Power notebooks

We put 13 of the most powerful notebooks through our battery of tests

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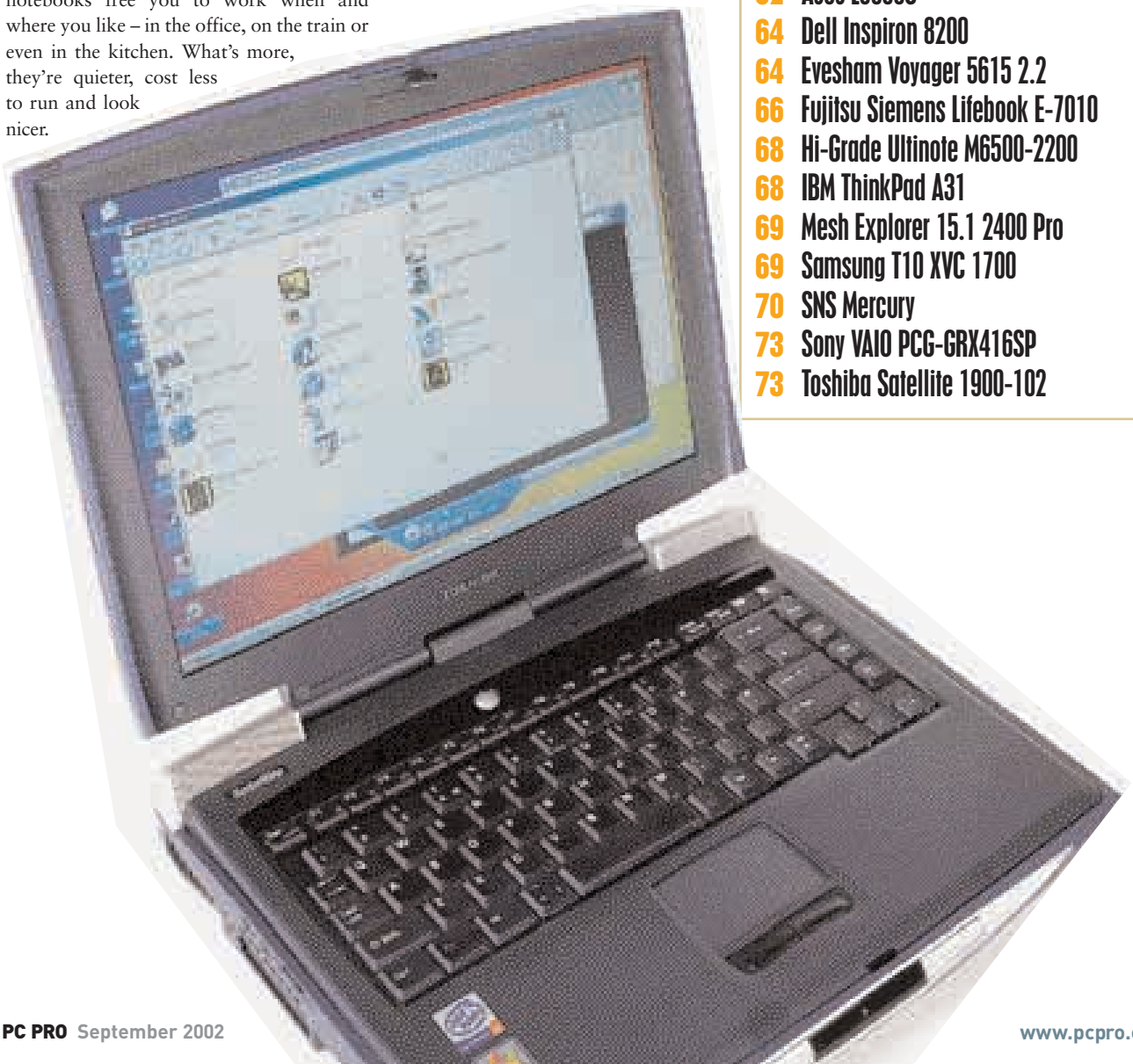
You don't need to be Nostradamus to predict the ultimate demise of the desktop PC. Last year, sales of desktop PCs dropped for the first time ever, while notebook sales continued to increase. The same pattern continues this year, with the notebook market up by 10 per cent in the first quarter, while desktops tumbled by 4 per cent (source: IDC).

The notebook's allure is easy to see. Unlike the behemoth of a beige box that dominates an office or spare room, notebooks free you to work when and where you like – in the office, on the train or even in the kitchen. What's more, they're quieter, cost less to run and look nicer.



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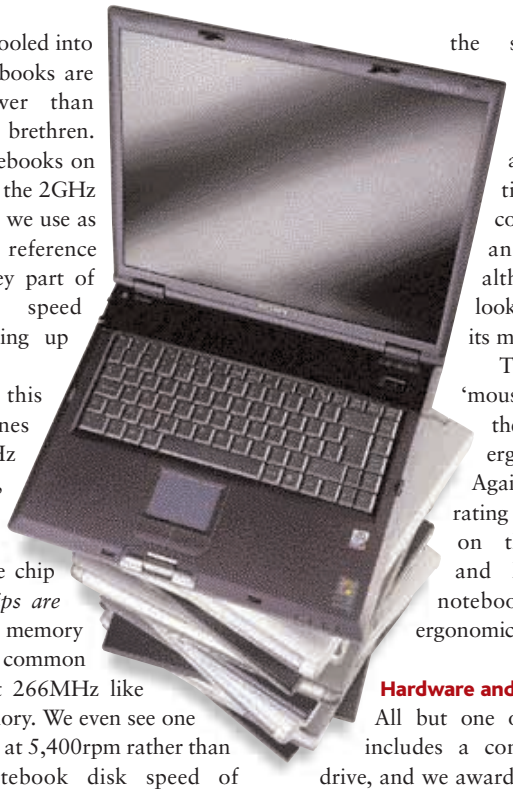


And don't be fooled into thinking that notebooks are significantly slower than their desk-bound brethren. Five of the 13 notebooks on test are faster than the 2GHz Pentium 4 Dell PC we use as our benchmark reference machine. Every key part of the notebook's speed equation is catching up with the desktop.

Two of this month's machines feature a 2.4GHz Pentium 4 CPU, although this remains a desktop rather than mobile chip (*see When the chips are down, p62*). DDR memory is now the most common choice, running at 266MHz like most desktop memory. We even see one hard disk that runs at 5,400rpm rather than the standard notebook disk speed of 4,200rpm.

Even more importantly, the final ingredient has fallen into place: 3D acceleration. For the first time, you can buy a notebook that plays the latest games at respectable frame rates.

With DVD/CD-RW combo drives, 40Gb hard disks and high-resolution, high-quality TFT screens becoming the de facto standard as well, this Labs test of 13 notebooks could prove unlucky for the desktop.

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. These days, a 1,024 x 768 resolution seems too small in a 15in screen; we prefer 1,400 x 1,050 pixels due to the extra space it gives you on the Desktop. Sony goes one step further, with its 16.1in screen offering a massive 1,600 x 1,200 working area.

We also give each TFT a rating for quality, which incorporates the evenness of its backlighting, its response times (vital for games and playing back DVDs), its viewing angles and its contrast. Most TFTs here use the same technology, but Dell's screen was particularly noticeable for its amazing response times and vivid colours. Dell dubs it an enhanced TFT, although it doesn't look as sharp in 2D as its more standard rivals.

The keyboard and 'mouse' combination is the final part of the ergonomics equation. Again, we give these a rating – this time based on the feel, position and layout. For each notebook's at-a-glance ergonomics score, see p56.

Hardware and software

All but one of these notebooks includes a combo DVD/CD-RW drive, and we award points for speed of writing and re-writing. Only AJP opts for separate DVD and CD-RW drives, which allows direct copying of CDs and more. Obviously, it scores extra for this added flexibility.

As you'd expect, the larger the hard disk the more points a machine receives. Likewise, extras like Wireless LAN count towards each machine's hardware score, as do the variety and number of ports.

For software, we take account of both the operating system used (Windows XP Professional scores more than XP Home due to its more advanced features) and any software 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 look for any potential weaknesses in the design. Style is a 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 desktop-replacement 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 the office and on those occasions when travelling.

The other side of the coin is expandability. Often, 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 as well as any other expansion opportunities, such as adding more memory.

THE AWARDS

We give three awards to manufacturers. The first and 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, inkjet 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 your needs. In certain Labs, we also give a self-explanatory Best Value award.

LABS RATINGS: A BRIEF EXPLANATION

Regular readers will notice that we now rate Labs differently. Instead of star ratings, notebooks are awarded a number relative to 100, where 100 is the average this month. So a performance score of 125 means a notebok was 25 per cent faster than the average this month, 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 value where appropriate, to give an overall score that is again relative to the average.

PC PRO RATINGS
OVERALL
98
FEATURES 92 | PERFORMANCE 97 | VALUE 104
100 IS THE AVERAGE

Warranty

The amount of points each machine receives for the warranty depends on the length of the cover and the type. If, for example, a company offers a collect-and-return warranty, this has obvious advantages over return-to-base, where you must pay for sending the machine back to the vendor. International and European 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 2001, issue 87, p210*).

Battery life and speed

We pushed all 13 machines to the limit for both performance and battery life. See over the page for details of how we put the notebooks through their paces.

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 the following applications: Microsoft Word XP, Excel XP, Access XP, FileMaker Pro 5, Adobe Photoshop 6.01, CorelDRAW 9 Essentials, dBpowerAMP and Cleaner 5.01.

For example, we open 25 high-resolution photographic images in Photoshop, then rotate, colour correct and apply filters as necessary. We then turn some into a poster and a Web page with buttons and hotspots. To simulate an element of real-world multitasking, we play an AVI file in Windows Media Player simultaneously with the Access, FileMaker and dBpowerAMP tests.

Each score is relative to a 2GHz Pentium 4 Dell desktop PC with 256Mb of PC800 RDRAM. 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 93, p56.

3DMARK2001

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. For simplicity, we only print the latter scores here, but both scores are taken into consideration when working out each machine's 3D performance.

BATTERY TESTS

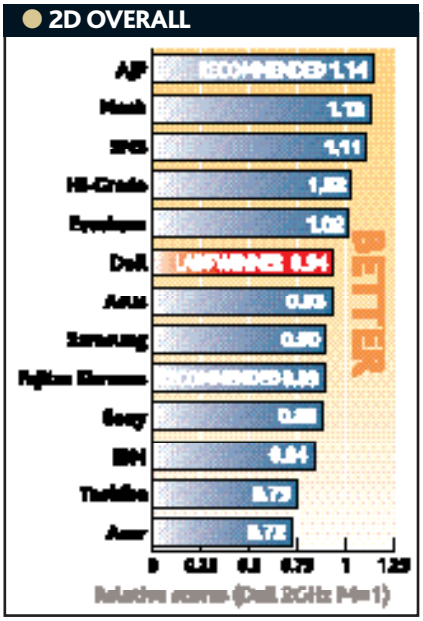
We use three battery tests. The first is our intensive test, where we push the notebook to its maximum using our Excel Business and Word benchmarks. We disable all the notebook's power management features and set the brightness to maximum. This gives us the absolute minimum time a notebook's battery will last.

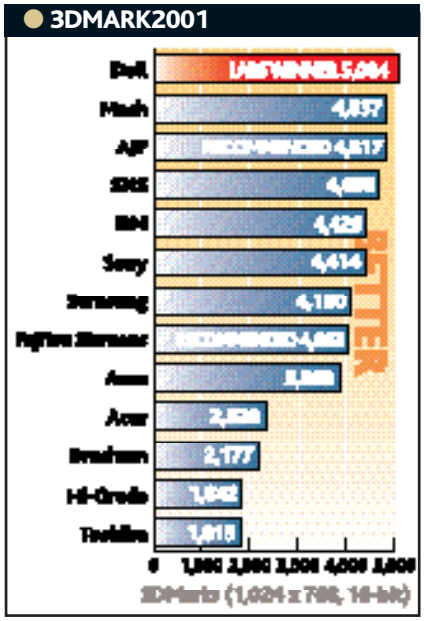
We also force each notebook to repeatedly play back a 30-minute DVD video until the battery gauge drops to 10 per cent. Any lower than this, and most notebooks refuse to play DVDs.

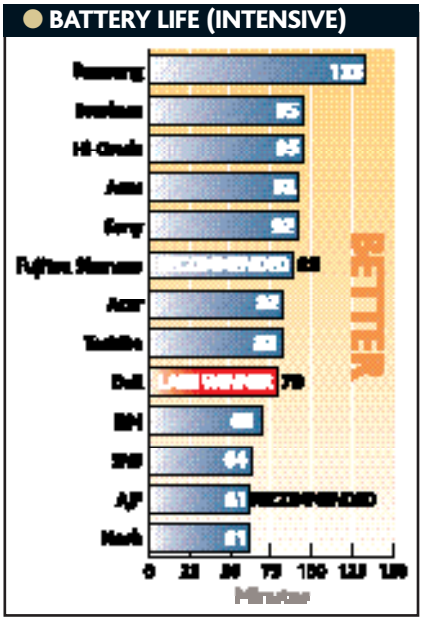
To see the maximum time a notebook will last, we set the brightness to medium and run just a timer in the background; this writes to the hard disk every minute, but otherwise keeps CPU and hard disk demands to a minimum.

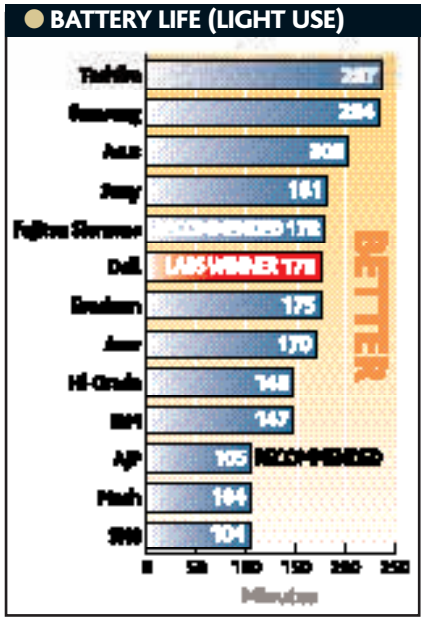
ERGONOMICS

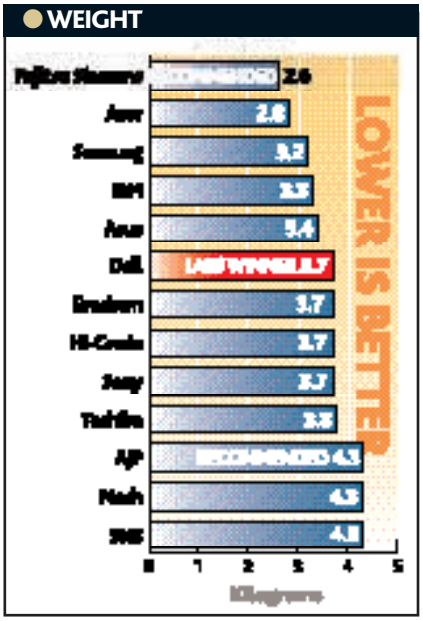
This score takes into account the size and quality of the screen, and the usability of the keyboard and trackpad (or trackpoint). See p55 for more details.

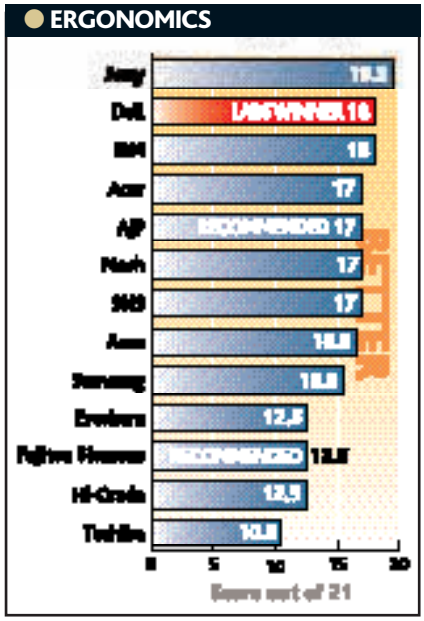












SPECIFICATIONS AND FEATURES

	Acer TravelMate 632LC	AJP 5600P	Asus L3800C	Dell Inspiron 8200	Evesham Voyager 5615 2.2	Fujitsu Siemens Lifebook E-7010
Overall score	90	106	100	108	97	106
Manufacturer's code	91.43U01.FCU	5600P-DVD/CDRW	L3817C-DVDRW	200 i50REV	N/A	N/A
Price* (inc VAT)	£1,599 (£1,879)	£1,625 (£1,909)	£1,500 (£1,763)	£1,749 (£2,055)	£1,369 (£1,609)	£1,446 (£1,699)
Cost of delivery (inc VAT)	Depends on reseller	£29 (£34)	Depends on reseller	£49 (£57)	£34 (£40)	Depends on reseller
Supplier	Acer 0870 900 2237	AJP Computers 020 8208 9777	Landmarq 020 8768 9301	Dell 0870 152 4647	evesham.com 0870 160 9500	Fujitsu Siemens 01344 475555
Supplier's Web site	www.acer.co.uk	www.ajp.co.uk	www.landmarq.co.uk	www.dell.co.uk	www.evesham.com	www.fujitsu-siemens.co.uk
Manufacturer's Web site	www.acer.co.uk	www.ajp.co.uk	www.asus.com	www.dell.co.uk	www.evesham.com	www.fujitsu-siemens.co.uk
Basic warranty**	2yrs RTB (1yr international)	1yr RTB, 1yr RTB labour-only	2yrs RTB	1yr C&R European	2yrs RTB***	3yrs C&R international
Dimensions (W x D x H, mm)	327 x 267 x 38	329 x 289 x 52	328 x 268 x 45	331 x 277 x 48	327 x 276 x 49	308 x 261 x 35
System weight with battery (kg)	2.8	4.3	3.4	3.7	3.7	2.65
CORE COMPONENTS						
Processor type	1.6GHz Intel Pentium 4-M	2.4AGHz Intel Pentium 4	1.7GHz Intel Pentium 4-M	1.8GHz Intel Pentium 4-M	2.2GHz Intel Pentium 4	1.7GHz Intel Pentium 4-M
Mobile/desktop chip	Mobile	Desktop	Mobile	Mobile	Desktop	Mobile
Level 2 cache size	512Kb	512Kb	512Kb	512Kb	512Kb	512Kb
Motherboard chipset	ALi M1671	Intel 845MP	Intel 845MP	Intel 845MP	Intel 845MP	Intel 845MP
RAM fitted	512Mb PC2100	512Mb PC2100	256Mb PC2100	512Mb PC2100	512Mb PC2100	256Mb PC2100
Maximum RAM in current configuration	512Mb	512Mb	768Mb	1Gb	512Mb	768Mb
SODIMM sockets free/total	0/2	0/2	1/1	1/2	0/2	1/1
DISPLAY						
Display size (in)	15	15	15	15	15	14.1
Native resolution	1,400 x 1,050	1,400 x 1,050	1,400 x 1,050	1,600 x 1,200	1,024 x 768	1,024 x 768
Graphics chipset	Nvidia GeForce2 Go 100	ATi Mobility Radeon 7500	ATi Mobility Radeon 7500	Nvidia GeForce4 440 Go	ATi Mobility Radeon M6	ATi Mobility Radeon 7500
Video memory	16Mb	64Mb	32Mb	64Mb	16Mb	32Mb
Extended Desktop support	✔	✔	✔	✔	✔	✔
Other output	TV-out	TV-out	TV-out	TV-out	TV-out	TV-out
DRIVES						
Hard disk (make and model)	IBM Travelstar 40GN	Hitachi DK23DA-40	IBM Travelstar 40GN	IBM Travelstar 60GH	Fujitsu MHR2040AT	Toshiba MK2018GAP
Speed (rpm)	4,200	4,200	4,200	5,400	4,200	4,200
Removable by user	✔	✔	✔	✔	✔	✔
Nominal capacity	30Gb	40Gb	40Gb	60Gb	40Gb	20Gb
Formatted capacity	27.9Gb	37.2Gb	37.1Gb	57Gb	37.2Gb	18.6Gb
Floppy disk drive	Optional (£49)	✔ (removable)	✔ (integrated)	✔ (removable)	✖	✖
Optical drive and speed	Panasonic combo UJDA720 (8x DVD, 8x/8x/24x CD-RW)	MSI SDR-081 DVD-ROM (8x/24x), Panasonic UJDA340 CD-RW (8x/8x/24x)	Toshiba combo SD-R2102 (8x DVD, 8x/4x/24x CD-RW)	Sony combo CRX810E (8x DVD, 16x/10x/24x CD-RW)	Panasonic combo UJDA720 (8x DVD, 8x/8x/24x CD-RW)	Panasonic combo UJDA720 (8x DVD, 8x/8x/24x CD-RW)
Bay options	✖	Combo DVD/CD-RW, battery	✖	CD-ROM, DVD-ROM, CD-RW	DVD-ROM (£80 less)	CD-ROM, DVD-ROM, CD-RW, hard disk, battery
BATTERY						
Battery technology	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion
Capacity of battery (mAH)	4,000	4,000	4,000	4,460	6,000	3,800
Price of replacement battery inc VAT	£85 (£100)	£140 (£165)	£75 (£88)	£79 (£93)	£70 (£82)	Not supplied
COMMUNICATIONS						
Modem (speed)	Lucent Technologies Software Modem AMR (V.90)	SmartLink (V.90)	HSP56 MR (V.90)	Actiontec MD56ORD (V.92)	HSP56 MR-8170 (V.90)	Lucent Technologies Software Modem AMR (V.90)
Network (speed)	Realtek RTL8139 (10/100)	Realtek RTL8139 (10/100)	Realtek RTL8139 (10/100)	3Com 3C920 (10/100)	Realtek RTL8139 (10/100)	Realtek RTL8139 (10/100)
Wireless technologies	✖	✖	✖	✖	✖	Wireless LAN
PORTS						
VGA	1	1	1	1	1	1
PC Card slots	1 Type II	1 Type II	2 Type II	2 Type II	1 Type II	2 Type II
USB 1.1	2	4	2	2	2	2
FireWire (IEEE-1394)	1	1	2	1	1	1
Infrared	1	1	1	1	1	1
Serial	✖	✖	1	1	✖	1
Parallel	1	1	1	1	1	1
PS/2	✖	1	1	1	✖	1
Other ports	Smart card reader	S/PDIF out	✖	S/PDIF out	✖	Infrared mouse connector
Pointing device type	Trackpad	Trackpad	Trackpad	Dual trackpad/trackpoint	Trackpad	Trackpad
Docking station options	Acer EasyPort (£89)	✖	✖	Port replicator (£170)	✖	Port replicator (£69)
OTHER PERIPHERALS						
Sound chipset	ALi Audio Wave	Avance AC97 Audio	Crystal WDM Audio	Crystal WDM Audio	Avance AC97 Audio	Intel integrated
Speakers location	Chin-mounted	Above keyboard	Bottom of chassis	Each side of chassis	Chin-mounted	Chin-mounted
Internal microphone	✔	✔	✔	✔	✔	✔
Carry case supplied	✖	✔	✖	✖	✖	✖
Additional peripherals	Integrated smart card reader, 2 smart cards	✖	Mini USB mouse	✖	✖	Smart card reader (Type II PC Card)
SOFTWARE SUPPLIED						
Operating system	Windows XP Professional	Windows XP Professional	Windows XP Professional	Windows XP Home	Windows XP Home	Windows XP Professional
Recovery/Windows CD provided	Recovery CD	Recovery CD	Recovery CD	Recovery CD	Recovery CD	Recovery CD
Main titles	Norton AntiVirus	✖	Trend Micro PC-cillin 2000, Asus Probe	Office XP SBE	BigFix, B's Recorder GOLD, Sun StarOffice 5.2	DeskView

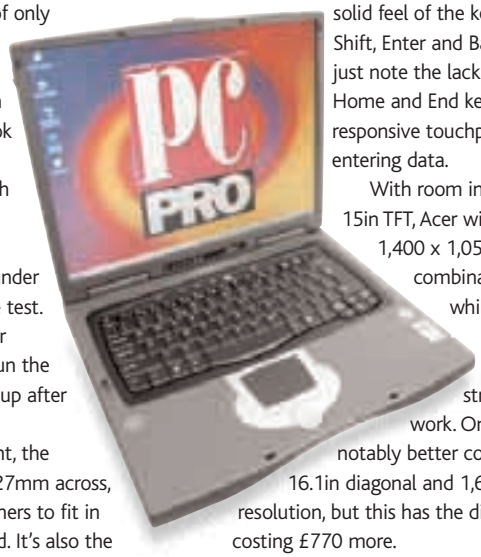
*Prices correct at time of going to press. **Warranty is parts and labour unless otherwise stated. ***Includes accidental damage.

Hi-Grade Ultinote M6500-2200	IBM ThinkPad A31	Mesh Explorer 15.1 2400 Pro	Samsung T10 XVC 1700	SNS Mercury	Sony VAIO PCG-GRX416SP	Toshiba Satellite 1900-102
98	99	102	100	105	98	93
N/A	TV1D5UK	N/A	N/A	N/A	N/A	PS190E-00K48-EN
£1,399 (£1,644)	£2,003 (£2,354)	£1,599 (£1,879)	£1,879 (£2,208)	£1,399 (£1,644)	£2,369 (£2,784)	£1,276 (£1,499)
£29 (£34)	£8 (£9)	£39 (£46)	✖	£25 (£29)	✖	£3 (£4)
Hi-Grade 020 8532 6111	WStore 01252 745000	Mesh Computers 020 8208 4704	dabs.com 0800 138 5182	SNS Computers 0870 748 4111	dabs.com 0800 138 5182	PC World 08000 565732
www.higrade.com	www.wstore.co.uk	www.meshcomputers.com	www.dabs.com	www.snscomputers.co.uk	www.dabs.com	www.pcworld.co.uk
www.higrade.com	www.pc.ibm.com/uk	www.meshcomputers.com	www.samsungelectronics.co.uk	www.snscomputers.co.uk	www.vaio.sony-europe.com	www.toshiba.co.uk
2yrs C&R international***	1yr RTB	2yrs RTB	1yr C&R European	1yr C&R	1yr RTB	1yr RTB international
327 x 280 x 50	328 x 272 x 53	329 x 289 x 52	324 x 273 x 42	329 x 289 x 52	354 x 290 x 45	333 x 292 x 58
3.7	3.3	4.3	3.2	4.3	3.7	3.8
2.2GHz Intel Pentium 4	1.6GHz Intel Pentium 4-M	2.4AGHz Intel Pentium 4	1.7GHz Intel Pentium 4-M	2.2GHz Intel Pentium 4	1.8GHz Intel Pentium 4-M	1.7GHz Intel Pentium 4
Desktop	Mobile	Desktop	Mobile	Desktop	Mobile	Desktop
512Kb	512Kb	512Kb	512Kb	512Kb	512Kb	512Kb
SiS650	Intel 845MP	Intel 845MP	Intel 845MP	Intel 845MP	Intel 845MP	Intel 845MP
512Mb PC2100	256Mb PC2100	512Mb PC2100	256Mb PC2100	512Mb PC2100	512Mb PC2100	256Mb PC2100
512Mb	768Mb	512Mb	768Mb	512Mb	512Mb	768Mb
0/2	1/2	0/2	1/2	0/2	0/2	1/1
15	15	15	15.1	15	16.1	14.1
1,024 x 768	1,400 x 1,050	1,400 x 1,050	1,400 x 1,050	1,400 x 1,050	1,600 x 1,200	1,024 x 768
SiS650	ATi Mobility Radeon 7500	ATi Mobility Radeon 7500	ATi Mobility Radeon 7500	ATi Mobility Radeon 7500	ATi Mobility Radeon 7500	ATi Mobility Radeon M6
32Mb shared	32Mb	64Mb	32Mb	64Mb	32Mb	16Mb
✖	✔	✔	✔	✔	✔	✔
TV-out	TV-out	TV-out	Composite out	TV-out	A/V out	TV-out
Hitachi DK23DA-40	IBM Travelstar 40GN	Hitachi DK23DA-40	Toshiba MK4018GAP	Hitachi DK23DA-40	Toshiba MK4018GAS	IBM Travelstar 40GN
4,200	4,200	4,200	4,200	4,200	4,200	4,200
✔	✔	✔	✔	✖	✔	✔
40Gb	40Gb	40Gb	40Gb	40Gb	40Gb	20Gb
37.2Gb	35.9Gb	37.2Gb	37.2Gb	37.2Gb	37.1Gb	18.6Gb
✔ (USB external)	✖	✔ (removable)	✔ (integrated)	✔ (removable)	✖	✔ (removable)
Panasonic combo UJDA720 (8x DVD, 8x/8x/24x CD-RW)	Panasonic combo UJDA720 (8x DVD, 8x/8x/24x CD-RW)	Toshiba combo SD-R2102 (8x DVD, 8x/4x/24x CD-RW)	Toshiba combo SD-R2102 (8x DVD, 8x/4x/24x CD-RW)	Toshiba combo SD-R2102 (8x DVD, 8x/4x/24x CD-RW)	Sony combo CRX810E (8x DVD/16x/10x/24x CD-RW)	Panasonic combo UJDA720 (8x DVD, 8x/8x/24x CD-RW)
✖	CD-ROM, DVD-ROM, CD-RW, Zip, floppy, hard disk, battery	✖	✖	✖	✖	✖
Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion
6,000	4,000	4,000	Not supplied	4,000	4,000	5,850
£95 (£112)	£100 (£118)	£99 (£116)	£118 (£139)	£75 (£88)	£144 (£169)	Not supplied
HSP56 MR-8575 (V.90)	Agere Systems AC97 Modem (V.90)	SmartLink (V.90)	SENS LT56ADW (V.90)	SmartLink (V.90)	Conexant-Ambit Soft56K (V.90)	Toshiba Software Modem AMR (V.90)
SiS900 (10/100)	Intel PRO/100 VE (10/100)	Realtek RTL8139 (10/100)	Intel PRO/100 VE (10/100)	Realtek RTL8139 (10/100)	Intel PRO/100 VE (10/100)	Intel PRO/100 VE (10/100)
✖	High Rate Wireless LAN	✖	ORiNOCO Wireless LAN	✖	✖	✖
1	1	1	1	1	1	1
1 Type II	2 Type II	1 Type II	2 Type II	1 Type II	2 Type II	2 Type II
4	2	4	2	4	3	3
1	✖	1	1	1	1	✖
1	✖	1	✖	1	✖	1
✖	✖	✖	✖	✖	✖	✖
1	1	1	1	1	1	1
✖	✖	1	1	1	✖	✖
✖	Ultrabay 2000/Ultrabay Plus	S/PDIF out	S/PDIF out	S/PDIF out	Memory Stick slot	✖
Trackpad	Trackpoint	Trackpad	Trackpad	Trackpad	Trackpad	Trackpad
USB port replicator (£60)	USB hub (£73)	Port replicator (£99)	MiniDock III (£169)	✖	Port replicator (£119)	✖
Avance AC97 Audio	SoundMAX Digital Audio	Avance AC97 Audio	ESS Maestro3	Avance AC97 Audio	Yamaha AC-SG	Crystal WDM Audio
Chin-mounted	Chin-mounted	Above keyboard	Palm rest	Above keyboard	Above keyboard	Below screen
✔	✖	✔	✔	✔	✖	✖
✔	✖	✔	✖	✔	✖	✖
✖	✖	✖	Fingerprint sensor	✖	Weight saver	✖
Windows XP Home	Windows XP Professional	Windows XP Home	Windows 2000 or XP Professional	Windows XP Professional	Windows XP Professional	Windows XP Home
Recovery CD	Recovery CD	Recovery CD	Windows CD	Windows CD	Recovery CD	Recovery CD
Microsoft Works Suite 2002, McAfee Anti-Virus	MGI VideoWave 4, Lotus SmartSuite Millennium 9 (licence)	Lotus SmartSuite Millennium 9	MGI VideoWave 4 MGI PhotoSuite 3, Norton AntiVirus 2002	✖	Adobe Photoshop Elements, Premiere 6 LE, DVgate suite, Norton AntiVirus 2002, PictureGear5.1, PictureToy 1.1	Microsoft Works Suite 2002, Sophos Anti-Virus 3.56

Acer TravelMate 632LC

PRICE £1,599 (£1,879 inc VAT) SUPPLIER Acer 0870 900 2237

VERDICT **An extremely portable desktop replacement that boasts plenty of features, including smart card security. Only the price needs to change.**



The TravelMate is one of only two notebooks in this Labs weighing under 3kg, making it – along with the Fujitsu Siemens Lifebook – one of the most travel-friendly solutions. They both boast solid, albeit not stunning, battery life – the TravelMate lasted for just under three hours in our light-use test. It was less impressive in our intensive tests, where we run the processor at full tilt, giving up after just 82 minutes.

Despite the light weight, the 632LC measures a hefty 327mm across, which allowed Acer's designers to fit in a generously sized keyboard. It's also the most unusual here, with an upward curve at either side. This is meant to make typing more natural, and it doesn't take too long to get used to. But this keyboard's real strengths are the solid feel of the keys and the large Shift, Enter and Backspace buttons; just note the lack of dedicated Home and End keys. The large and responsive touchpad also helps when entering data.

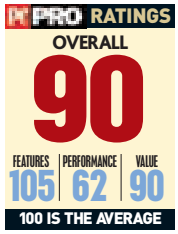
With room in the chassis for a 15in TFT, Acer wisely opts for a 1,400 x 1,050 resolution. This combination works well, while the even and bright backlight ensures you won't struggle to see your work. Only Sony offers a notably better combination with its 16.1in diagonal and 1,600 x 1,200 resolution, but this has the disadvantage of costing £770 more.

The magnesium alloy lid makes sure the screen is protected from bashes if you do take the 632LC on your travels. It's just a shame Acer isn't generous enough to bundle a carry case.

We were also slightly disappointed by the TravelMate's performance in our tests. Despite a 1.6GHz Pentium 4-M processor and 512Mb of DDR memory, it could only manage 0.72 in our 2D benchmarks. Nvidia's GeForce2 Go 100 takes care of graphics. This is now starting to look dated compared to the Radeon 7500 and GeForce4 440 Go and, surprisingly, couldn't cope with 3DMark2001 in 32-bit colour. Even when we dropped the settings down to 16-bit, it only managed a score of 2,328.

The 632LC pulls back plenty of kudos with its features, though. To accompany the usual inclusions of a combo DVD/CD-RW drive and 30Gb hard disk, Acer integrates a smart card reader above the single Type II PC Card slot. Unlike the similarly equipped Lifebook, Acer includes two smart cards as standard. This extra layer of security shouldn't be ignored if you want to protect access to your data.

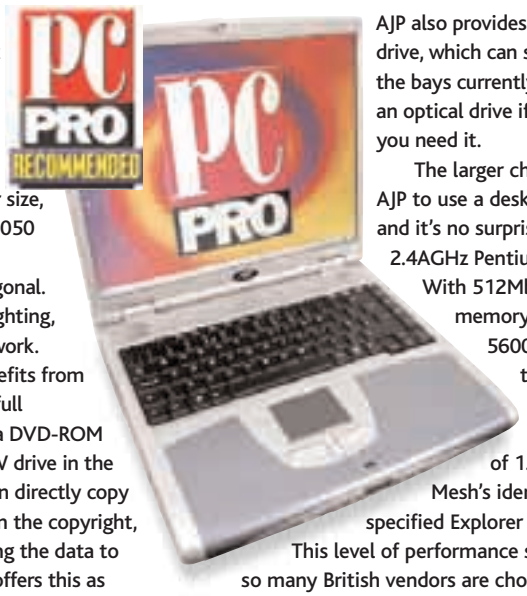
The problem for Acer is that Fujitsu Siemens has put together a more aggressively priced package with similar features, and where the TravelMate has a higher screen resolution the Lifebook boasts Wireless LAN. Unless you can find the TravelMate for under £1,500, our business notebook of choice is the Lifebook.



AJP 5600P

PRICE £1,625 (£1,909 inc VAT) SUPPLIER AJP Computers 020 8208 9777

VERDICT **The only machine on test to offer two optical drives in the same chassis, the 5600P was also one of the best performers in both 2D and 3D.**



AJP gives us our first glance at the latest chassis from Taiwanese manufacturer Clevo, and highly impressive it is too – not only in terms of its sheer size, but also in the 1,400 x 1,050 screen, which is an ideal resolution for a 15in diagonal. With strong, even backlighting, it's a fine choice for 2D work.

The chassis also benefits from two bays, and AJP takes full advantage by supplying a DVD-ROM drive in one and a CD-RW drive in the other. This means you can directly copy a CD – providing you own the copyright, of course – without saving the data to hard disk first. Only AJP offers this as standard in this month's Labs, although notebooks like the Dell Inspiron 8200 and IBM ThinkPad A31 offer this option via extra bays.

AJP also provides a floppy drive, which can slip into one of the bays currently occupied by an optical drive if and when you need it.

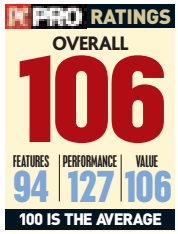
The larger chassis allows AJP to use a desktop processor, and it's no surprise to see a 2.4AGHz Pentium 4 in place. With 512Mb of DDR memory as well, the 5600P rampaged through our benchmarks with a score of 1.14, beating Mesh's identically specified Explorer by a whisker.

This level of performance shows why so many British vendors are choosing the desktop version of the Pentium 4, despite Intel's protestations (*see When the chips are down, p62*).

With ATi's Radeon 7500 graphics chipset in place, the 5600P is a great performer in 3D too: it scored 4,817 in 3DMark2001 when we dropped the colour depth to 16-bit. This placed it just behind Dell's Inspiron 8200, powered by the GeForce4 440 Go, and both machines will cope easily with games over the next few months. The area where the 8200 wins out is the screen, with faster response times and more vivid colours, but the 5600P is still good enough.

We don't recommend using the 5600P for watching DVD movies, as the fan – most notably on the power supply – is too annoying, while its battery life isn't long enough at 61 minutes. At the most, you can expect just over 100 minutes' life from this machine, so you'll have to keep the PSU to hand if you're travelling. Also bear in mind that the 5600P weighs a hefty 4.3kg and the PSU 750g.

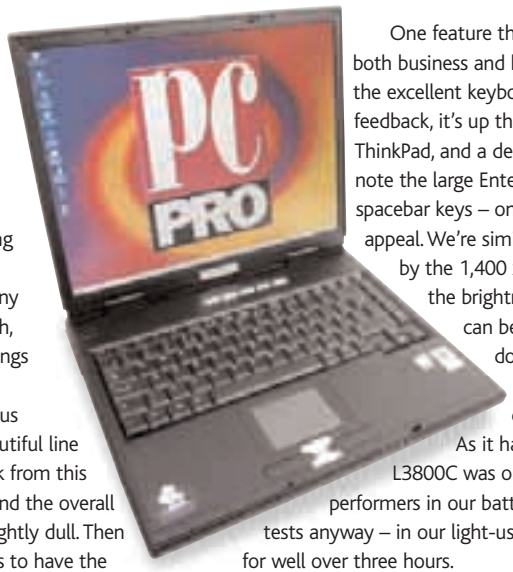
But this machine isn't built for travel. It's meant to sit on a desk and stay there. It's also designed to offer great value for money, and there's no disputing this claim. When you look at the stunning performance, comprehensive features and reasonable price, it's easy to see why we recommend the 5600P.



Asus L3800C

PRICE £1,500 (£1,763 inc VAT) SUPPLIER Landmarq 020 8768 9301

VERDICT **This well-built and well-designed notebook packs in almost all the features a professional user could want. The only question mark hangs over its price.**



Asus' notebooks have already won awards in *PC Pro*, but always under the banner of Asus/Hi-Grade. Now the Taiwanese giant, best known in the UK for its motherboards, is striking out on its own. Although the L3800C doesn't win any awards from us this month, it's a promising sign of things to come.

In terms of design, Asus follows IBM's black-is-beautiful line of thinking. The only break from this is a few flashes of silver, and the overall effect is professional, if slightly dull. Then again, the L3800C appears to have the professional market in its sights, with Windows XP Professional rather than Home the OS of choice. The only surprise is that it doesn't include Wireless LAN.

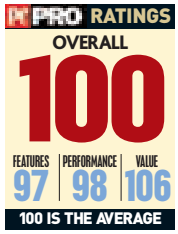
One feature that will attract both business and home users is the excellent keyboard. In terms of feedback, it's up there with the IBM ThinkPad, and a decent layout – note the large Enter, Shift and spacebar keys – only adds to its appeal. We're similarly impressed by the 1,400 x 1,050 screen, the brightness of which can be reduced right down if you're trying to conserve power. As it happens, the L3800C was one of the best performers in our battery rundown tests anyway – in our light-use tests, it lasted for well over three hours.

Asus can take plenty of plaudits for this machine's 2D speed as well. A tally of 0.93 put it a mere fraction behind Dell's Inspiron 8200. Considering that the L3800C only boasts a 1.7GHz Pentium 4-M processor and 256Mb of DDR RAM (compared with the Inspiron's 1.8GHz chip and 512Mb of RAM) this is quite an achievement.

The Asus' 3D performance was as we expected with ATi's Mobility Radeon 7500 in place. A 3DMark2001 score of 3,893 in 16-bit colour (XGA resolution) reflects an average frame rate of 38.9fps in the benchmark's tests, and shows the L3800C can cope with modern games.

Asus follows the trend with its choice of optical drive, opting for a combo DVD/CD-RW. This is removable, as is the 40Gb IBM hard disk, but the floppy drive is integrated into the chassis. With everything in place, the L3800C weighs 3.4kg, but thanks to a relatively slim and compact chassis it's more portable than Dell's Inspiron 8200.

There are some neat finishing touches too. The bundled mini USB mouse is a thoughtful inclusion, a BIOS update application should also prove handy, and the four shortcut buttons are again nice to see. With an estimated street price of £1,500, the L3800C isn't too hard on the wallet either. The only problem for Asus is that some of its rivals, such as Fujitsu Siemens, are being even more aggressive in their pricing.



When the chips are down

Six aggressively priced notebooks use desktop processors, but should you buy them?

There's no disputing the Pentium 4's domination of this Labs – not one of these machines includes an AMD processor. But Intel won't be entirely pleased, as six of the most competitively priced machines use a desktop rather than mobile chip.

What's more, the 2.2GHz and 2.4GHz Pentium 4 processors proved to be substantially faster than even the 1.8GHz Pentium 4-M (the '-M' denotes a mobile processor).

This last fact removes some of the credence from one of Intel's claims about desktop chips in notebooks: that they'll be subject to clock throttling, making the notebook seem slow. Our benchmarks push these processors to the limit, yet we saw no sign of this.

But there's no denying that desktop-powered notebooks run hotter than their rivals, which Intel claims is a huge issue. After all, if you increase the operating temperature of any device, common sense dictates that it won't last as long.

And it's not just the processor that will be affected, but the surrounding electronics (such as the chipset) too. Again, we're yet to see any sign of this, but the real impact could be in a year or two, just when the notebook goes out of warranty.

Then there's size. A desktop chip may be the same size as a mobile one, but the surrounding heatsink and fan array are necessarily larger. That's why sleek machines like the Acer and Asus use mobile chips, while all the desktop users opt for slabs.

Another obvious advantage of mobile chips over their desktop rivals is battery life. Quite apart from a lower core voltage, Pentium 4-M processors boast plenty of other power-saving features over the desktop Pentium 4. One example is the ability to dip in and out of sleep states in a fraction of a second. More obviously, it will drop its speed down significantly on battery power (although you can usually override this if you need maximum performance).

The effect of all these changes is clear enough from our battery tests. Take two notebooks with the same battery capacity of 4,000mAH. The SNS Mercury, boasting a 2.2GHz Pentium 4, lasted for 64 minutes in our intensive tests, while Sony's VAIO kept going for 92 minutes. For DVD playback, the VAIO lasted for 92 minutes again, while the Mercury gave up after 68 minutes.

But we're not suggesting you avoid desktop-powered machines. If performance-per-pound is your priority rather than great battery life, all six offer a compelling solution.

TIM DANTON

Dell Inspiron 8200

PC PRO A LIST

PRICE £1,749 (£2,055 inc VAT) SUPPLIER Dell 0870 152 4647

VERDICT **Ugly, bulky and heavy, but the Inspiron excels where it matters, with great performance in both 2D and 3D and an extraordinary TFT screen.**

If we judged a notebook by its cover, the Inspiron 8200 wouldn't even get opened. This big block of a laptop has changed in appearanc since the 8000 (*see Reviews, issue 75, p16* and it wasn't particul attractive then – it fe every gram of its 3.7k weight, while its large dimensions only add difficulty of carrying Why, then, does it wi Winner award? Becau fortunately for Dell – the inside that count

PC PRO LABS WINNER

On this occasion, that's a 1.8GHz Pentium 4-M processor matched with 512Mb of PC2100 memory. It's no surprise that the Inspiron breezed through

ch a score of 0.94. at little bit w 5,400rpm hard 60GH, and Dell is o include the

nt with the er. The Inspiron is book in the Labs Nvidia's new rce4 440 Go PU, and this had the expected fect in 001. The 8200 rts, with a tally of 16-bit and 32-bit

ke note of this notebook's screen. Dell dubs it an 'enhanced' TFT, and its advantages include vivid colours, extremely quick response times and great viewing angles. Not only do games look great, but DVD movies are equally vivid. The disadvantage is a slightly blotchy effect that's noticeable in single-colour backgrounds. Unfortunately, Dell hasn't attempted to improve the speaker quality with the 8200, so a pair of stereo speakers might prove a handy addition.

But good looks and good sound are all this notebook lacks. With a fixed combo DVD/CD-RW drive and an extra optical drive bay – which can also house the supplied floppy drive, a second battery or even a second hard disk – there's no shortage of expansion options. You can even add another 512Mb SODIMM for a total of 1Gb. Not bad.

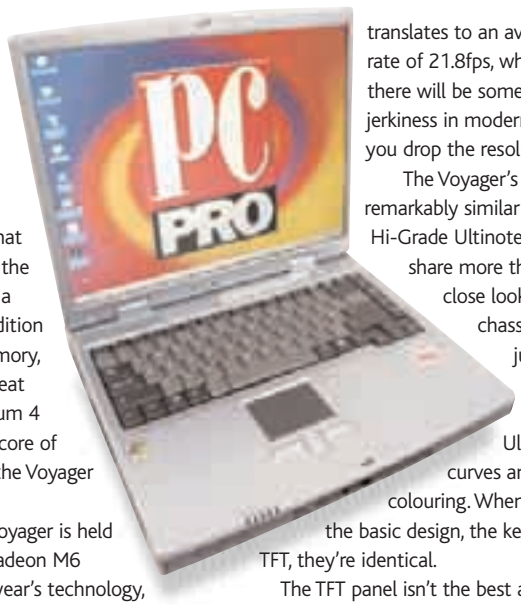
Our only cautionary note is that the collect-and-return warranty, with a target turnaround time of six days, runs out after a year. Also bear in mind that Dell is based in Ireland, if something goes wrong after the first year. We'd be tempted to upgrade the warranty to three years' on-site, next-business-day cover for £199. Do this and the Inspiron packs so much appeal its flaws can be overlooked, especially when Dell bundles Office XP Small Business Edition for the £1,749 price.

PC PRO RATINGS
OVERALL
108
FEATURES 114 | PERFORMANCE 116 | VALUE 104
100 IS THE AVERAGE

Evesham Voyager 5615 2.2

PRICE £1,369 (£1,609 inc VAT) SUPPLIER evesham.com 0870 160 9500

VERDICT **Although evesham.com packs in lots of hardware for the price, the Voyager lacks the finishing touches necessary to win an award.**



Evesham.com – like every other British vendor in this Labs – has opted for the desktop chip route rather than choosing Intel's dedicated mobile Pentium 4-M processor, which means that it comfortably dips under the £1,400 mark yet includes a 2.2GHz chip. With the addition of 512Mb of PC2100 memory, it was no shock when it beat our reference 2GHz Pentium 4 desktop machine with a score of 1.02. It's safe to say that the Voyager flies along in 2D.

In 3D, however, the Voyager is held back by its ATi Mobility Radeon M6 graphics. This is now last year's technology, but even with last year's 3D benchmark – 3DMark2001 – it failed to impress. Its best score of 2,177 (XGA resolution, 16-bit colour) translates to an average frame rate of 21.8fps, which means there will be some obvious jerkiness in modern games unless you drop the resolution.

The Voyager's scores are remarkably similar to the Hi-Grade Ultinote's, and the two share more than this – a close look at their chassis reveals just cosmetic differences such as the Ultinote's added curves and copper colouring. When it comes to the basic design, the keyboard and the TFT, they're identical.

The TFT panel isn't the best around, unfortunately. Although it's well lit, a slight lack of contrast means that light greys look white, so, for example, the bottom taskbar in Word blends into the white of the document. Of course, this isn't a disaster, but it's compounded by a relatively low native resolution of 1,024 x 768. In this desktop replacement Labs, we'd hope for higher.

The keyboard also falls short of the best on test. Although it has a nice feel, it's not as firmly seated as it should be – this is particularly noticeable at the extremes of the keyboard where there's a distinct buckle effect when you press down hard. In the Voyager's favour are a responsive touchpad and five shortcut buttons above the keyboard, perfect for instantly launching your favourite apps.

The Voyager also boasts its fair share of ports, with FireWire, two USB, infrared and a parallel port scattered around. The only obvious omissions are legacy PS/2 and serial ports, but few people will miss the latter.

Evesham.com adds its usual finishing touches of BigFix, StarOffice 5.2 and a good warranty – in this case, two years' return-to-base with accidental damage thrown in. But it's just not enough to win an award. As with Hi-Grade's Ultinote, the lack of 3D acceleration matched with its 1,024 x 768 resolution let it down in this highly competitive Labs.

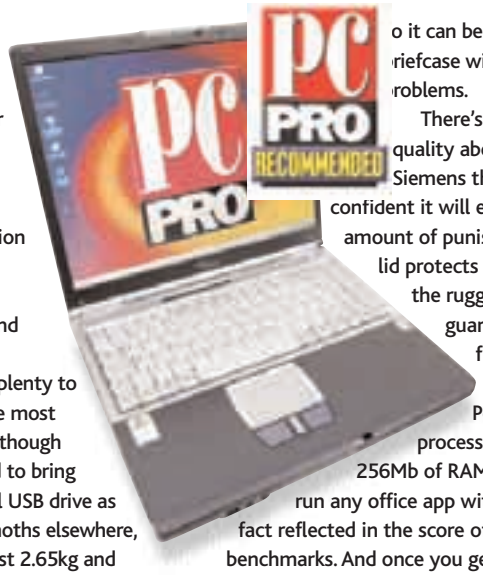
PC PRO RATINGS
OVERALL
97
FEATURES 91 | PERFORMANCE 91 | VALUE 106
100 IS THE AVERAGE

Fujitsu Siemens Lifebook E-7010

PC PRO A LIST

PRICE £1,446 (£1,699 inc VAT) SUPPLIER Fujitsu Siemens 01344 475555

VERDICT **A host of security features matched by great build quality make the Lifebook our favourite business notebook yet – and it's highly portable too.**



Fujitsu Siemens takes security seriously. Apart from the standard BIOS password or the password needed to access Windows XP Professional, the Lifebook E-7010 boasts PIN protection and a smart card reader (although no cards are bundled). Only Samsung and Acer can rival this.

Security aside, there's plenty to like about the Lifebook. The most obvious is its portability, although floppy disk lovers will need to bring along the optional external USB drive as well. Unlike the 4kg behemoths elsewhere, the E-7010 weighs a modest 2.65kg and measures a svelte 35mm from top to bottom, so it can be slipped into a briefcase without too many problems.

There's also a feeling of quality about the Fujitsu Siemens that makes us confident it will endure a certain amount of punishment. The alloy lid protects the screen, while the rugged plastic chassis guards the hard disk from bashes.

A 1.7GHz Pentium 4-M processor coupled with 256Mb of RAM means it will run any office app with aplomb – a fact reflected in the score of 0.89 in our 2D benchmarks. And once you get the Lifebook home, ATi's Radeon 7500 graphics mean that the current generation of games will run comfortably.

When it came to our battery tests, the Lifebook lasted for 88 minutes under intensive use, although this stretched to three hours under light use. However, if you plan to use this laptop on your lap, beware that it runs hot even when idling away.

Fujitsu Siemens gets the basics of keyboard and screen right without excelling. Touch typists should be more than happy with the layout and the responsive touchpad, while the TFT is among the best here – its only trouble is a cast that makes whites look slightly off-white. It also loses out when it comes to size and resolution – we'd prefer a 15.1in TFT with a 1,400 x 1,050 resolution to this 14.1in XGA panel.

But the Lifebook includes all the other vital features: a combo DVD/CD-RW drive, integrated wireless LAN and a FireWire port. The only disappointment is the 20Gb hard disk.

However, we can't complain about the Lifebook's value. For £1,446, you're buying a notebook that meets all the key criteria for business mobility – performance, build quality and security – and it looks stylish too.

PC PRO RATINGS

OVERALL **106**

FEATURES	PERFORMANCE	VALUE
109	98	118

100 IS THE AVERAGE

Too close for comfort?

We investigate if notebooks can seriously damage your health

If you're planning to dump your desktop, be sure to consider the ergonomic implications. Many people find working with notebooks inherently less comfortable than working with desktops, as the fixed keyboard, screen and touchpad provide a completely different experience than that offered by a desktop.

Working hunched over a notebook in a fixed position for extended periods can cause discomfort in the neck, back and wrists. It appears to be a real problem, substantiated by the concern shown by the Health and Safety Executive. The government organisation associates aspects of notebook use with 'musculoskeletal discomfort'.

A lack of hard evidence means that regulations protecting users are few and far between, but the plethora of companies adapting keyboards and mice to make data input a more comfortable experience shows that ergonomics is becoming a bigger issue. Microsoft's Natural keyboards are split into two distinct sets of keys, angled inward at the top to minimise the stress on users' wrists.

Notebook keyboards can't compete with advanced ergonomic designs.

But notebook design can't afford the luxury of wasted space. If a standard desktop keyboard is regarded as less than ideal ergonomically, the more cramped notebook keyboard is an even worse problem. And with trackpads placed directly below the keys, or trackpoints among them, users will find their hands in a restricted position for long periods.

The position of the screen is also cause for concern. Current thinking suggests that computer displays should be placed 18-30in away from the eyes – a distance difficult to achieve when the screen is tied to the keyboard.

There are, of course, ways to make the notebook experience more comfortable, by effectively turning your laptop into a conventional desktop system. Adding an external mouse is an obvious step, but the addition of a USB keyboard and a monitor is just as simple. These trimmings will allow desk-based notebook users to enjoy the relative comfort of a desktop computer while maintaining portability.

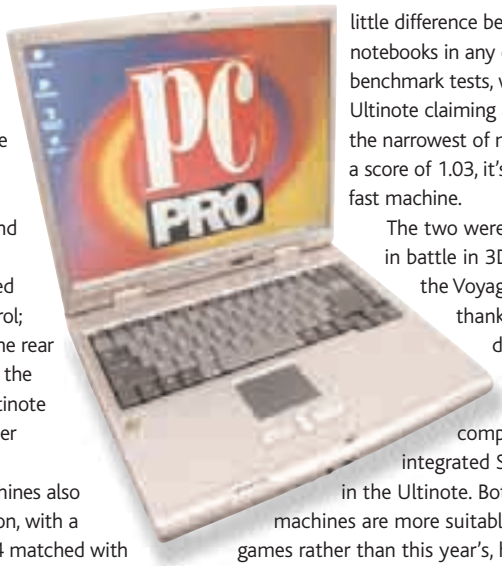
Perhaps the biggest problem stems from ourselves, as we tend to work in the same position for too long. All the same guidelines given to desktop users remain true – don't underestimate the need for a break from typing.

PAUL TROTTER

Hi-Grade Ultinote M6500-2200

PRICE £1,399 (£1,644 inc VAT) SUPPLIER Hi-Grade 020 8532 6111

VERDICT **Good performance in 2D is matched by all the features most people need, but others beat it for 3D acceleration and screen resolution.**



The keen-eyed will notice a distinct similarity between this machine and the Evesham Voyager. There are five shortcut keys above the keyboard; the same headphone, microphone and FireWire sockets are found between the front-mounted speakers and volume control; and every port found on the rear of the Voyager is found on the Hi-Grade, although the Ultinote boasts four USB ports rather than two.

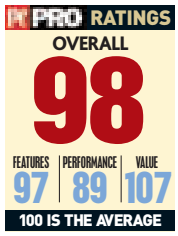
At first sight, the machines also share the same specification, with a 2.2GHz desktop Pentium 4 matched with 512Mb of DDR RAM. Dig slightly deeper, though, and you'll find a SiS650 motherboard chipset here, compared to the Intel 845MP in evesham.com's machine. Despite this, there was little difference between the notebooks in any of our 2D benchmark tests, with the Ultinote claiming a victory by the narrowest of margins. With a score of 1.03, it's undeniably a fast machine.

The two were similarly locked in battle in 3D, but this time the Voyager triumphed, thanks to the dedicated Mobility Radeon M6 chip, compared to the integrated SiS graphics in the Ultinote. Both of these machines are more suitable for last year's games rather than this year's, however.

If you're looking for a notebook to do some serious work on, though, the Ultinote is perfectly capable. The first is the comfortable (albeit not excellent) keyboard – all our comments about the Voyager hold here. The second is the large, well-lit screen, even though we'd prefer a resolution of 1,400 x 1,050 to 1,024 x 768. Naturally, there's a 10/100 Ethernet adaptor to accompany the V.90 modem, but no wireless LAN or Bluetooth.

Then again, the Ultinote isn't designed for workers on the move, with its 3.7kg weight and bulky size. However, just like the Evesham Voyager, it surprised us in our intensive battery rundown benchmarks by lasting for 95 minutes – only Samsung beat this. Under light use it kept going for a less exceptional two hours and 28 minutes. Like all of the desktop-powered notebooks, it also runs slightly warm.

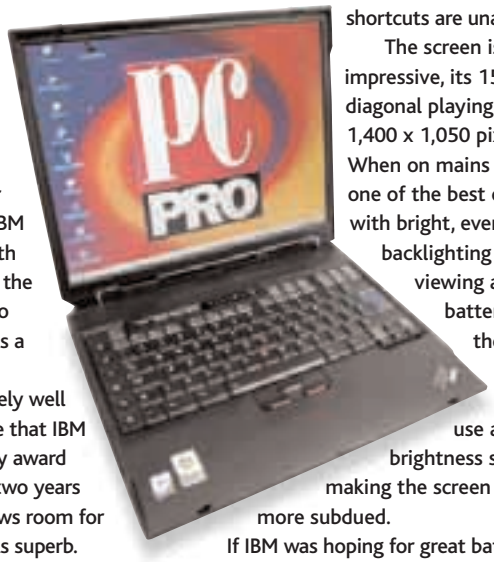
With the near-obligatory combo DVD/CD-RW kept company by a 40Gb hard disk, the Ultinote doesn't lack any obvious features. It's also good to see Works Suite 2002 and a two-year, collect-and-return warranty (which supports accidental damage) included. However, those hoping to network the Ultinote in a business environment should note the use of Windows XP Home rather than Professional. But the biggest problem for Hi-Grade is that others, most notably SNS, offer faster machines with higher-resolution screens at the same price.



IBM ThinkPad A31

PRICE £2,003 (£2,354 inc VAT) SUPPLIER WStore 01252 745000

VERDICT **IBM's traditional great build quality, keyboard and screen are all here, and it held its own in our benchmarks. The only real problem is the price.**



IBM's ThinkPad is one of the most recognised brands in the world, so to a certain extent we can forgive the company for never veering from the black, angular approach that typifies its look, even if it's never going to win a beauty pageant. IBM isn't thinking about sleekness with this particular notebook either – the A31 measures 53mm from top to bottom at its thickest and weighs a hearty 3.3kg.

In return, you get an extremely well built machine; it's no coincidence that IBM has won our Notebook Reliability award (as voted by *PC Pro* readers) for two years running. The extra girth also allows room for a full-width keyboard, which feels superb. Another nice touch is the ThinkLight, which can illuminate the keyboard in dark conditions. The keyboard's only problem is the lack of a Windows key, meaning several handy shortcuts are unavailable.

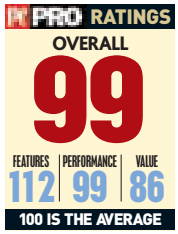
The screen is equally impressive, its 15in diagonal playing host to 1,400 x 1,050 pixels. When on mains power, it's one of the best on show, with bright, even backlighting and good viewing angles. On battery power, though, IBM forces you to use a lower brightness setting, making the screen look more subdued.

If IBM was hoping for great battery life in return, it was wrong. The A31 lasted for a mere 69 minutes in our intensive tests, and only 91 minutes when playing a DVD movie – just long enough to reach the 'so the murderer was...' climax before it cuts out. Even under light use, it couldn't quite reach the two-and-a-half-hour mark.

The ThinkPad didn't stun us with its speed either, although the combination of a 1.6GHz Pentium 4-M processor and 256Mb of RAM was enough for 0.84 in our 2D benchmarks. With the help of ATi's popular Mobility Radeon 7500 graphics chipset, the A31 rustled up 4,428 in 3DMark2001 (XGA resolution, 16-bit colour), so it will cope comfortably enough if you want to use it for games after hours.

This notebook has room for growth too. In this configuration, IBM supplies a combo DVD/CD-RW drive in the right-hand Ultrabay Plus bay, but the left-hand Ultrabay 2000 sits empty. You could add a DVD-ROM drive, second battery or even a second hard disk to complement the 40Gb unit already in place.

With integrated wireless LAN (the antenna for which IBM sensibly positions in the lid for maximum signal quality) and Windows XP Professional as the OS, it's clear the A31 will appeal to the corporate buyer. The only problem is the price. But if you can afford this notebook, its excellent keyboard, expandability and build quality make it worth the extra money.

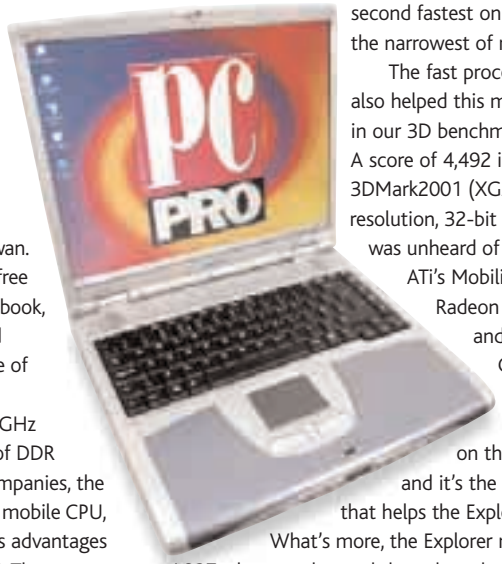


Mesh Explorer 15.1 2400 Pro

PRICE £1,599 (£1,879 inc VAT) SUPPLIER Mesh Computers 020 8208 4704

VERDICT **A notebook on steroids, the 2.4AGHz desktop CPU, ATi Radeon 7500 graphics and 512Mb of RAM make for a powerful, if overly large, laptop.**

Mesh has proven its ability to build great-value PCs time and time again in our Labs, but notebooks are a different proposition altogether. Like all British vendors, it doesn't have the buying power to design its own notebooks and must instead rely on pre-made chassis from Taiwan. However, Mesh does have almost free reign on what goes inside the notebook, and as usual the Brent Cross-based company opts for a careful balance of power, features and value.



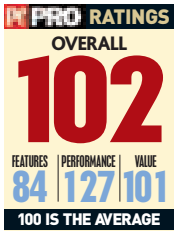
The power stems from a 2.4AGHz Pentium 4 matched with 512Mb of DDR memory. As with all the British companies, the processor is a desktop rather than mobile CPU, which has disadvantages as well as advantages (*see When the chips are down, p62*). The advantages are certainly obvious here: the Explorer blasted its way through our 2D benchmarks with a score of 1.13, making it the second fastest on test by the narrowest of margins.

The fast processor also helped this machine in our 3D benchmarks. A score of 4,492 in 3DMark2001 (XGA resolution, 32-bit colour) was unheard of before ATi's Mobility Radeon 7500 and Nvidia's GeForce4 440 Go arrived on the scene, and it's the former that helps the Explorer here. What's more, the Explorer managed 4,837 when we dropped the colour depth to 16-bit. So, just like the AJP 5600P, SNS Mercury and Dell Inspiron, this notebook will serve even demanding gamers well. Their only problem, of course, is a lack of upgradability when the next generation of games comes along.

The AJP and SNS machines also share the same chassis with the Mesh, and the same plus and minus points. The screen is pretty good, thanks to a 15in diagonal, high brightness levels and a 1,400 x 1,050 resolution. The keyboard is also more than acceptable, with a sensible layout, large keys and nice springy feel. Only IBM's ThinkPad is notably better this month.

Then we come to the flaws. First, the Mesh Explorer isn't the most attractive of beasts, partially thanks to its sheer size. It's also extremely heavy at 4.3kg with the combo DVD/CD-RW and floppy drive in place. Its battery life is poor too, lasting for just 104 minutes even in our light-use tests. And finally, there's the PSU; this weighs 750g and requires an irksome fan to keep it cool.

Where Mesh differs from AJP and SNS is when it comes to the bundled warranty, with two years of cover for both parts and labour, although it's return-to-base rather than collect-and-return. On balance, however, the digital copying ability of the AJP 5600P and the lower price of the SNS Mercury push them both marginally ahead of the Explorer in our ratings.

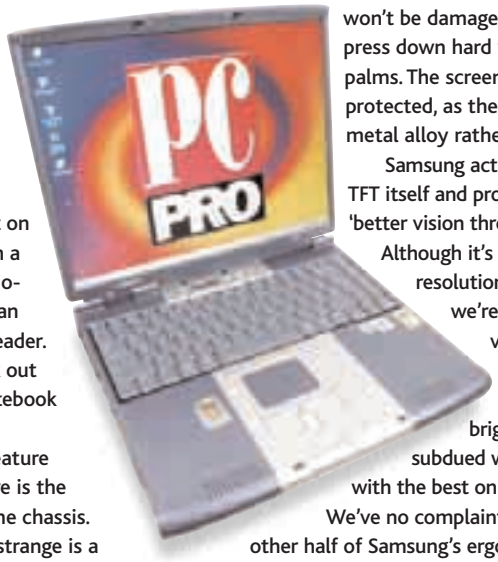


Samsung T10 XVC 1700

PRICE £1,879 (£2,208 inc VAT) SUPPLIER dabs.com 0800 138 5182

VERDICT **A distinctive machine from Samsung, with its fingerprint reader being the most notable feature. It's also fast, particularly in 3D, but the price is too high.**

Samsung is one of the biggest names in electronics, yet its notebooks have yet to make a huge impact on the UK market. The T10 signals its latest assault on the business arena, with a security measure that no-one else here can rival: an integrated fingerprint reader. You can use this to lock out everyone from your notebook in one easy move.



The other design feature that is difficult to ignore is the bubble-look finish on the chassis. Whether it's stylish or strange is a matter of opinion, but it's certainly different. The bubble-ridden palm rests don't feel as sturdy as, say, the ThinkPad's, but the hard disk is kept securely under the keyboard, so won't be damaged even if you press down hard with your palms. The screen is even better protected, as the lid is made from metal alloy rather than plastic.

Samsung actually makes the TFT itself and proudly boasts 'better vision through wise view'. Although it's good to see a resolution of 1,400 x 1,050, we're not so sure. Its viewing angles are nothing special, and even at full brightness it seems subdued when compared with the best on test.

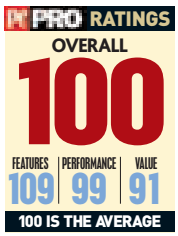
We've no complaints about the other half of Samsung's ergonomic equation – the keyboard is well laid out and offers tactile feedback. The touchpad is similarly responsive, and Samsung includes scroll buttons plus three programmable shortcut buttons above the keyboard.

As supplied, there aren't a huge amount of apps to choose from, but Samsung bundles two potentially useful programs in MGI PhotoSuite 3 and VideoWave 4. The latter is a reflection of the FireWire port at the rear of the machine, while 37.2Gb of hard disk space gives room for a few video projects. Meanwhile, the combo DVD/CD-RW provides a way of burning any creations to CD-R.

You can expect reasonable speed if you do use the XVC 1700 for video editing – it took 742 seconds to compress a 45-second AVI file to MPEG-2. This is largely thanks to the 1.7GHz Pentium 4-M processor, which is backed up by 256Mb of DDR RAM. These helped the T10 to a score of 0.90 in our 2D benchmarks, while the ATi Mobility Radeon 7500 pushed it to 4,100 3DMarks at XGA resolution in 16-bit colour.

Combine this kind of performance with the T10's security features plus integrated wireless LAN and this notebook is a solid solution both for the home and the office. It's also quite portable at 3.2kg.

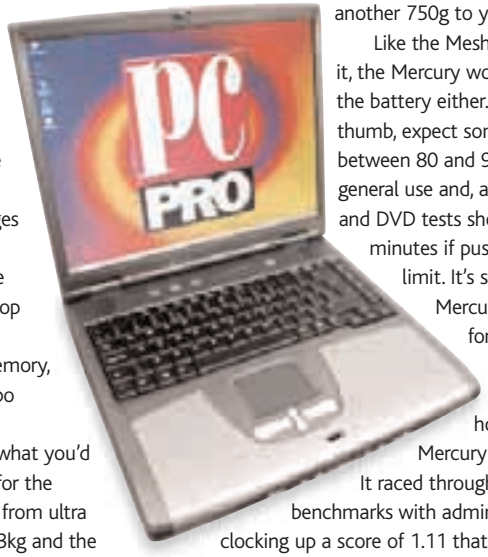
The problem for Samsung is that others this month, notably Fujitsu Siemens, are pricing their notebooks more competitively.



SNS Mercury

PRICE £1,399 (£1,644 inc VAT) SUPPLIER SNS Computers 0870 748 4111

VERDICT **Despite the low price, this notebook doesn't lack for speed and has a decent specification. Only too much weight and too little style count against it.**



SNS may be the third manufacturer to use this chassis – the only physical difference between the Mercury and its brothers from Mesh and AJP being the colour scheme – but the Ilford-based company manages to add something new: a ridiculously low price. Despite only costing £1,399, this laptop includes a 2.2GHz Pentium 4 processor, 512Mb of DDR memory, a 40Gb hard disk and a combo DVD/CD-RW drive.

This isn't far away from what you'd get with a desktop machine for the money, but this chassis is far from ultra portable. With a weight of 4.3kg and the fattest rear end on show (if you include the feet, it measures a hefty 63mm from top to bottom – even if you don't, it's 52mm), you won't be carrying it far. Even the PSU adds another 750g to your baggage.

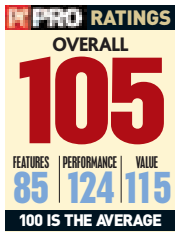
Like the Mesh and AJP before it, the Mercury won't last long on the battery either. As a rule of thumb, expect somewhere between 80 and 90 minutes in general use and, as our intensive and DVD tests showed, around 65 minutes if pushing it to the limit. It's safe to say the Mercury isn't designed for life on the road.

Kept on the desktop, however, the Mercury starts to shine. It raced through our benchmarks with admirable speed, clocking up a score of 1.11 that wasn't far behind the 2.4AGHz Pentium 4-toting AJP and Mesh machines. With ATi's Mobility Radeon 7500 in charge of 3D acceleration, it proved similarly adept in 3DMark2001 – scores of 4,494 and 4,693 in 32-bit and 16-bit colour respectively show that it will even cope with modern games.

The Mercury shares the same screen as AJP and Mesh's offerings, so all our comments there apply here. It's not the very best TFT panel around, but it's well lit and has quick enough response times for games and DVD movies. Possibly its best feature is a high resolution of 1,400 x 1,050 spread across the 15in diagonal. The keyboard gains similar perfectly-good-but-not-the-best plaudits: it's well laid out and has a responsive feel. On the negative side, bear in mind the noisy PSU, which has its fan constantly on in the background.

We should also reiterate some of this chassis' best features. Note the four USB ports, the S/PDIF out and the FireWire port in particular. It's also possible to play CDs with the notebook switched off, although mediocre speaker quality rules the Mercury out as a portable stereo solution.

But, as with its two siblings, it's value for money where the Mercury makes an impact. You're buying a huge amount of notebook (in every sense) for £1,399. And even though it lacks frills and refinement, it's a strong contender if you've only got this much to spend.



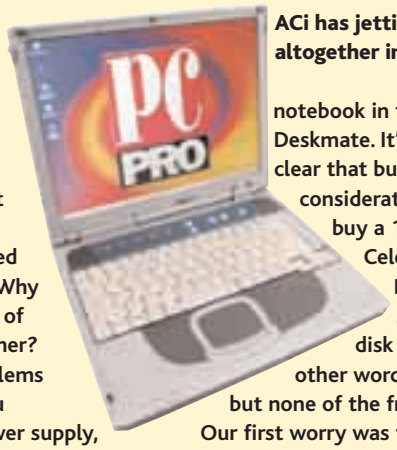
Farewell to batteries

We take a close look at a new phenomenon – the battery-less notebook

Six months ago we started to notice a pattern. A few British manufacturers happened to mention they were investigating a battery-less notebook. They claimed many people weren't actually using the battery, because wherever they worked they were near a plug point. Why not save the cost and weight of integrating a battery altogether?

Of course, there are problems with having no battery. If you accidentally dislodge the power supply, there goes all your data. You'll have to shut down the computer before transporting it from one room to another. And actually working on the move is impossible, unless you buy an optional external battery pack.

But British company ACi has taken the plunge and produced a battery-less notebook in the 2.7kg Deskmate. It's immediately clear that budget is ACi's main consideration. For £699, you buy a 1.1GHz desktop Celeron, 128Mb of RAM, a 14.1in TFT screen, 10Gb hard disk and a CD-ROM. In other words, all the basics but none of the frills.



ACi has jettisoned the battery altogether in its new Deskmate.

Our first worry was that the screen quality would be sacrificed, but thankfully this isn't true. Although its viewing angles are nothing special, it's well lit and has good contrast. The keyboard is also impressive for the money. The only real signs of cutbacks are the cheap-looking plastic mouse buttons.

ACi also provides a generous amount of connectivity, including four USB ports, serial, infrared and parallel ports, plus jacks for the integrated V.90 modem and 10/100 Ethernet adaptor.

Although the Deskmate copes well enough with Windows XP, it's not a fast machine, as its overall score of 0.46 indicates. And with integrated SiS630 graphics, you can forget about 3D games.

But the Deskmate isn't aimed at the demanding user, so we don't mind this lack of power. In fact, our only real complaint is mediocre build quality. Its grey plastic chassis doesn't inspire confidence, so you'd do well to back up all your data on a regular basis.

Where the Deskmate undeniably wins is as a proof of concept. If this is a sign of things to come, there's no reason why battery-less notebooks won't succeed in taking a significant proportion of the budget market.

TIM DANTON

Sony VAIO PCG-GRX416SP

PRICE £2,369 (£2,784 inc VAT) SUPPLIER dabs.com 0800 138 5182

VERDICT **A true desktop replacement, with the massive 16.1in TFT matched by a 1.8GHz processor, 512Mb of RAM and more. Only the high price lets it down.**

Sony has never been a company that does things by halves, so it's no surprise that this top-of-the-range desktop replacement includes virtually every feature under the sun.

Its most stunning inclusion of all is the screen. No humble 14.1in panel with a 1,024 x 768 resolution here. Instead, Sony goes large with a 16.1in diagonal – the biggest we've ever seen in a notebook – and a whopping 1,600 x 1,200 resolution.

And, as we've come to expect from Sony, this is one of the best TFT panels around. It's particularly good for 2D work, thanks to respectable viewing angles, good contrast and sheer brightness. Dell's enhanced TFT takes the plaudits for 3D and DVD playback, but we happily watched movies and played games on the VAIO.

The generously proportioned keyboard benefits from this notebook's enlarged dimensions, and its solid feel is again to the company's credit. Sony complements the responsive touchpad with a variation on its Jog Dial, which provides another way to access settings and programs.

Another Sony-only touch is the Memory Stick slot integrated near the left-side speaker.

Sony conforms to the norm this month when it comes to drives. There's a nippy combo DVD/CD-RW drive that boasts a 16-speed rating for writes, while the 40Gb Toshiba hard disk offers plenty of storage space. Being a VAIO, it's no surprise to see a FireWire port (dubbed i.LINK by Sony) at the notebook's rear, and Sony bundles a generous amount of software for virtually every multimedia activity imaginable.

The familiar Mobility Radeon 7500 graphics chip adds to the VAIO's gaming claims, and a score of 4,414 in 3DMark2001 (16-bit colour, XGA resolution) shows that it's a match for the current crop of games. It's helped along by an Intel 1.8GHz Pentium 4-M processor and 512Mb of RAM, which gave the VAIO a score of 0.88 in our benchmarks – only those notebooks based on desktop Pentium 4 chips were significantly faster.

Not that the VAIO was an amazing performer in our battery tests, as it lasted for just 92 minutes under intensive use. However, the VAIO excels in its sheer quietness; the fan rarely kicks in, which will please any musicians, as will the Yamaha audio chipset.

With so many factors in this machine's favour, we expected the VAIO to challenge for awards, but it has one insurmountable problem: its cost.

This is undoubtedly a great notebook, but Sony's asking price of £2,369 – almost £2,800 including VAT – is simply too much for us to recommend it outright.

PC PRO RATINGS
OVERALL
98
FEATURES 112 | PERFORMANCE 103 | VALUE 75
100 IS THE AVERAGE

Toshiba Satellite 1900-102

PRICE £1,276 (£1,499 inc VAT) SUPPLIER PC World 08000 565732

VERDICT **The use of a desktop chip might put off some, but there's no denying this machine's excellent value compared to other big names.**

Toshiba is one of the few big-name vendors opting for a desktop chip in some of its notebooks, but the reason is obvious enough: value. The Satellite 1900-102 will be sitting next to laptops in high-street stores boasting the same big numbers, yet probably undercutting them by £200 – a simple choice for the buyer unaware of the differences between mobile and desktop chips (*see When the chips are down, p62*).

In the Satellite 1900-102's case, the chip in question is Intel's 1.7GHz Pentium 4, and it's kept company by 256Mb of DDR memory. Unfortunately for Toshiba, this wasn't enough for the Satellite to excel in our demanding benchmarks, with its score of 0.75 some distance behind the 2.4AGHz machines.

Worse was to come in 3DMark2001, with the ATi Mobility Radeon M6 graphics chip only providing enough firepower for a score of 1,813, and that was with the colour depth dropped to 16-bit.

This means you're limited to less demanding games (and you might still have to drop the resolution), but the screen will be able to cope easily enough. It's even better for 2D work, with high brightness levels and vivid colours. Its only problem is the limited resolution – 1,024 x 768 – and that it looks smaller than its 14.1in diagonal size because of the large bezel.

This is one indication of the Satellite's budget orientation, and the same can be said of the keyboard. It doesn't have the tactile feedback we associate with the best Toshiba keyboards, although it's good to see the cursor, Home, End, Pg Up and Pg Dn keys separated out. Quite what the Windows key is doing up in the top-right hand corner is another question.

There are no shortcut keys for quickly launching favourite applications, but Toshiba does provide media playback controls on the front of the machine. These allow you to play CDs when the Satellite is off, and the sound quality is very good for a notebook – just don't expect too much bass response.

The rest of this notebook's features are fairly standard for this month's Labs. There's the ubiquitous combo DVD/CD-RW drive, a 20Gb hard disk and a removable floppy drive. We were also pleased to see Microsoft's Works Suite 2002 in place – this provides Word XP along with several other useful apps.

So should you buy it? Well, despite its size, the Satellite is more stylish than the similarly priced SNS Mercury, but when it comes to specification and speed the latter wins hands down. Then again, if you're looking for a big-name, low-price notebook with all the vital features, pick the Satellite 1900-102.

PC PRO RATINGS
OVERALL
93
FEATURES 92 | PERFORMANCE 68 | VALUE 105
100 IS THE AVERAGE