocre viewing angles giving the impression of uneven backlighting. The keyboard lost it some marks too, but once you get used to the single-height Enter key and mild rattle we doubt you'll even think about it.

Hi-Grade rounds off the Notino with a good selection of ports, including USB 2 and FireWire, with Works 6 the main software of note. But what brings Hi-Grade to the fore this month is the Notino's warranty. Not content with two years' worldwide collect-and-return cover, it throws in accidental damage, so if you drop your notebook or spill juice over the keyboard Hi-Grade will replace or repair it. At just £999, it's a fantastic deal.

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Quick as a Flash

We take a look at the Flash alternative to floppies

Rumours of the floppy's death have been greatly exaggerated, they say, but each time we hear one wheeze its way through a file it sounds increasingly like a death rattle. The only reason the floppy drive is still around is its cheapness and consequent universality – even now, almost every desktop PC comes complete with one.

Notebook manufacturers, on the other hand, are far more careful about what they include in their products. A floppy drive means more weight, more volume and more expense. So it should be no surprise to see only five of the 13 here integrating one.

But the need for easy removable storage hasn't died. Yes, a CD-RW offers an excellent medium for transferring large files, but the media is easy to damage, awkward to carry and there's no guarantee your CD-RW disc will be readable in other PCs.

The obvious alternative is Flash memory. It's a simple concept – attach some Flash memory to a USB connector, wrap it up in plastic and you've got the perfect medium for transferring files quickly from your PC. If you've got Windows XP, you don't even need to worry about drivers, as the USB drive is instantly recognised.

The latest innovation is the jump from USB 1.1 to USB 2, speeding things up from a theoretical 12Mb/sec to 480Mb/sec. However, don't expect speeds to increase by 40 times. While Sony's USB 2 Micro Vault transferred 61MB of JPEG photos in 72 seconds, it took Lexar Media's USB 1.1 JumpDrive just 23 seconds more.

By comparison, the Fujitsu Siemens Amilo D 7820 took 80 seconds to write the files to a CD-RW using InCD (this treats the CD-RW disc like a huge floppy disk). And the floppy? Well, we wrote two of the files, totalling 1.1MB, to a floppy



Lexar's JumpDrive is notably smaller than Sony's offering.

disk in 36 seconds. If we'd continued for the other 109 photos, it would have taken around 30 minutes.

But the biggest benefit of Flash memory is its portability. You can't stick a CD into most pockets, nor the 178 floppy disks that are equivalent to 256MB of storage. Add easy installation, good reliability and Flash memory's turn of pace, and it's no wonder the floppy is an endangered species.

TIM DANTON

Lexar Media 64MB JumpDrive

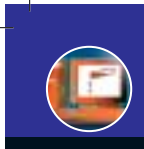
PRICE £55 (£65 inc VAT)

SUPPLIER dabs.com 0800 138 5182

Sony Micro Vault USM-256U2

PRICE £130 (£153 inc VAT)

SUPPLIER Sony www.sonymstyle.co.uk



IBM ThinkPad R31

PRICE £639 (£751 inc VAT)

SUPPLIER dabs.com 0800 138 5182

VERDICT It may be the cheapest notebook here, but the ThinkPad R31 offers the best screen and keyboard and is backed up by IBM's superb record for reliability and service.

We sometimes get the feeling that ThinkPads will look the same in 50 years' time as they do today. It's easy to follow IBM's conservative reasoning. The black, angular look is hardly the most stylish, but no-one would be embarrassed by pulling out a ThinkPad when on the train. The R31 also benefits from being quite small, a fact reflected in its 2.6kg weight.

Like Asus, IBM gets the balance between portability and battery life just right, with the R31 lasting two minutes shy of four hours in our light-use battery test. Where IBM takes a different approach is the amount of processing power it includes. There's just a 1.2GHz mobile

Celeron in this version of the R31 (stock code TR1MLUK) and it's backed up by a mere 128MB of PC133 memory.

So it was no surprise when the R31 trundled

in last in our 2D benchmarks, scoring just 0.61. We recommend upgrading the memory to 256MB, as this will also help Windows to run more smoothly. There's no way to boost the ThinkPad's 3D power, though, with Intel's integrated graphics only enough for 953 3DMarks (with 16-bit settings).

IBM also compromises on the hardware included, with just a CD-ROM and 20GB hard disk. Thankfully, the Ultrabay Plus, which holds the CD-ROM, is compatible with many IBM drives, including a combo DVD/CD-RW

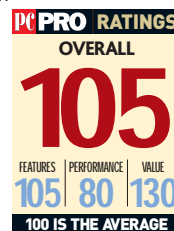


drive, second hard disk, floppy drive and more. Just beware that the costs soon mount up. For instance, a floppy drive costs £51, while a combo DVD/CD-RW is listed for a ridiculous £293.

The ThinkPad always wins out, though, with the quality of the components. Even though this machine costs just £639, the TFT screen and keyboard are the best here. Touch typists will love the keyboard, as it offers large, easy-to-hit keys and a well thought-out layout. IBM only loses points for not including a Windows key (handy for shortcuts), and it's now virtually alone in the industry in thinking that a trackpoint is a better idea than a trackpad.

Newcomers to notebooks will appreciate the Access ThinkPad guide, which offers an easy way to learn how to get the most from a laptop. However, there's no other software of note, and the one-year, return-to-base warranty is too little for our liking. Then again, IBM's notebooks have come top for reliability in our annual survey for four years running, so hopefully this won't be an issue. And if there is a problem, IBM's support has again won

several awards in *PC Pro*. As such, the ThinkPad R31 is a great choice for the less demanding user who wants peace of mind rather than lots of features or performance.



Multivision Visage

PRICE £799 (£939 inc VAT)

SUPPLIER Multivision 0870 066 0880

VERDICT The Visage remains a great buy if you want 3D power and mobility in one package, and at this price it's an amazing deal.

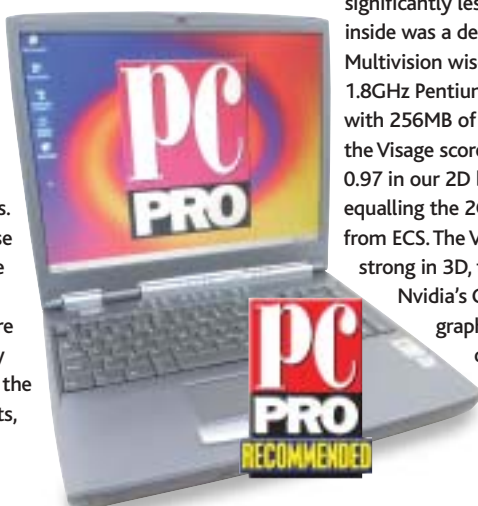
When the Multivision Visage first appeared in *PC Pro* (see *Reviews*, issue 97, p125) it caused quite a stir. For the first time, you could pay less than £1,000 for a notebook that was powerful in both 2D and 3D. Since then, Toshiba and many others have followed Multivision's lead, but the Visage remains the cheapest laptop on which you can play all modern games.

But let's get this notebook's Achilles heel out of the way first – the lid catch. It may sound like a minor irritation, but whenever you open this machine it's a battle of wills. This is a shame, as otherwise there's little wrong with the Visage's build quality. Yes, the chassis and screen lid are all made of plastic, but they offer good protection to all the most important components,

without making the Visage bulky or heavy.

In fact, at 2.85kg, the Visage is one of the most portable notebooks here. However, the perennial sacrifice is battery capacity, and the Visage's 3,900mAh battery was enough for only three hours' life under light use, and Multivision charges a hefty £89 for a second.

The battery life would have been significantly less if the processor inside was a desktop chip, but Multivision wisely opts for a 1.8GHz Pentium 4-M. Coupled with 256MB of DDR memory, the Visage scored an impressive 0.97 in our 2D benchmarks, equalling the 2GHz machine from ECS. The Visage is similarly strong in 3D, thanks to Nvidia's GeForce4 420 Go graphics. With 32MB of dedicated video memory, it

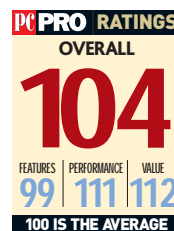


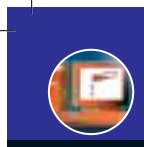
scored a highly respectable 4,074 3DMarks in 32-bit colour.

You might expect compromises on ergonomics for Multivision to squeeze all this power into an £799 machine, but the Visage can hold its head up high for both screen and keyboard quality. The screen produces a vibrant image in both 2D and 3D, while the keyboard is pleasant to type on. Our only criticisms regard the placing of the Windows key – at the top-right rather than bottom-left – and the cursor keys not being separated out.

It's good to see Multivision includes a 30GB rather than 20GB hard disk, while the chassis includes all the ports we'd expect. There's even a SmartMedia slot, which helps compensate for the lack of a floppy and the USB ports' 1.1 specification. Don't expect luxuries like WLAN or a carry case, though.

We should also point out that Multivision is a new entrant into the notebook market, and it consequently has no history for customer support in this area. If you want peace of mind, our annual Reliability and Service Awards have previously shown that no-one can match IBM. But if you're looking for a bargain notebook with plenty of features and power, the Visage is a great choice.





NEC Versa M300

PRICE £999 (£1,174 inc VAT)

SUPPLIER NEC Computers UK 0870 010 6322

VERDICT A 3kg all-in-one notebook that offers great battery life, lots of features and respectable performance. It only narrowly misses out on the awards.

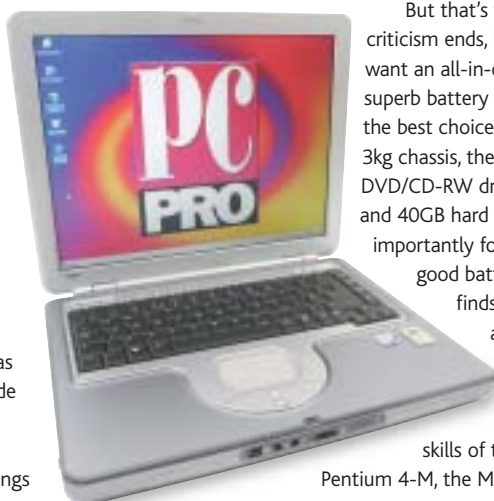
As soon as we took the Versa M300 out of its box, it was obvious NEC knows how to build a quality notebook. Instead of the matte and generally dull finish we've become used to, the Versa has a glossy look that helps it look almost as stylish as the metal alloy finishes of high-end notebooks. It's solid too, with sturdy plastic protecting the all-important screen.

The screen itself is another good-quality inclusion, with bright backlighting and good contrast making 2D work a pleasure. The only area NEC could improve is the viewing angles – as soon as you shift slightly to the side of the screen the image looks darker.

We've got mixed feelings

about the keyboard. Although it's one of the few here that doesn't rattle and the layout is above average, the keys are annoyingly stiff; in particular, the spacebar needed a good thump to make it work. Touch typists might find it irritating.

But that's where our criticism ends, because if you want an all-in-one laptop with superb battery life the Versa is the best choice here. Within its 3kg chassis, there's a combo DVD/CD-RW drive, floppy drive and 40GB hard disk. Most importantly for those wanting good battery life, NEC also finds space for a 4,800mAH battery. Combined with the power-saving skills of the 1.8GHz Pentium 4-M, the M300 lasted for a

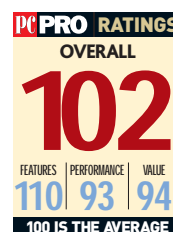


stunning four hours, 13 minutes under light use.

The Versa proved to be a respectable performer in our 2D benchmarks too, with 256MB of DDR memory ensuring a solid score of 0.80. It was more disappointing in 3D, though, with the integrated ATi graphics solution only enough for 1,436 in 3DMark2001 SE (with 32-bit settings). Games enthusiasts should definitely steer clear.

Then again, you don't have to look any further than NEC's software package to see the Versa's business-like intentions. Windows XP Professional is in place rather than XP Home, while Word XP and Money 2002 are provided for everyday use. But NEC doesn't include WLAN in the Versa M300 – surprisingly, the chassis doesn't even contain an aerial for an easy upgrade – and business users will need to upgrade the one-year, collect-and-return warranty.

NEC loses some points with the £45 delivery charge, which seems excessive for a desktop PC, let alone a notebook. Touch-typists should also think twice before buying it. But NEC gets everything else right, with superb build quality, excellent battery life and all the features most people need in one easy-to-carry package.



Samsung V20 XTC 1800

PRICE £850 (£999 inc VAT)

SUPPLIER Micro Anvika 020 7467 6050

VERDICT The V20 boasts the longest battery life of all the notebooks on test and includes its fair share of features, but there's nothing to make it stand out from the crowd.

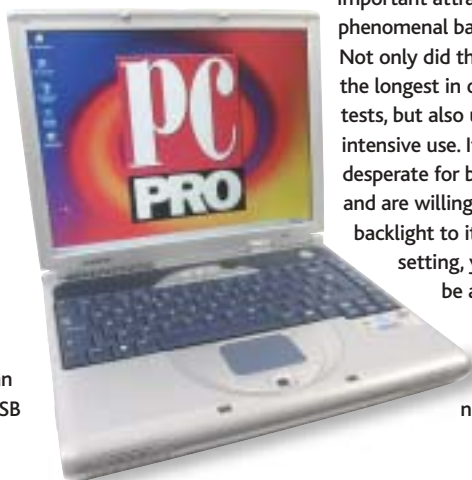
Samsung seems determined to gain market share in the UK for its notebooks – an assertion backed up by the V20's aggressive pricing. For £850, the XTC 1800 includes a 1.8GHz Pentium 4 processor, 256MB of memory (albeit SDR rather than DDR) and a combo DVD/CD-RW drive. And unlike many budget offerings, there's a decent software package too, with Works Suite 2002 the highlight.

Samsung is keen to promote the V20's video-editing abilities, but this claim is rather undermined by the 20GB hard disk. Once you've uploaded your raw video from your DV camcorder via the four-pin FireWire port, there won't be much space for other media-orientated files.

The V20 boasts its fair share of cutting-edge interfaces, with an S/PDIF output, TV out and two USB

2 ports. Anyone with older devices will also be pleased to see a full set of legacy ports. Serial, parallel and PS/2 ports are all here, with the only omission being infrared.

There's no room in this chassis for a floppy drive, though, which is one of the prices you pay for a 2.8kg weight. It's not the slimmest notebook here, but boasts one important attraction – phenomenal battery life. Not only did the V20 last the longest in our light-use tests, but also under intensive use. If you're desperate for battery life and are willing to set the backlight to its lowest setting, you should be able to squeeze four hours out of this notebook.

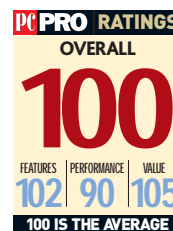


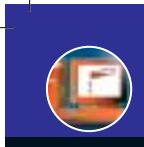
This amount of life is particularly surprising as it's a desktop rather than mobile processor.

The V20 couldn't live up to expectations when it came to speed though. Despite its 1.8GHz processor, it was beaten by the 1.7GHz Asus, which gleaned the benefits of PC2700 as opposed to PC133 memory. Don't expect to play the latest games on the V20 either, with 3DMark2001 SE returning a measly 801 at 1,024 x 768 with 32-bit colour and textures.

For most people, though, quality is more important than outright speed, and we've got few complaints about the Samsung's combination of keyboard and screen. Samsung makes its own TFT panels and has earned a good reputation for them, with the V20's boasting extremely good contrast, albeit only average viewing angles. The keyboard is a pleasure to type on with little rattle and well-sized keys, and we also like the scroll wheel in between the 'mouse' keys.

All this adds up to a highly respectable notebook, and if its performance in both 2D and 3D had been better it would have been challenging for awards. As it stands, it offers good value and superb battery life, but the Asus weighs less and performs better, albeit for more money.





THE LABS
Value notebooks

Sony VAIO PCG-FX801

PRICE £709 (£833 inc VAT)

SUPPLIER Simply 0870 729 7365

VERDICT A good-value notebook from the ever-popular VAIO series, offering good ergonomics but little in the way of battery life or 3D performance.

The last VAIO we saw in *PC Pro's* Labs was the PCG-GRX416SP (see *Labs*, issue 95, p54), costing a mammoth £2,369 and boasting cutting-edge graphics, a 16.1in TFT and the latest Pentium 4-M processor.

The FX801 couldn't be more different. This is Sony's most basic laptop, with the only 'exciting' extra being an i.LINK port (FireWire to everyone else). In return, the price drops to a much more reasonable £709.

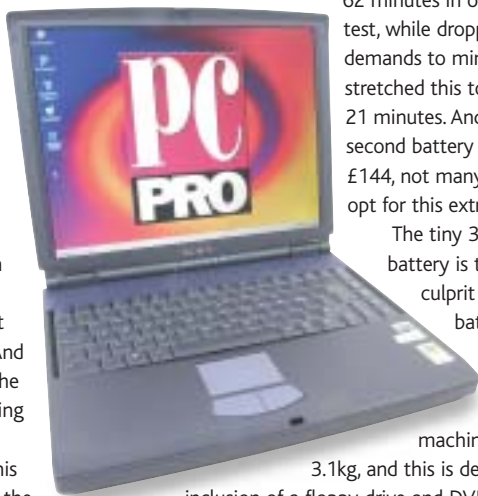
The good news is that Sony doesn't compromise on quality. We're fans of the keyboard, with the wide chassis allowing for well-sized keys, despite Sony not separating out the cursor keys. And the 14.1in TFT screen is one of the best here, with respectable viewing angles and bright backlighting, although if you want to lower this you'll have to look up how to in the

manual (okay, we'll tell you: press <Shift-Fn-F4> – obvious really).

If battery life is important to you, you'll be lowering the backlight frequently. The VAIO was the worst performer on test, lasting a measly

62 minutes in our intensive test, while dropping all demands to minimum only stretched this to two hours, 21 minutes. And with a second battery costing £144, not many people will opt for this extra.

The tiny 3,000mAH battery is the main culprit for this poor battery life, but in return you get a portable machine weighing 3.1kg, and this is despite the inclusion of a floppy drive and DVD-ROM (both

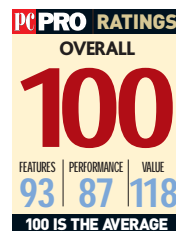


of which are removable). There's respectable connectivity too, with two PC Card slots, two USB 1.1 ports, plus parallel and serial connectors.

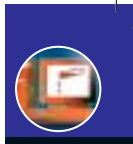
Another sign of cost compromises is the 20GB hard disk, which reduces this notebook's appeal as the centre of your digital world. Some people's CD collection ripped to MP3 would consume this space. Nevertheless, Sony bundles its usual collection of video and music software, and the FX801 is fast enough to cope with video-editing tasks.

This is thanks to the 1.2GHz mobile Athlon XP 1400+ processor, which showed itself to be a great performer – the VAIO rivalled many notebooks powered by 1.8GHz Pentium 4-M chips. This was despite the handicap of PC133 memory – there's room for one more SODIMM if you want to boost the 256MB included. But even the Athlon XP processor can't transform the VAIO into a 3D games machine, with the Rage Mobility-M1 unable to cope with 3DMark2001 SE, partially thanks to only 8MB of video memory.

The FX801 offers excellent value for money, and Sony's good performance in our Reliability & Service Awards 2002 counts in its favour. Just beware of the poor battery life and a lack of luxuries.



*£28 a month standard. Free connection offer ends 31/03/03. Standard price £60. Standard equipment costs £80. Subject to availability & survey. BT line required. Minimum 12 month term from connection. Normal phone call charges apply and other conditions apply.



Time Traveller P4-Cel 1700

PRICE £784 (£921 inc VAT)

SUPPLIER Time Computers 01282 777555

VERDICT The Traveller boasts impressive specs for the price, but its performance lagged behind the rest in our benchmarks and its design is looking distinctly dated

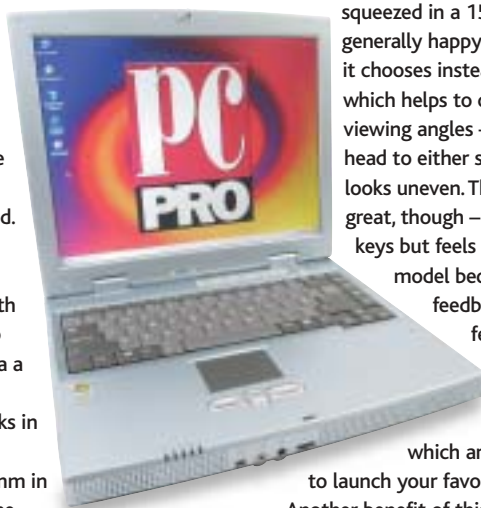
The Time Traveller is from the old school of budget notebook design: it's big, it's blocky, but when you see the hardware included for the price it's tempting. After all, Time is offering a 1.7GHz Celeron, 256MB of DDR memory, a 20GB hard disk and DVD-ROM for almost £200 less than the similarly specified Asus.

But that's where the similarities between these two notebooks end. The Time is for sticking on a desk and only occasionally moving, with a power-hungry desktop processor in evidence via a palmrest that gets too warm and a fan that kicks in too often. It also weighs 3.4kg and measures 50mm in height, putting it near the

bottom of our list for portability. Even with a 6,000mAH battery, it struggled to provide more than two-and-a-half hours of battery life under light use.

With such a large chassis, Time could have squeezed in a 15in screen, but we're generally happy with the 14.1in TFT it chooses instead. It's brightly lit, which helps to counteract the poor viewing angles – if you shift your head to either side, the lighting looks uneven. The keyboard isn't great, though – it may have large keys but feels like an economy model because of its poor feedback. One redeeming feature is the set of five shortcut keys above the keyboard, all of which are programmable to launch your favourite apps.

Another benefit of this chassis is the

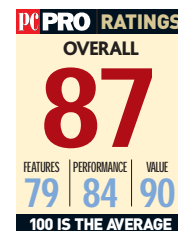


front-mounted FireWire port, kept company by an S/PDIF out, microphone jack and hardware volume control. Add a parallel and four USB 1.1 ports round the back, plus an infrared port on the right-hand side, and the Time Traveller should be well enough connected for most people. Considering the chassis' height, though, a single PC Card slot is disappointing.

You'll also be disappointed if you wanted a games-playing machine, as the integrated SiS650 graphics are no match for 3DMark2001 SE. A score of 1,075 in 32-bit colour, XGA resolution, translates to around 10 frames per second. It was also poor in our 2D benchmarks, scoring 0.65 when we expected closer to 0.80.

One area where Time should be congratulated is for the warranty. It's the only manufacturer on test to include three years of cover, albeit return-to-base rather than collect-and-return, so if something does go wrong you'll have to pay the courier costs. The only surprise is the lack of software bundled, although Time can claim kudos for including a carry case.

In spite of the occasional plus – like the warranty and low price – we can't recommend the Time Traveller. If you're on a tight budget, buy the IBM ThinkPad instead.



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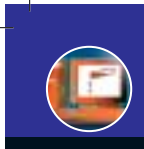
(Avoids all those flying kicks around the house.)



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Toshiba Satellite Pro 2100

PRICE £974 (£1,144 inc VAT)

SUPPLIER dabs.com 0800 138 5182

VERDICT The Satellite Pro 2100 is a fine choice if you want the reassurance of a big-name brand, thanks to a superb screen, solid features and respectable performance.

The Satellite Pro stormed onto our A List three months ago (see *Reviews*, issue 98, p132), earning the fulsome praise: 'a high-quality notebook for a bargain price'. We were curious to see how it would perform when matched against the latest batch of high-value notebooks and, although it couldn't retain its A-listed status, it remains a *PC Pro* favourite.

The foundation for the Satellite Pro's success is the quality of the screen. It's the best lit of all the notebooks here, while superb contrast means Word and Excel are a joy to use. It even copes well in games, which is good news considering the GeForce4 graphics Toshiba uses. The only area where we'd criticise this notebook's ergonomics are the slightly rattly keys and a small

spacebar, but these aren't big problems.

It's not the smallest of notebooks, with a 45mm height and 3.3kg weight, but the Satellite Pro boasts extremely good build quality. You get the feeling it's been designed from the ground up, while other budget

notebooks have a generic modular design. The end result is an attractive piece of kit we'd be happy to be seen with on the train. However, don't expect superb battery life – the Pro is unable to last three hours even under light use.

This is in spite of Toshiba opting for a mobile Celeron processor, which shares many of the power-saving features of the

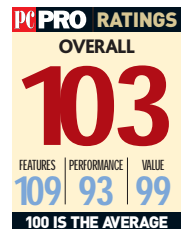


Pentium 4-M. The 1.8GHz chip, coupled with 256MB of DDR memory, gave the Pro 2100 a score of 0.77 in our 2D benchmarks – not inspirational, but good enough. The Satellite climbed higher up the table in 3DMark2001 SE, despite not running the benchmark in 32-bit colour. Still, a 16-bit score of 4,241 shows it will cope with current games – just beware that they won't look as good.

It's a versatile notebook too, with a fast 16x/10x/24x combo DVD/CD-RW drive included in the price. Unfortunately, this archiving ability might become necessary, as the 30GB hard disk's spare space could easily be consumed within the notebook's lifetime.

We have other criticisms of this notebook too. For instance, it would have been nice to have USB 2 rather than USB 1.1 ports, there's no notable software bundled, and the one-year warranty – while being international – is only return-to-base.

Nevertheless, the overall quality, combined with speed where you need it, makes it a fine choice. We also appreciate the integrated aerial giving you the option of upgrading to WLAN. All these features, plus the inclusion of Windows XP Professional, make it a great alternative to our award winners.



Watford Precision 550

PRICE £999 (£1,174 inc VAT)

SUPPLIER Watford Electronics 0870 220 0700

VERDICT One of the most attractive notebooks on test, and it packs its fair share of features too. Just beware of its relatively poor battery life.

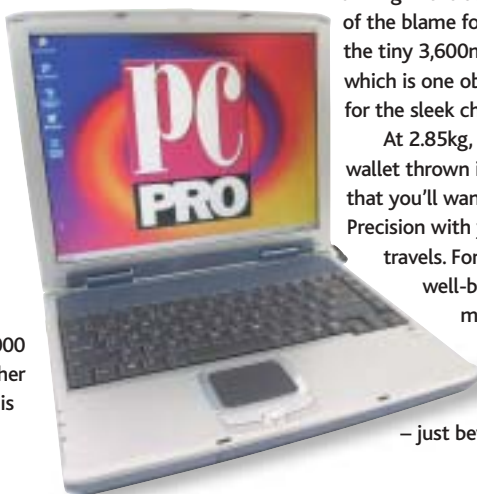
We can well imagine the calls to Watford Electronics' support line: 'You seem to have sent us the wrong laptop – we only spent £999, but you've sent us a luxury notebook.' Thanks to a sleek and stylish chassis, the Precision looks like it could cost £2,000 rather than £1,000, so we were keen to see how it performed in our tests.

In terms of 2D performance, we had no complaints. The Precision's score of 0.89 is a fair reflection of its 2GHz Pentium 4-M processor, and we found it charged along under general Windows use. Look elsewhere if you're a games fan, though, as this notebook failed to reach 2,000 in 3DMark2001 SE using either 16-bit or 32-bit colour. This is due to the integrated SiS

graphics as opposed to a separate chip from Nvidia or ATI.

A bigger disappointment was to come in our battery tests. The 550 managed just 85 minutes under intensive use, and this stretched to a mere two hours, 21 minutes with the backlight set to minimum and with a timer running in the background. Much of the blame for this rests on the tiny 3,600mAh battery, which is one obvious sacrifice for the sleek chassis.

At 2.85kg, and with a carry wallet thrown in, the irony is that you'll want to take the Precision with you on your travels. For instance, the well-built chassis means it would survive the travails of mobile life well – just beware of the



lowly one-year, return-to-base warranty should something go wrong.

We were particularly pleased to see a metal-alloy lid in place to protect the screen, as this is the most expensive component to replace. However, compared with the IBM and Toshiba entries, Watford's TFT lacks consistent backlighting. Viewing angles aren't the best either, but its contrast is good. What's more, the keyboard can't match the best here, with plenty of rattle and not much feedback from the keys, although it's still usable.

In spite of this notebook's diminutive stature, Watford packs in a DVD/CD-RW combo drive and 30GB hard disk. As ever, we'd have liked a larger hard disk, but with good housekeeping the 27.9GB of available space should prove enough. There's no floppy disk, but as we noted in 'Quick as a Flash' (see p66), this isn't a hardship anymore. It's good to see USB 2 ports available for attaching fast external devices too, while a FireWire port could be equally useful.

Overall, though, the Precision 550 doesn't pack enough to make it an award winner. We love the chassis, but the disappointing battery life and mediocre ergonomics detract from its appeal.

