

# Personal Computer World

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EVER ISSUE

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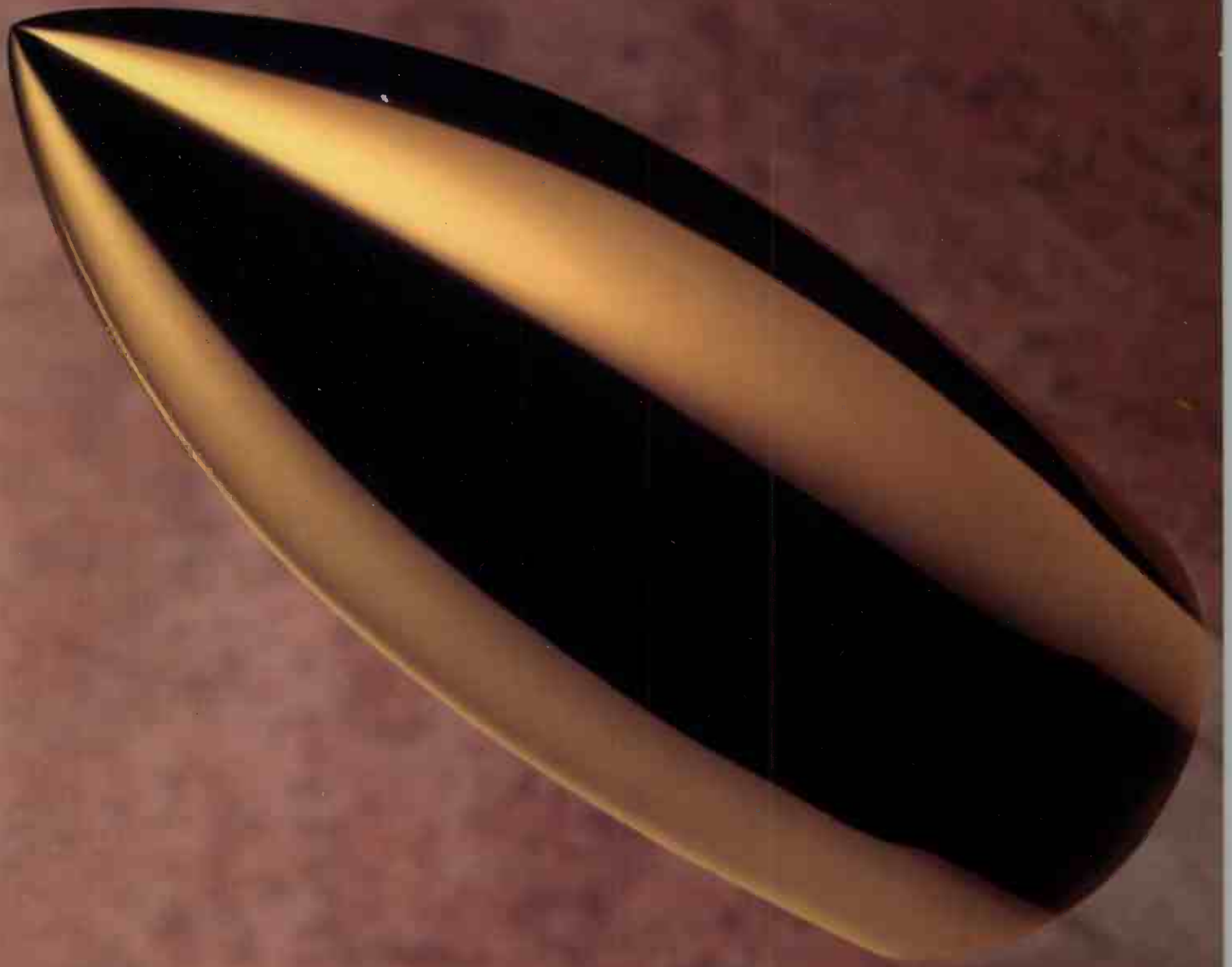
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by TIM FROST

The battle to set the standard for high-density CD, known as Golden Book, commences with proposals from two rival electronics consortiums.

### Interview: Softkey

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Softkey is the second largest software company in the world. We find out why MD Kevin O'Leary thinks he's the "Robin Hood of software".

### Mobile computing

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by SIMON ROCKMAN

Sending data from your mobile phone ought to be easy but it isn't. We explain why, and look at recent developments.

### Tutorial: Procomm Plus for Windows

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by STEPHEN RODDA

The first in a series of articles which guide you through the Procomm Plus scripting language and Internet connection.



### Tektronix Phaser 340

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by SIMON ROCKMAN

The ultimate in colour printing? The new Phaser certainly looks set to stun.

### Hard disk upgrading: Part 2

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by FRANK LEONHARDT

All you need to know about hard disk optimisation, caches, interleaving, and dealing with problem drives.

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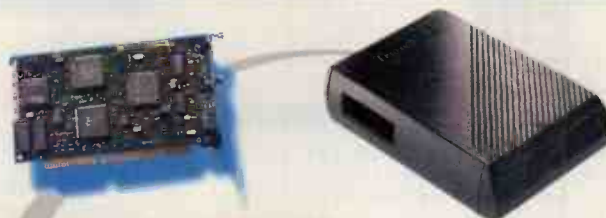


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### PCI Graphics Cards

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PCI graphics cards can really make Windows fly, but how do you choose the one that's right for you? Always quick on the draw, Chris Cain checks out 15 of the latest ranging from £120 to £779.

### Faxmodems

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With a faxmodem in your PC you can fax people straight from your applications, automate laborious mailshots and avoid irritating paper jams. Geoff Marshall looks at 16 of the latest desktop, PCMCIA and pocket products.

### Spreadsheets

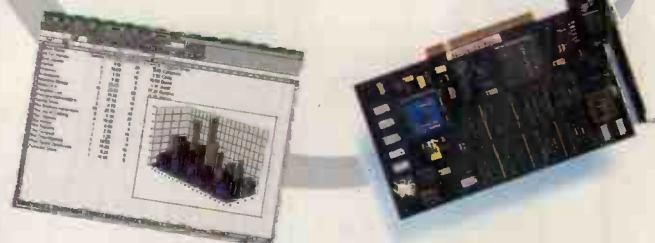
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Has Windows finally put paid to the DOS spreadsheet? Mark Whitehorn rounds up and evaluates the current releases.

### Video Capture Cards

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With multimedia taking off, now is a great time to explore the exciting world of desktop video. Karl Dunkerley directs the action.



# Personal Computer World



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**Editor** Ben Tisdall  
**Associate Editor** Simon Rockman  
**News Editor** Clive Akass  
**Features Editor** David Brake  
**Technical Editor** Karl Dunkerley  
**International Editor** Tim Bjarin  
**Senior Staff Writer** Chris Cain  
**Technical Writer** Gordon Laing  
**Staff Writers** Eleanor Turton-Hill  
 Steven Helstrip  
**Editorial Assistant** Adele Dyer

**Columnists** Nick Beard  
 Barry Fox  
 Michael Hewitt  
 Tim Nott

### Contributors

Tim Anderson • Tim Bjarin • Nick Beard •  
 Paul Begg • Chris Bidmead • JJ Clessa •  
 Simon Collin • Mike Collins • Stephen Cobb •  
 Kevin Dodwell • Tim Frost • Wendy M Grossman •  
 Lester Haines • Cliff Joseph • Frank Leonhardt •  
 Mike Liardet • Paul Magee • Geoff Marshall •  
 Camille Mendler • Mike Mudge •  
 Robin Nixon • Tim Nott • Tim Phillips •  
 Chris Preston • Stephen Rodda • Jack Schofield •  
 Ian Waugh • Stephen Wells • Geof Wheelwright •  
 Mark Whitehorn • Paul Wootton

Editorial Phone **0171 316 9000**  
 Editorial Fax **0171 316 9313**  
 Editorial Email **first\_name.last**  
**name@pcw.cmail.compuserve.com**

## Production

**Production Editor** Lauraine Lee  
**Senior Sub-Editor** Nicky Glatter  
**Sub-Editor** Mark Monahan

## Design

**Art Editor** Darrell Kingsley  
**Designer** Jonathon Mason

## VNU Labs

**Group Editor** John Barnes  
**Labs Editors** Julian Evans & George MacDonald  
**Labs Assistant** Paul Philip  
 Lab Phone **0171 316 9067**  
 Lab Fax **0171 316 9059**

Enquiries or complaints regarding any advertiser in this magazine should, initially, be presented in writing to:  
 Anthony George, 'Customer Relations Department',  
 VNU House,  
 32-34 Broadwick Street, London W1A 2HG.

## Advertising

**Group Ad Manager** Paula Devine **0171 316 9194**  
**Ad Manager** Pranav J Oza **0171 316 9304**  
**Assistant Ad Manager** Kevin Elderfield **0171 316 9303**

### Senior Sales Executives

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**Credit Control Manager** Michael Donlan **0171 316 9701**

**US Sales Representative** Barbara Gough **0101 415 306 0880**

**Taiwan Sales Representatives** Grace Chu/Kent Lai **010-886 2717 7663**

## Production

**Production Controller** Melanie Thomson **0171 316 9481**  
**Production Manager** Adrian Brown **0171 316 9484**  
**Production Assistant** Susie Ross **0171 316 9486**

## Circulation

**Subscriptions Manager** Lelsha Bulley **0171 316 9712**  
**Subscriptions Supervisor** Joanne Nicholls **0171 316 9713**

## Publishing

**Founder** Angelo Zgorelec

**Marketing Manager** Juliet Parker **0171 316 9191**  
**Portfolio Administrator** Kyley Chapman **0171 9316 9183**  
**Publishing Director** Peter Goldstein **0171 316 9000**  
**Publisher** Jon Ross **0171 316 9187**

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It now seems certain that Windows 95 will launch in August, so increasingly the question is switching from "Will it launch?" to "What kind of impact is the launch going to have?"

Upgrading to Windows 95 or buying a machine with Windows 95 on it isn't quite the no-brainer that upgrading from Windows 3.0 to Windows 3.1 was a couple of years ago.

Of course, there is a whole group of PC makers and users who will make the switch immediately. If you're buying a new PC and planning to use it on its own in your home or office the extra features will prove too big a temptation. A lot of SoHo users are also likely to upgrade to Windows 95 (see Letters, "Windows 95? It's simply irresistible", page 329). If they bought their PCs in the last year or so and have at least 8Mb of RAM it won't be a problem.

For the large number of business and corporate PC users, however, it's a trickier decision. Windows 95 is meant to be easier to learn and use than Windows 3.x but it's also completely different. Business and corporate users have to look at training issues, networking and a whole bunch of other stuff before taking the Win95 plunge. They also need to consider whether Windows 95 is the right decision, or if they'd be better off going for OS/2 or even Microsoft's Windows NT.

Dell recently wheeled out its senior vice-presidents and Michael Dell himself, to tell journalists what a big and successful company Dell has become in the last couple of years, and how it has put its disastrous last foray into notebooks behind it and is now doing very nicely, thank you, from its new Latitude notebooks and buoyant sales of its desktop machines. But a notebook briefing from John Medica, an Apple refugee who now heads Dell's notebook business, was completely upstaged by the IBM Butterfly ThinkPad I happened to be using (reviewed page 334). Grown Dell vice-presidents crowded round like Take That fans for a closer look at IBM's state-of-the-art subnotebook.



Ben Tisdall  
Editor

# Next Month PCW AWARDS 1995

PCW reveals this year's winners of the most prestigious IT awards. Plus we announce the ten lucky readers who've scooped either a state-of-the-art Sony MiniDisc data drive or a top-notch Walkman.

## Five go mad with £1,500

What's the best complete system you can get for £1,500?  
See how the PCW staff would spend their money

## Maths Software Group Test

Eric Adler  
figures out  
which package  
equals Editor's  
Choice

## Multimedia on the cheap

20 fully specced  
multimedia  
DX2/66s from  
£949

### June issue

— On Sale Thursday 4th May  
DX2/66MHz desktops —  
budget power  
maths and stats software

### July issue

— On sale Thursday 1st June





# The It's al black and v

What makes the compact BJC-4000 the King of colour printers? Canon's Bubble Jet technology. And with the fast black-only cartridge, it can also deal out high quality, mono copies at up to 4 pages per minute, with an effective resolution of 720 x 360dpi. It'll handle all kinds of paper and transparencies, giving true black and colour on the same page. And its wide range of printer drivers, including advanced Windows™ driver, lets it partner almost any computer.



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The built-in Epson® LQ™ and IBM® Proprinter™ emulations ensure compatibility, whatever game you're playing. No wonder both What PC? and Computer Shopper declared the BJC-4000 to be 'Best Buy.' The BJC-4000 is just one of a whole pack of fine printers. For more information and your local stockist, call Freephone 0500 246246. You'll find it trumps the rest.

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**Canon**  
can.

# PCW Cover Disk

Cover disk editor Robin Nixon introduces this month's offering, which includes a complete and fully working version of GFA-CAD, a superb computer-aided design package, two new Smart utilities from Oakley Software, a challenging arcade game, a powerful program which teaches you memory improvement techniques, and the source code for this month's Hands On Visual Programming column.

## Installing and running the

## PCW Cover Disk

To install the cover disk programs, insert the disk in Drive A: (or B: — whichever you normally use for installing software) and from either DOS or Windows run the file PCW.BAT in the root directory of the floppy disk. Please note that this is a simple DOS installer which can be

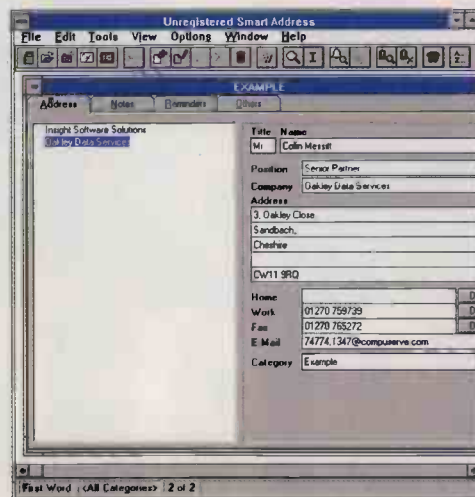
accessed from either DOS or Windows using the cursor keys and return, or a mouse.

### • GFA-CAD

[Minimum Requirements: Windows 3.1]

This is a complete and fully working computer-aided design (CAD) package which previously sold for over £75. However, the publishers have decided to give the whole program away free as they believe

*Below — GFA-CAD is a complete CAD package which would once have cost you £75*



*Left Tired of never having your phone numbers at your fingertips? Smart Address 2.0 could be the answer*

*Below Collect the Bonusoid crystals and battle the enemy in Starmines 2*



you will find it so useful you will want to send off for a copy of the manual.

GFA-CAD is targeted at small-business users, industrial users who want to put together quick designs before porting them across to more complex CAD development systems, trade schools and apprentice shops teaching general CAD systems, and students of technical subjects.

To get you started, the user

interface is composed of three functional areas: the work area, where drawings are created and displayed; two icon bars from where you invoke various drawing functions; and the menu bar, for invoking menus for further program functions.

Before you begin a drawing you need to set the necessary working parameters by selecting the Preset option from the menu bar, followed by Scale,





and then choose the scale you wish to use. To set other parameters such as the display parameters, select Preset followed by Drawing. When you have finished setting up, select File followed by Save Presets.

To create a drawing, decide which tools to use and then draw. For example, to create a line, select Line on the menu bar followed by the option Line, and then press F11 to call up the pop-up menu. From here you can specify the type of line to use, and you are now ready to draw.

For further details on using GFA-CAD, you should refer to the comprehensive built-in help system or send off for the 300+ page manual which is available from GFA for only £10.00 plus £2.50 postage, while stocks last. Contact GFA DATA MEDIA UK at: Unit 4, Bentley Industrial Centre, Bentley, Farnham, Surrey GU10 5NJ. Tel: 01420 22707; Fax: 01420 22807.

#### • Smart Address 2.0

[Oakley Software — Minimum Requirements: Windows 3.1] This is the latest release of the superb address database from Oakley Software.

Smart Address has been designed as an easy to use and convenient telephone and address book for your Windows desktop.

The program supports multiple address books open at any one time, with each address book being displayed in its own Window.

Its features include: note keeping with every entry; entry grouping into user definable categories; nearly all

#### Ancient-Greek memory techniques brought up to date in Total Recall

aspects of Smart Address are customisable by the user; date association with entries; exporting and importing entries to and from text files, and much more besides.

Full details are in the built-in help file.

#### • Smart 'n Sticky

[Oakley Software — Minimum Requirements: Windows 3.1]

This is a brand new labelling program for Windows from Oakley Software, offering full OLE client support and giving you the power of packages such as CorelDraw, Microsoft Word-Art and many more.

The program is easy to use and features Undo, Mark & Revert, Bitmaps, Metafiles, TrueType with rotation & justification, Colour Graphics, Serial Numbers, Date & Time Fields, importing from ASCII & DBF files, and much more.

It also includes a wide range of predefined labels — full details are in the built-in help file.

#### • Starmines 2 — The Planet of Mines

[Jari Karjala — Minimum Requirements: Fast 286 system, 300kb free RAM, a 100 percent register compatible VGA card (The program uses an undocumented 256 colour, 320 x 240 pixel mode and a split-screen display), Sound-Blaster (optional)]

This is an excellent, smoothly scrolling arcade game set in deep space. In it you must fly your ship through the mazes

### Important details

If you have problems with the cover disk such as receiving a "Cannot read from drive A:" error, send the disk with a stamped addressed envelope to TIB PLC (PCW), TIB House, 11 Edward Street, Bradford BD4 7BH.

However, you should note that if a phone number is shown for the publisher of any cover disk program then it will probably be quicker for you to call them first as they will be able to provide direct assistance on their own programs more quickly than might otherwise be possible. Alternatively, you can ring our hot-line on weekdays between 10.30 and 12.30 on 01274 736990.

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If you have received the cover disk but would prefer the CD-ROM, please write to: KP Mailing, Block D, Unit 15, Barwell Business Park, Leatherhead Road, Chessington, Surrey KT9 2NY, enclosing a cheque or PO for 80p made payable to VNU Business Publications Ltd, to cover post and packing. Please allow up to 14 days for the receipt of your CD-ROM.

Alternatively, why not subscribe and save money at the same time? See pages 290-291 for details.

of the Planet of Mines, collecting all the Bonusoid crystals.

You start with your small scout ship at level 1 of the Planet of Mines, and can advance levels by flying through transportals. But you must try to collect as many Bonusoids as possible, while avoiding or shooting the alien objects. Good luck!

#### • Total Recall

[Sharp Software — Minimum Requirements: DOS 3.2, 512kb RAM]

The aim of Total Recall is to teach you how to improve your memory. In it you will be introduced to several well proven memory training techniques, and shown how to make the most of them.

By the time you have completed the Total Recall course, you should be able to memorise any new piece of information you want to quickly and easily, and perform memory stunts that will amaze your friends and colleagues.

Total Recall aims to present information to you in a clear, concise form. Where possible

the lessons have been made interactive, for you to test your progress as you work through the course.

The techniques you will learn from this course have been known since the ancient Greeks and have proved exceptionally effective by almost everyone who tries them. Try it for yourself — we think you'll surprise yourself. And please remember, if you find this course useful and continue to use it, please register with the author. You'll recoup the £11.75 fee many times over if you continue to use the techniques you learn.

#### Hands On Low Level

[Mike Liardet — Minimum requirements: Visual Basic, Windows 3.1]

These are the two files REG.FRM and REG.MAK from this month's column on page 630.

#### Mac software

We will try to bring you an extra-large selection of Mac software in next month's PCW.

# PCW Interactive CD-ROM

**CD-ROM editor Robin Nixon introduces the 600Mb+ of software, demos, animations, videos, music, hi-fi audio tracks and much more on this month's CD-ROM.**

## Installing and running PCW Interactive

[Minimum requirements: 4Mb free RAM (swapfile acceptable), 386SX/33 processor, Windows 3.1. (Users with less than this should at least be able to run the DOS programs on the CD-ROM using the batch file DOSMENU.BAT.) Recommended: 8Mb installed RAM, 486DX/50 processor, Windows 3.11] To run PCW Interactive you no longer need to install any part of it to your PC (other than

Video for Windows if you wish to view the movies). All you need to do is select your CD-ROM drive and run the file PCWI.EXE in the root directory for PCWI to run.

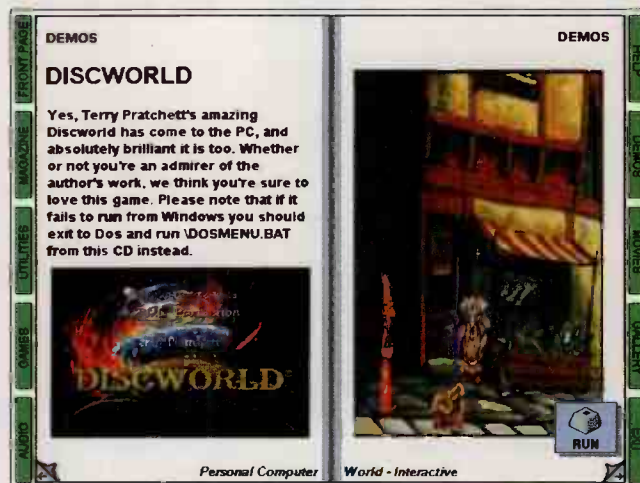
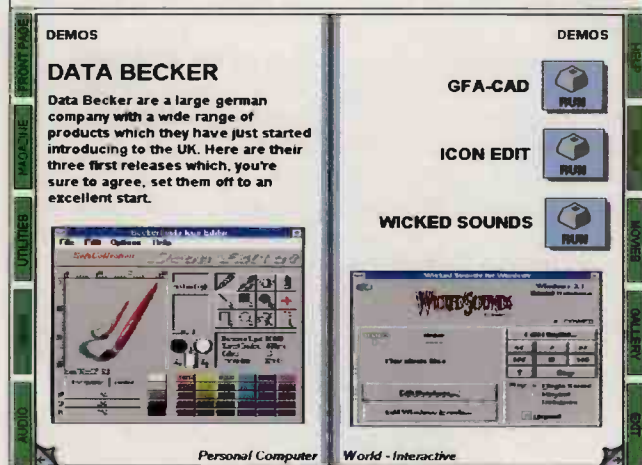
### • Using the CD-ROM from DOS

If you don't have Windows, or experience any problems running some of the DOS software from Windows, you can run the batch file \DOSMENU.BAT from DOS, but don't try running it from a Windows DOS prompt. It will then display a menu from which you can select any of the DOS programs and run them, using either the cursor keys and Return, or a mouse.

### • Using PCW Interactive

The magazine has been designed to look and feel like you're reading a printed publication. For example, at the

*Three of the latest exciting releases from German company Data Becker*



bottom left and right of each page you'll find a Page Turn icon for turning backwards or forwards a page. In addition, there's a set of 10 tabs which appear down the left- and righthand side of each page. Clicking on any of these will take you directly to the page in the magazine where the indicated magazine section begins.

### • Video for Windows

On page 1 you'll have the opportunity to install the latest version of Video for Windows,

*Top Draw Plus, Serif's follow-up to Page Plus Above Terry Pratchett's Discworld for PC*

so that you can view the digital movies on the CD. If you haven't installed Video for Windows from a PCW Interactive CD before, then you *must* install this new version. If you don't, some videos will display the message "Cannot display this video", or similar.

We strongly recommend you install this every time you use a new issue of PCWI as



we always try to ensure the very latest programs and drivers are on the CD-ROM.

Throughout PCW Interactive you'll have the opportunity to run or install programs, get further details on a particular program, try out demonstrations of programs, play videos, listen to audio files and much more. When any of these options is available an icon will be displayed indicating the fact. All you need to do is click once on it to activate the choice.

### • Getting help

Detailed help on most of the programs is available when you run them. For further

details on using the magazine, click on the Help side tab at the top right of any page.

### • Troubleshooting

#### • The videos are jerky

If you have a single-speed CD-ROM drive, consider upgrading to a double-speed or faster drive. You could also try selecting Control Panel | Drivers | Video for Windows. Then uncheck the "Skip frames if behind" entry. We would also suggest that seeing as the very latest version of Video for Windows is on this month's disc, you should install it over your old copy in order to gain higher quality playback with less jerkiness.

## CD-ROM advice & contacts

The PCW CD-ROM is virus checked at every stage of production. However, neither VNU nor PCW can be deemed liable for any problems arising from its use. You are advised not to install software on a networked PC before checking the disc.

For technical support on the CD and the programs on it, call Advice by Telephone on 01708 641454, or email them at [PCWCE@MFL.ORG](mailto:PCWCE@MFL.ORG).

To give feedback on PCW CD-ROMs or cover disks you can email Robin Nixon at either: [rnixon@cix.compulink.co.uk](mailto:rnixon@cix.compulink.co.uk) or CompuServe: 70007,5547. (Please note that these are *not* the correct email addresses for technical support or subscription enquiries.)

### • DOS programs will not run

You must have at least 575kb free RAM in a Windows DOS box in order to run all the software on this CD. If you have less, much will work but some won't, so you may prefer to quit from Windows and (if you have DOS 6.0), use MEMMAKER.EXE to increase the free base RAM. If you don't have DOS 6.0, try removing all TSRs and unused drivers from your AUTOEXEC.BAT and CONFIG.SYS files by placing a REM command in front of

them. Alternatively, you could boot up from a backup of your DOS system disk, which will give you just about the maximum amount of free base RAM possible without using a memory manager.

### • The computer crashes or hangs

#### • Sound effects and music stop playing

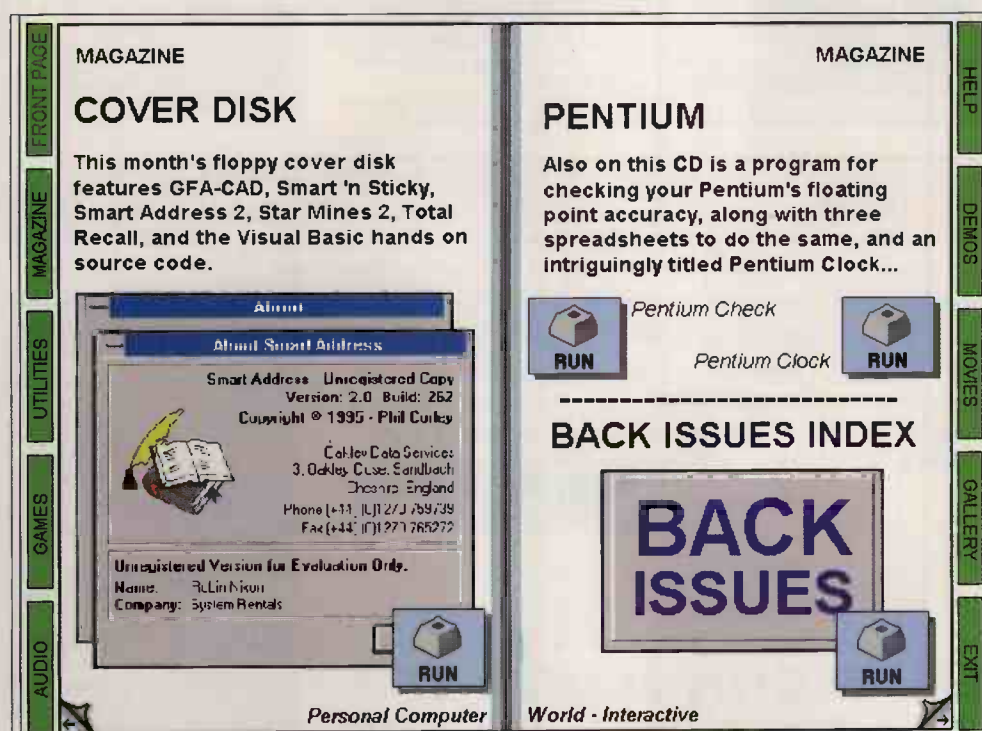
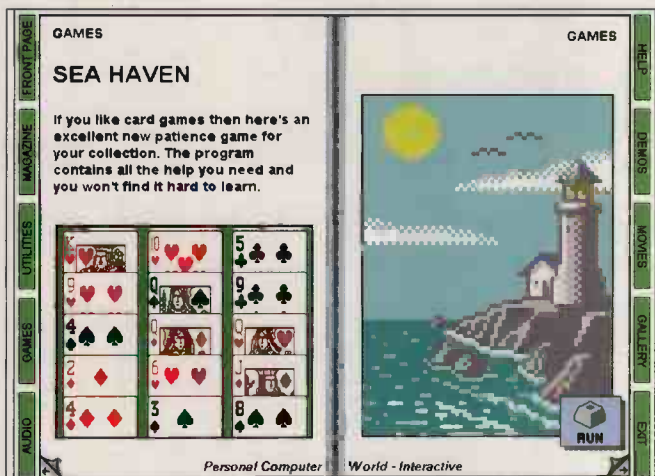
Neither of these should happen. However, with the huge amount of software supplied on this CD and the inherent instability of Windows, after using several of the programs in a single session, any unexpected problems can generally be corrected by simply exiting from and restarting Windows.

### • PCW Interactive runs slowly

We are now using Macro-media Director as the multimedia engine for PCWI as it offers a speed increase of several hundred percent over the previous system. However, to achieve this speed it requires 4Mb free RAM.

So, if you have 4Mb or less RAM you may experience delays when turning pages, as up to half of this RAM may already be in use by Windows and DOS. The solution is to add additional RAM to your PC or, at least, to ensure you have a permanent swapfile of an additional 4Mb RAM.

• Editorial note: The PCWI screenshots featured were taken direct from the disc and could not, therefore, be edited.





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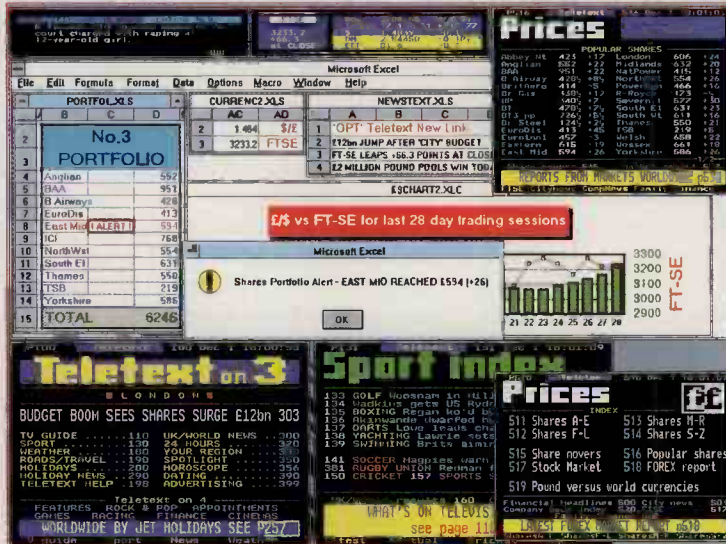
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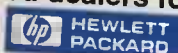
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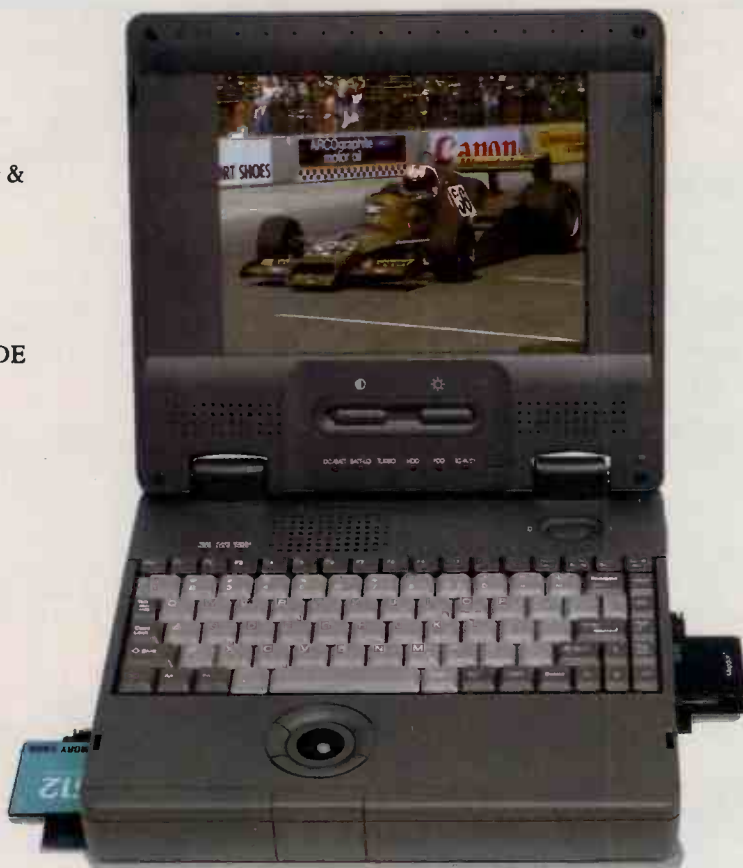


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- Simple upgradable 10" screen supporting 640x480 resolution (64 grey scale Mono STN, 256 colour Dual Scan Passive and 512 TFT Active Colour options available)
- VGA port supporting up to 1024 x 768 on external CRT
- NiMH battery giving 4 to 5 hours continuous operation
- 9-pin serial port, 25-pin parallel port with EPP support, PS/2 port and 160-pin docking station connector
- Built in 19mm diameter trackerball
- Weight: Mono 5.3lbs, Dual Scan 5.7lbs, TFT 6lbs

## UPGRADES & ACCESSORIES

|                            |       |      |
|----------------------------|-------|------|
| RAM Upgrade to:            | 8mb   | £169 |
|                            | 12mb  | £299 |
|                            | 20mb  | £695 |
| Hard Disk Upgrade to:      | 510mb | £249 |
|                            | 810mb | £399 |
| PCMCIA Fax Modems from     |       | £149 |
| PCMCIA Ethernet cards from |       | £179 |
| PCMCIA SCSI cards from     |       | £199 |
| Additional NiMH battery    |       | £89  |
| MS DOS 6.22 & Windows 3.11 |       | £75  |
| Docking Station            |       | £349 |
| De luxe carrying case      |       | £39  |

PRICES  
FROM £999



DX4-100 FROM  
£1199 + VAT

MINIMUM SPEC: 340MB HDD/4MB & RAM NiMH BATTERY

PERFORMER

## NOTEBOOK PRICES

|                      | 486SX-33 | 486DX2-50 | 486DX2-66 | 486DX4-75 | 486DX4-100 |
|----------------------|----------|-----------|-----------|-----------|------------|
| MONO                 | £999     | £1049     | £1099     | £1139     | £1199      |
| DUAL SCAN<br>PASSIVE | £1299    | £1349     | £1399     | £1439     | £1499      |
| TFT ACTIVE<br>COLOUR | £1899    | £1949     | £1999     | £2039     | £2099      |

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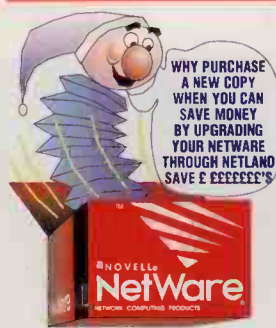
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**NOVELL NETWORK 4.1 & 3.12 STILL THE BEST PRICING IN THE U.K.**

|         |      |      |      |           |
|---------|------|------|------|-----------|
| NetWare | 3.12 | 5    | user | £482.00   |
| NetWare | 3.12 | 10   | user | £1145.00  |
| NetWare | 3.12 | 25   | user | £1590.00  |
| NetWare | 3.12 | 50   | user | £2350.00  |
| NetWare | 3.12 | 100  | user | £3359.00  |
| NetWare | 3.12 | 250  | user | £5950.00  |
| NetWare | 4.1  | 5    | user | £482.00   |
| NetWare | 4.1  | 10   | user | £1145.00  |
| NetWare | 4.1  | 25   | user | £1590.00  |
| NetWare | 4.1  | 50   | user | £2350.00  |
| NetWare | 4.1  | 100  | user | £3359.00  |
| NetWare | 4.1  | 250  | user | £5950.00  |
| NetWare | 4.1  | 1000 | user | £18900.00 |

**RING NOW! YOU WON'T BELIEVE HOW LOW THE PRICES ARE !!**

## TCP/IP

**NEW FROM FTP**

|                      |                |
|----------------------|----------------|
| <b>FTP 3.1</b>       | <b>£284.00</b> |
| <b>FTP ONNET 1.2</b> | <b>£389.00</b> |

FTP PC/TCP/IP Network Software for DOS/Windows  
FTP PC/TCP/IP Network Software for OS/2  
FTP PC/TCP/IP Site License 5/10/20 users & above  
FTP PC/TCP/IP KERNEL for DOS/Windows  
FTP PC/TCP/IP Development Kit for DOS/Windows  
FTP PC/TCP/IP Development Kit for OS/2  
Application Development Package for DOS/Windows; LANWatch Network Analyzer for DOS; PC/SNMP TOOLS; NFS Client; PC/BIND; TCP/IP Boot Proms for SMC, 3Com, NE2000 Etc.  
SPRY AIR NFS 3.0 £595.00  
WALKER RICHER & QUINN TCP £399.00  
FRONTIER TECH CORP  
SUPER TCP PRO FOR WINDOWS £595.00

## LAN PROFESSIONAL

|   |         |
|---|---------|
| PCMCIA Ethernet Card BNC/TP               | £103.00 |
| ISA NE2000 UTP/BNC                        | £33.00  |
| ISA NE2000 BNC only                       | £27.00  |
| ISA NE2000 UTP only                       | £59.95  |
| Parallel Port POCKET ADAPTER              | £299.00 |
| 4 Port BNC Repeater                       | £139.00 |
| 2 Port BNC Repeater                       | £269.00 |
| 6 Port BNC Repeater                       | £299.00 |
| 3 Port Novell Print Server                | £169.00 |
| 3 Port Novell/TCP Print Server            | £199.00 |
| 2 Parallel, 1 Serial Novell Print Server  | £219.00 |
| 2 Parallel, 1 Serial Nov/TCP Print Server | £269.00 |
| 8 Port Serial Card for SCO/ETC            | £129.00 |
| 8 Port UTP HUB                            | £117.00 |
| 12 Port UTP HUB                           | £239.00 |
| 16 Port UTP HUB                           | £269.00 |
| 24 Port UTP HUB                           | £369.00 |
| 32 Port UTP HUB                           | £499.00 |

## MICROSOFT

|                                    |         |
|------------------------------------|---------|
| WINDOWS 3.5 SERVER                 | £249.00 |
| WINDOWS WORKSTATION                | £299.00 |
| WINDOWS 3.5 SERVER                 | £249.00 |
| WINDOWS NT Client Pack Single user | £39.99  |
| WINDOWS NT Client Pack 20 user     | £469.00 |
| WFWG Starter Kit 2 user with cards | £269.00 |
| WFWG Add-on Kit 1 user with card   | £137.50 |
| WFWG Add-on Kit 2 user with cards  | £180.00 |
| WFWG Add-on Kit 1 user with card   | £95.00  |

**SCO Best Prices for SCO from Netland REGISTERED RESELLER**

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| <b>£39.95</b> | <b>With Network Card</b> |
| <b>£39.95</b> |                          |

**5 pack inc 5 Cards £190 !!**

|                                    |        |
|------------------------------------|--------|
| Personal Netware 2 User Kit        | £79.95 |
| Personal Netware 1 User Add-on Kit | £49.00 |

Above Kits include: NE2000 clone adapters, Cables, T. Pieces, Terminators

## GANDALF/RETIX/SONIX

**RETIX BRIDGE BUILDERS**

|                                     |         |
|-------------------------------------|---------|
| 2265M Local Ethernet Bridge         | £195.00 |
| 4650 High Speed Local Bridge        | £195.00 |
| 4760 High Speed Local Bridge/Router | £195.00 |
| 4810 Remote Bridge                  | £195.00 |
| 4820 Remote Bridge                  | £195.00 |
| 4850 Remote Bridge                  | £195.00 |
| 4880 Remote Bridge                  | £195.00 |

**SONIX LAN & WAN**

Sonix Communications  
Arpeggio Remote Ethernet Bridge  
Arpeggio Remote Ethernet ISDN Bridge  
ISDN Interface Card Remote Ethernet ISDN Bridge

**GANDALF**

|                                      |         |
|--------------------------------------|---------|
| LANLine5210; LANLine5220             | £195.00 |
| LANLine 5221 (PC Card)               | £195.00 |
| LANLine 5220i Optimiser Option       | £195.00 |
| LANLine 5221i (PC Card); LANLine522L | £195.00 |

Simply The Best Prices!

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**WOLLONGONG PathWay Access**

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PC-Xware from NCD is simply the best way to link Windows into UNIX

**CHAMELEON TCP for Windows**

**£269**

## APC UPS

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|----------------------------|---------|---------|
| APC UPS BACK-UP            | 250 VA  | £149.00 |
| APC UPS BACK-UP            | 400 VA  | £199.00 |
| APC UPS BACK-UP            | 600 VA  | £249.00 |
| APC UPS SMART              | 400 VA  | £239.00 |
| APC UPS SMART              | 600 VA  | £239.00 |
| APC UPS SMART              | 900 VA  | £285.00 |
| APC UPS SMART              | 1250 VA | £275.00 |
| APC UPS SMART              | 2000 VA | £275.00 |
| POWERCHUTE FOR NOVELL      |         | £59.00  |
| POWERCHUTE FOR SCO/UNIX    |         | £99.00  |
| Monitoring Card For Novell |         | £59.95  |

**NETLAND SUPPLIES ALL APC UPS UNITS WITH APC'S FREE POWERCHUTE**

## NETWARE LITE 1.1

|   |         |
|---|---------|
| Lite 1.1 when ordered with Card         | £69.95  |
| Lite 1.1 on its own                     | £69.95  |
| Lite 1.1 Low Cost 8 bit 2 user Kit      | £175.00 |
| Lite 1.1 Low Cost 8 bit 1 user Kit      | £88.00  |
| Lite 1.1 High Perform 16 bit 2 user Kit | £223.00 |
| Lite 1.1 High Perform 16 bit 1 user Kit | £110.00 |

**NETWARE 10 USER KIT**

|                     |  |
|---------------------|--|
| 10 User Novell 3.12 |  |
| 11 x NE2000 BNC/TP  |  |
| 10 Metre BNC Cable  |  |
| <b>£1424</b>        |  |

## UNIX CONNECTIVITY

|                                  |          |
|----------------------------------|----------|
| LAN WorkGroup v4.2 5 user        | £728.00  |
| LAN WorkGroup v4.2 10 user       | £1211.00 |
| LAN WorkPlace for DOS 1 user     | £189.00  |
| LAN WorkPlace for DOS 10 user    | £975.00  |
| NetWare NFS Gateway v1.2 5 user  | £1040.00 |
| NetWare NFS Gateway v1.2 10 user | £1730.00 |
| NetWare NFS Starter Kit          | £728.00  |
| NetWare /IP v1.1 5 user          | £745.00  |
| NetWare /IP v1.2 10 user         | £441.00  |
| NetWare /IP v1.2 25 user         | £679.00  |
| UnixWare Personal Edition CD     | £ring    |
| UnixWare Personal Edition Tape   | £ring    |

**On All Connectivity Products We Will Give You The Best Price**

## Sun NFS

**SUNPC-NFS**

Includes TCP/IP

**SINGLE USER**

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**Powerlite Off-Line**

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|-------|--------|---------|
| PL250 | 250 VA | £112.95 |
| PL400 | 400 VA | £144.95 |
| PL600 | 600 VA | £190.95 |

**Accupower Select Line Interactive**

|             |         |         |
|-------------|---------|---------|
| SELECT 400  | 400 VA  | £233.95 |
| SELECT 600  | 600 VA  | £229.95 |
| SELECT 900  | 900 VA  | £399.95 |
| SELECT 1400 | 1400 VA | £583.95 |
| SELECT 2000 | 2000 VA | £849.95 |

**Accupower Gold On-Line**

|        |         |          |
|--------|---------|----------|
| AU600  | 600 VA  | £426.95  |
| AU1000 | 1000 VA | £579.95  |
| AU1500 | 1500 VA | £799.95  |
| AU2100 | 2100 VA | £1249.95 |

**POWERMON NOVELL** £77.95  
**POWERMON UNIX** £77.95  
**POWERMON LAN MANAGER** £45.95

## NETWARE 5 USER KIT

**5 User Novell 3.12 6 x NE2000 BNC/TP 5 Metre BNC Cable**

**£744**

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CB8 7NY

**TEL: 01638 720999**  
**FAX: 01638 721424**

## ENTERPRISE CONNECTIVITY

|                                      |          |
|--------------------------------------|----------|
| NetWare for SAA 16 session           | £973.00  |
| NetWare for SAA 64 session           | £2919.00 |
| NetWare HosPrint 16 session          | £581.00  |
| NetWare HosPrint 128 session         | £1456.00 |
| NetWare Connect 2 Port               | £287.00  |
| NetWare Connect 32 Port              | £1071.00 |
| NetWare Multi Protocol Router        | £728.00  |
| NetWare Multi Protocol Plus          | £504.00  |
| NetWare for Macintosh v3.12 200 user | £483.00  |
| NetWare for Macintosh v4 Unlimited   | £581.00  |

**NETWORK MANAGEMENT**

|                                   |          |
|-----------------------------------|----------|
| LANalyzer for MS Windows v2.1     | £728.00  |
| NetWare LANalyzer Agent 1-segment | £728.00  |
| NetWare LANalyzer Agent multi-seg | £1211.00 |
| NetWare Management Sys v2.0       | £1211.00 |

## DAT TAPES

**HP Jetstore 5000**

|  |          |
|--|----------|
| 4GB Ext DDS-1 Drive  | £915.00  |
| 4GB Int DDS-1 Drive  | £799.00  |
| C1524E-ALN 4GB Ext DDS-1 Drive for Novell with Arcserve and ISA Controller | £1592.00 |

**HP Jetstore 6000**

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|--|----------|
| 8GB Int DDS-2 Drive  | £928.00  |
| C1529A 8GB Ext DDS-2 Drive   | £1044.00 |
| C1531A-ALN 8GB Int DDS-2 Drive for Novell with Arcserve and ISA Controller | £1888.00 |

**HP Jetstore 2000**

|  |         |
|--|---------|
| C1520E 2GB Ext DDS-1 Drive   | £825.00 |
| C1525A 2GB Int DDS-1 Drive   | £739.00 |
| C1523E-ALN 2GB Ext DDS-1 Drive for Novell with Arcserve and ISA Controller | £934.00 |

**SONY DAT DRIVES**

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| 8 - 16 GB Internal            | £799.00 |
| 8 - 16 GB External            | £899.00 |
| Int KIT inc Software and Card | £899.00 |
| Ext KIT inc Software and Card | £999.00 |

## CHEYENNE

**ARCserve for NETWORK - DOS EDITION**

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|-----------------------------------|---------|
| ARCserve for NetWare NLM 5-user   | £229.00 |
| ARCserve for NetWare NLM 10-user  | £379.00 |
| ARCserve for NetWare NLM 25-user  | £529.00 |
| ARCserve for NetWare NLM 50-user  | £799.00 |
| ARCserve for NetWare NLM 100-user | £899.00 |

**ARCserve for NETWORK - VAP**

|                                   |         |
|-----------------------------------|---------|
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| ARCserve for NetWare VAP 10-user  | £349.00 |
| ARCserve for NetWare VAP 100-user | £549.00 |

**ARCserve for NETWORK - WINDOWS EDITION**

|                                       |          |
|---------------------------------------|----------|
| ARCserve for NetWare Windows 5-user   | £239.00  |
| ARCserve for NetWare Windows 10-user  | £425.00  |
| ARCserve for NetWare Windows 25-user  | £629.00  |
| ARCserve for NetWare Windows 50-user  | £899.00  |
| ARCserve for NetWare Windows 100-user | £1029.00 |
| ARCserve for NetWare Windows 250-user | £1495.00 |

**ARCserve for DOS**

|                      |         |
|----------------------|---------|
| ARCserve for DOS     | £149.00 |
| ARCserve for Windows | £139.00 |
| ARCserve for OS/2    | £299.00 |

## ALLIED TELLESIS

**BNC Micro Transceiver**

|   |         |
|---|---------|
| BNC Slimline Micro Transceiver          | £113.00 |
| 10 BaseT Slimline Micro Transceiver     | £113.00 |
| Fibre Optic FOIRL SMA Micro Transceiver | £113.00 |
| Fibre Optic FOIRL/ST Micro Transceiver  | £113.00 |

**Micro Repeater**

|                             |         |
|-----------------------------|---------|
| AUI to UTP                  | £180.00 |
| Micro Repeater BNC to UTP   | £180.00 |
| Micro Repeater UTP to FIBRE | £371.00 |
| Micro Repeater BNC to FIBRE | £371.00 |
| Micro Repeater AUI to BNC   | £299.00 |
| Micro Repeater AUI to AUI   | £251.00 |
| Micro Repeater AUI to BNC   | £251.00 |

**UTP Hub**

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| 4 Port                | £412.00  |
| 8 Port                | £142.00  |
| 12 Port               | £279.00  |
| 24 Port               | £529.00  |
| 48 Port               | £529.00  |
| Stackable Hub 12 Port | £529.00  |
| Stackable Hub 24 Port | £529.00  |
| Stackable Hub 48 Port | £529.00  |
| Stackable Hub 8 Port  | £825.00  |
| Stackable Hub 6 Port  | £1057.00 |



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## PCMCIA ETHERNET

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| <b>BNC &amp; TP</b> | <b>£109.00</b> |
|---------------------|----------------|

## NETLAND MODEMS

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| Sportster 14.4 + Fax Int      | £152.00 |
| Courier V34 + Fax External    | £274.00 |
| Courier V34 + Fax Internal    | £289.00 |
| Worldport HST dual std PCMCIA | £192.00 |
| Worldport PCMCIA 2496 + Fax   | £155.00 |

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**ETHEREXPRESS FLASH C Combo** **£127.00**

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**ETHEREXPRESS FLASH 32** **£127.00**

**ETHEREXPRESS MCA HUB or TP** **£168.00**

**ETHEREXPRESS ISA HUB** **£587.00**

**ETHEREXPRESS EISA HUB** **£687.00**

**ETHEREXPRESS Expansion HUB** **£507.00**

**ETHEREXPRESS RJ45 Harmonica** **£53.00**

**Intel Netport II TP** **£289.00**

**Intel Netport II BNC** **£289.00**

**Intel Netport II Token Ring** **£495.00**

**Intel Express XL TP** **£495.00**

**Intel Express XL BNC** **£495.00**

**Intel LANdesk Manager** **£799.00**

**TokenExpress MCA 16/4** **£199.00**

**TokenExpress ISA/16** **£199.00**

**TokenExpress EISA 16/4** **£199.00**

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**ETHEREXPRESS PRO Flash 16C BNC/TP** **£65.00**

## D-LINK

**POCKET ADAPTERS**

**DE600E BNC** **£98.00**

**DE600TPE TP** **£98.00**

**DE600AUI AUI** **£139.00**

**DE600CTE BNC/TP** **£139.00**

**DE620CT BNC/TP** **£169.00**

**DE620 BNC** **£159.00**

**DE620TP BNC/TP** **£159.00**

**DE620AUI AUI** **£159.00**

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**DE650 COMBO** **£182.00**

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**DE852 AUI to thick coax N-Series** **£89.00**

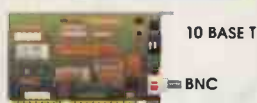
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**DE853 AUI to TP** **£59.00**

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**3C509 TP £55**

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**SMC3812 HUB TP 12 Port** **£399.00**

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**ELITEPORT Pocket Adapter** **£199.00**

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**TOKEN RING 16/4 16 bit MCA** **£199.00**

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### D-Link

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**DE804 4 PORT** **£369.00**

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## D-LINK



### D-LINK NETWORK CARDS

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**DE220 BNC/AUI ISA** **£59.00**

**DE220C BNC ISA** **£59.00**

**DE220T TP ISA** **£65.00**

**DE220TP TP/AUI ISA** **£69.00**

**DE220CT BNC/TP ISA** **£225.00**

**DE320CT COMBO MCA** **£135.00**

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**Novell Boot Rom For 3.12** **£19.00**

## 3COM

**3C509 BNC** **£65.00**

**3C509 TP & BNC COMBO** **£55.00**

**3C509 TP or BNC** **£59.00**

**3C503 TP or BNC** **£123.00**

**3C523B BNC MCA** **£185.00**

**3C523B TP MCA** **£243.00**

**3C527B or MCA 32** **£467.00**

**3C529 TP or BNC MCA** **£155.00**

**3C579 TP or BNC** **£207.00**

**Linkbuilder 10BT HUB3C621** **£65.00**

**Linkbuilder 10BT HUB3C622** **£1203.00**

**Linkbuilder FMS HUBBNC** **£1427.00**

**Linkbuilder FMS HUBTP** **£717.00**

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**3C589 TP PCMCIA** **£189.00**

**3C589 TP & BNC PCMCIA** **£229.00**

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**3COM Fast EtherLink PCI 10/100** **£299.00**

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**16 Bit NE-2000 BNC/TP TURBO** **£39.00**

**16 Bit E/net Card Plug/Play** **£65.00**

**EISA Ethernet Card** **£139.00**

**VL-Bus Local Ethernet Card** **£99.00**

**MCA PS/2 Ethernet Card** **£109.00**

**PCI 32 Bit Ethernet Card** **£349.00**

**Pocket Adapter works off Parallel Port** **£69.95**

**PCMCIA Ethernet Card** **£119.00**

**Fibre Optic Ethernet Cards** **£199.00**

**16 Bit BUS ARCNET** **£99.00**

**16 Bit Star ARCNET** **£99.00**

**16 Bit 16/4 Mbps TOKEN RING** **£199.00**

## XIRCOM



**ETHERNET III ADAPTER BNC** **£249.00**

**ETHERNET III ADAPTER TP** **£249.00**

**ETHERNET III ADAPTER COMBO** **£269.00**

**TOKEN RING II ADAPTER 16/4** **£495.00**

**TOKEN RING II ADAPTER 16/4 TP** **£495.00**

**EXTERNAL ETHERNET ADAPTER** **£385.00**

**EXTERNAL TOKEN-RING ADAPTER** **£495.00**

**POCKET TOKEN-RING ADAPTER** **£495.00**

**POCKET ETHERNET PRINT SERVER BNC** **£499.00**

**POCKET ETHERNET PRINT SERVER TP** **£499.00**

**CREDIT ETHERNET ADAPTER BNC PCMCIA** **£229.00**

**CREDIT ETHERNET ADAPTER TP PCMCIA** **£199.00**

## TOKEN RING

**SMC TOKEN RING 16/4 16bit ISA** **£219.00**

**SMC TOKEN RING 16/4 16 bit MCA** **£219.00**

**SMC TOKEN RING MAU Passive 8 Pt** **£439.00**

**SMC TOKEN RING MAU Passive 16 Pt** **£599.00**

**3COM TOKENLINK III 16/4 ISA** **£199.00**

**3COM TOKENLINK III 16/4 MCA** **£324.00**

**3COM TOKENLINK III 16/4 32 BIT EISA** **£389.00**

**3COM TOKENLINK III 16/4 PCMCIA** **£299.00**

**IBM TOKENRING 16/4 ISA** **£239.00**

**IBM TOKENRING 16/4 MCA** **£299.00**

**IBM TOKENRING 16/4 32 BIT EISA** **£389.00**

**IBM TOKENRING 16/4 PCMCIA** **£299.00**

## MICRODYNE



**NE5000 32 bit Plug-N-Play BNC/TP** **£199.00**

**NE2500 16 bit ISA BNC/TP Plug-N-Play** **£199.00**

**NE2500T 16 bit ISA TP Plug-N-Play** **£199.00**

**NE3300 32 bit EISA BNC/AUI/TP** **£199.00**

**NE3200 32 bit EISA Bus Master BNC/AUI** **£199.00**

**NE3200T 32 bit EISA Bus Master TP/AUI** **£199.00**

**NE4200 16 bit PCMCIA BNC/TP** **£199.00**

**NE2000+ 16 bit ISA BNC** **£199.00**

**NE2000+ 16 bit ISA TP** **£199.00**

**NE2000+ BNC/AUI/TP with anti-virus** **£199.00**

## WEB REPEATERS

**2 port Repeater 2 X BNC** **£139.00**

**2 port Repeater 2 X BNC 1 X AUI** **£159.00**

**2 port Repeater 2 X BNC 2 X AUI** **£169.00**

**2 port Repeater 2 X BNC 2 X AUI 2 X TP** **£199.00**

**2 port Repeater which can be up-graded to 4 port (2 X BNC 2 X AUI)** **£169.00**

**2 PORT INTERNAL CARD** **£149.00**

**4 port Repeater 4 X BNC** **£269.00**

**4 port Repeater 4 X BNC 4 X AUI** **£279.00**

**4 port Repeater Rack Mount 4BNC 4AUI** **£299.00**

**4 port Repeater 4 X BNC 4 X AUI 2 X TP** **£349.00**

**6 port Repeater 6 X BNC 6 AUI** **£349.00**

**6 port Repeater fiber Optic Repeater** **£199.00**

## WEB HUBS



**10 Base T 6 Port Hub + 1 X BNC** **£159.00**

**10 Base T 6 Port Hub** **£149.00**

**10 Base T 8 Port Hub + 1 X BNC** **£159.00**

**10 Base T 8 Port Hub** **£149.00**

**10 Base T 8 Port Hub Internal Card** **£279.00**

**10 Base T 12 Port Hub + 1 X BNC** **£279.00**

**10 Base T 16 Port Hub + 1 X BNC** **£299.00**

**10 Base T 16 Port Hub + 1XBNC+1AUI** **£325.00**

**10 Base T 16 Port SNMP Hub + 1XBNC** **£499.00**

**10 Base T 16 Port Hub Internal Card** **£499.00**

**10 Base T 24 Port Hub + 1 X BNC** **£449.00**

**10 Base T 24 Port SNMP Hub + 1XBNC** **£699.00**

**10 Base T 24 Port SNMP Hub Int Card** **£899.00**

**10 Base T 32 Port Hub + 1 X BNC** **£725.00**

## BARGAINS

**only £169**



**Original NE2000+ 's**

**NE2000+ BNC £39.95**

**NE2000+ TP £39.95**

**while stocks last**

## PCMCIA

**NEW V.34**



**DACOM PCMCIA FAX MODEM GOLD CARD V34 + FAX**

**£299.00**

**V.34 VFC, V.32bis, V.23, V.22bis, V.22 & V.21**

**High Speed v.17 send/fax (14,400bps)**

**V.42 MNP2-4 & MNP 10 error correction**

**V.42bis & MNPS data compression**

**WinFax Lite Software**

**Hayes AutoSync for mainframe and mini connectivity**

**Two Year Warranty**

## HEWLETT PACKARD

**HP Special Promotion J2552A JET DIRECT ONLY £299**

**ETHERTWIST ADAPTER CARD BNC** **£119.00**

**ETHERTWIST ADAPTER CARD TP** **£49.00**

**ETHERTWIST ADAPTER CARD 32** **£139.00**

**HP Jetstore 2000** **£1449.00**

**HP Jetstore 5000** **£2399.00**

**JetDirect Ethernet Thin Laserjet II, IIi, IIId, IIId, IIId, IIId** **£199.00**

**JetDirect Token Ring Laserjet II, IIi, IIId, IIId** **£199.00**

**JetDirect Ethernet for Unix 10BT Laserjet** **£199.00**

**JetDirect HP-IB Laserjet 4, IIISi, PJ XL300, DJ600** **£199.00**

## WEB

**WEB COMBO POCKET ADAPTER only £69.95**



**yes BNC AND TP**

## WEB

**COMPACT 2 PORT REPEATER 2 X BNC PORTS 1 X AUI**



**£139**

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**Netland (UK) Ltd.**

**5F Lynx Business Pk**

**Newmarket. Cambs.**

**CB8 7NY**

**TEL: 01638 720999**

**FAX: 01638 721424**

## GENIUS



**GE2000 BNC/TP £32.00**

## 100 MBPS

**3COM Fast EtherLink PCI 10/100** **£299.00**

**3COM Fast EtherLink EISA 10/100** **£324.00**

**SMC EtherPower PCI 10/100** **£389.00**

**SMC EtherPower EISA 10/100** **£299.00**

**INTEL EtherExpress PRO/100** **£299.00**

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**2 Parallel Ports** **£199.00**

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**BNC & AUI & TP Connections** **£199.00**

**Simple Installation** **£199.00**

**2 Year Warranty** **£199.00**

**EVERY NOVELL NETWORK WITH A PRINTER DESERVES ONE OF THESE**

**only £279**

## WHAT COULD BE EASIER !!!



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**Tel: 01638 720999 Fax: 01638 721424**



**Want to be  
cool on the Internet  
without diving in  
at the deep end?**



**go direct to dan** >>>



# The Perfect PC for Home & Business

Multimedia - Modem - FAX - TV - Sound - Business, Education & Games Software

Dan has raised Personal Computing to a higher level with the introduction of the **dan Supermedia**, a new system that maximises the potential of the latest technology. A rapidly increasing amount of people use their PCs at home both for work and for leisure and the **dan SuperMedia** has been specially designed to perform well with many different applications.

The system incorporates a fax modem that gives you the ability to access millions of global users through the internet. You can, of course, also use it to send faxes directly from your word processor or other software applications. In addition to full Multimedia capability, this PC has an inbuilt TV receiver that allows you to either watch television

on your PC monitor or to capture images for later use. Added to this, you will receive an abundance of software titles suitable for the whole family.

The **dan SuperMedia** is an ideal choice for both home and business and it will give the entire family many hours of productivity and pleasure.



## dan Supermedia

- 14.4 BPS Fax / Modem
- TV Card with Capture & AVI record
- Intel 486 DX2-66 Processor
- 8 MB RAM with Parity
- 256KB Cache Memory
- Pentium® OverDrive® Processor Upgradable
- Free slots: 1 PCI and 1 VL or PCI
- 1MB PCI Stealth 64 DRAM Accelerator
- Fast PCI IDE Hard Disk Controller
- 420MB / 14ms IDE Hard Disk
- 1.44MB Floppy disk Drive
- Mini Tower Case w/200W PSU
- 1 Parallel & 2 FAST Serial Ports
- 102 Key UK Keyboard
- New Microsoft Mouse
- Multimedia MPC 2 Kit

Double Speed CD-ROM  
SOUND FX Wave 32 Soundcard  
dan Advanced Speakers & Microphone

- Software Bundle
  - Windows for Workgroups 3.11
  - MS DOS 6.22
  - ENCARTA '95 Encyclopedia
  - MS Works 3.0
  - MS Money
  - Theme Park
  - Mega Race
  - Wing Commander II Deluxe
  - Chess Master 4000
  - MS Scenes
  - LOTUS Organizer for Windows
  - I Learn Sitting on the Farm
  - Dr T's Sing a Long (Kids Karaoke)
  - Mavis Beacon Teaches Typing
  - Speed
  - Space Adventure
  - Under Sea Adventure
  - World Atlas

14" Monitor £ 1525

15" Monitor £ 1599

### 14.4 BPS FAX - Modem

This is your gateway to the outside world. You can now send and receive faxes from your PC as well as talk to millions of other computer users through services like CIX, Compuserve, Demon etc (available on subscription). You can 'cruise' the INTERNET, find out information on almost any subject and even do some of your shopping.



### TV Tuner Card with Capture

This card combines TV program viewing with digital video recording on your PC. It enables the PC to receive TV broadcast signals directly from an antenna or cable and display a live TV program on your standard VGA monitor. You can even connect it to a VCR, laser disk player or camcorder. With all these inputs you can then create AVI (Audio Video Interleaved) movies to play back on other Personal Computers.

### Sound FX WAVE 32

When a game or multimedia program calls for music or special effects, this sound card is in a league of its own. It uses wavetable synthesis and it has a special chipset that contains actual pre-recorded sounds called samples. Simply put, the audio tracks on your applications will sound like they are coming from an expensive home stereo and not your computer.



Delivery cost to most of UK for one system is £15. All prices exclude VAT @ 17.5%. E. & O.E.

**LIFETIME GUARANTEE:** First year back-to-base parts & labour. Thereafter labour (excludes monitors and printers) and Hotline telephone support only. Optional 8-working hour response ON-SITE maintenance (£30 for first year). **14 DAY MONEY BACK GUARANTEE IF NOT SATISFIED** (excludes printers & Software). dan Technology Systems prices and specifications are subject to change without notice. All sales are subject to dan Technology plc terms and conditions, a copy of which may be obtained on request. All trademarks acknowledged. Intel, Pentium and OverDrive are trademarks of Intel Corporation in the USA and other countries.

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FAX: 0181 - 830 1122  
FAX: 0113 - 239 0652



**dan**  
technology plc

# Special Configurations

Dan technology has developed personal computers with set configurations which are even better

1995 is the year of the Internet and dan technology is ready to help you jump in as easily and painlessly as possible. Dan's commitment to continuous improvement and customer satisfaction has already resulted in numerous awards and accolades, both from customers and industry experts. During 1993 and 1994 dan received more than forty awards, and new awards have continued to be given to dan throughout 1995. Dan also won PC Magazine's Overall Satisfaction with Service and Reliability Award for two years running. Therefore you know you can rely on dan.

**Dan can help you keep your cool on the Internet.**

All of dan's award winning systems can be easily upgraded to work perfectly on the Internet. All you need is the simple addition of a dan internal modem which can be fitted to any dan system. We will pre-configure the modem to work with your computer. All you have to do is dial the communications company of your choice, pay your subscription, and you'll be ready to dive into the Internet!

If you want to get into the Internet without going in over your head, the obvious choice is dan.



Delivery cost to most of UK for one system is £15. £30 alteration charge is payable for any changes or upgrades to Special Configuration Systems. (These are the systems with the standard hard disk drive).

All prices exclude VAT @ 17.5%. E.&O.E.

## NEW DAN SYSTEMS FOR '95

Dan has introduced two new Personal Computers to its range of Special Offer Systems. These have been designed to work exceptionally well with the higher demands of the new Windows '95 software.

The dan '95 systems are available in two versions - the **dan 95/s** is based on the popular Intel 486 Processor while the **dantium 95/s** is based on the powerful Intel Pentium® processor.

Both computers use the PCI BUS and include 16MB RAM with parity, large fast hard disk drives and new PCI Stealth 64 video cards with 2MB VRAM for outstanding speed and colour capability.

## dan Ultimate PC

The **dan Ultimate PC** is the system you've been waiting for. It includes everything you ever dreamed of - nothing has been omitted. This computer has the fastest possible CPU, a giant hard drive, large monitor and high performance sound card. In addition, you get a quad-speed CD ROM, dan fax/modem and even a super powerful DAT tape streamer. If you're looking for the best, this one is unbeatable.



Intel 486  
PROCESSOR

## dan 95/s

Special Offer 486 Power System

- 16 MB RAM with Parity
- 256KB Cache Memory
- Intel 486 DX2-66 or DX4-100 CPU
- Free Slots: 1 PCI, 1 PCI or VL & 3 ISA
- 2MB Stealth 64 VRAM Accelerator
- Fast PCI IDE Hard Disk Controller
- 525MB / 12ms IDE Hard Disk
- 15" Microprocessor controlled non-interlaced Low Radiation Monitor
- 1.44MB Floppy disk Drive
- Desktop or Mini Tower Case w/200W PSU
- 1 Parallel & 2 Fast Serial Ports
- 102 Key UK Keyboard
- New Microsoft Mouse
- Windows for Workgroups 3.11
- MS DOS 6.22
- Lotus Organizer for Windows

486DX2-66 £ 1388

486DX4-100 £ 1482

1GB EIDE Hard disk Drive Upgrade Add £ 132

## Other Configurations

Based on the above specification with 14" Monitor & your choice of hard disk drive & CPU.

Intel 486 Processor  
DX4/100 | DX2/66 | DX2/50

|       |       |       |       |
|-------|-------|-------|-------|
| 525MB | £1472 | £1374 | £1338 |
| 850MB | £1522 | £1424 | £1388 |
| 1GB   | £1609 | £1511 | £1475 |

The systems below come with SCSI HDDs

|        |       |       |       |
|--------|-------|-------|-------|
| 1.04GB | £1899 | £1801 | £1765 |
| 2.10GB | £2231 | £2133 | £2097 |

➤ Indicates differences between configurations



pentium  
PROCESSOR

## dantium 95/s

Special Offer Pentium® Processor System

- 16 MB RAM with Parity
- 256KB Cache Memory
- 75 or 90MHz PENTIUM® Processor
- Free Slots: 1 PCI, 1 PCI or ISA & 3 ISA
- 2MB Stealth 64 VRAM Accelerator
- Fast PCI IDE Hard Disk Controller
- 525MB / 12ms IDE Hard Disk
- 15" Microprocessor controlled non-interlaced Low Radiation Monitor
- 1.44MB Floppy disk Drive
- Desktop Case w/200W PSU
- 1 Parallel & 2 Fast Serial Ports
- 102 Key UK Keyboard
- New Microsoft Mouse
- Windows for Workgroups 3.11
- MS DOS 6.22
- Lotus Organizer for Windows

75MHz £ 1599

90MHz £ 1795

100MHz £ 1895

1GB EIDE Hard disk Drive Upgrade Add £ 132

## Other Configurations

Based on the above specification with 14" Monitor & your choice of hard disk drive & CPU.

PENTIUM® Processor  
100MHz | 90MHz | 75MHz

|       |       |       |       |
|-------|-------|-------|-------|
| 525MB | £1898 | £1798 | £1593 |
| 850MB | £1948 | £1848 | £1643 |
| 1GB   | £2035 | £1935 | £1730 |

The systems below come with SCSI HDDs

|        |       |       |       |
|--------|-------|-------|-------|
| 1.04GB | £2325 | £2225 | £2020 |
| 2.10GB | £2657 | £2557 | £2352 |

## What makes dan Systems

All dan systems have DOS

& Windows installed

"Ready to Run" and include:

MEMORY WITH  
**PARITY**  
WE DO NOT CUT CORNERS!  
DISCOVER MEMORY  
FAULTS BEFORE  
IT'S TOO LATE

Parity checking is a hardware technique that alerts you to hardware memory faults before potential damage of data can occur through memory corruption of your software.

15"  
Non Interlaced  
MPR II

15" Non-Interlaced Low Radiation Monitor with Microprocessor



New Microsoft Ergonomic Mouse

# go direct to dan



# at Special Offer Prices

dan /S systems

value for money. These systems are based on our best selling models and the prices are unbeatable.



**pentium**  
PROCESSOR

## dan **PCi** **Ultimate PC**

The PC you always dreamed of

100MHz Pentium Processor  
16MB RAM - 1GB HDD  
2MB VRAM Video Card  
2GB DAT Tape Streamer  
17" Monitor - 4x CD-ROM  
SoundBlaster AWE 32  
FAX/Modem - Network Card

- 16 MB RAM with Parity
- 256KB Cache Memory
- 100MHz PENTIUM® Processor
- Free Slots: 2 PCI
- 2MB Stealth 64 VRAM Accelerator
- Fast PCi IDE Hard Disk Controller
- 1GB / 12ms IDE Hard Disk
- 17" Microprocessor controlled non-interlaced Low Radiation Monitor
- 4x Speed AT-BUS CD-ROM
- SoundBlaster AWE 32
- Hi-Fi Power dan Speakers (80W PMPO)
- dan Internal 14.4BPS Fax/Modem
- 16-Bit Network Card
- 2GB DAT Tape Streamer
- 1.44MB Floppy disk Drive
- Full Size Tower Case w/220W PSU
- 1 Parallel & 2 Fast Serial Ports
- 102 Key UK Keyboard
- New Microsoft Mouse
- Windows for Workgroups 3.11
- MS DOS 6.22
- Encarta '95, MS Works, MS Money, Lotus Organizer for Windows, Scenes

**pentium**  
PROCESSOR

100MHz £ 3576

As above without the DAT Streamer

100MHz £ 2992

### 14.4BPS FAX - Modem

Add £99

This is your gateway to the outside world. You can now send and receive faxes from your PC as well as talk to millions of other computer users through services like CIX, Compuserve, Demon etc (available on subscription). You can 'cruise' the INTERNET, find out information on almost any subject and even do some of your shopping.

from **£1338**



dan Mini Tower Case

## better than others



Large  
Fast EIDE  
Hard Disk  
Drives  
(420MB with  
Premium)



Fast 64-bit  
Graphic Processor  
Windows  
Accelerators  
from DIAMOND  
(except Premium)



August 1994  
dan Desktop Systems



August 1993  
dan Desktop Systems

The unparalleled dan Service & Support that has won dan technology more awards than any other computer company in UK.



"A well-specified system, the dan dantium90-PRO includes everything needed to handle multimedia, backing this up with good quality components throughout. The screen, in particular, is superb - due mainly to the TRINITRON tube - and together with the Diamond Stealth 64 graphics card lifts the dantium above the ordinary." *PC Magazine, (dantium 90MM), January '95*



"Dan's machines are presented in a consistent and professional manner. The 15" digital monitor gives a clear, bright image and handles resolution changes extremely well. The excellent set of performance results ensures top place among the DX4/100, but then it does have an excellent multimedia configuration and good quality presentation." *Computer Shopper, (dan 95MM), April '95*

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Opening Hours / Showroom: Mon-Fri 10am-6pm

**dan**  
technology plc



# dan does it better



Computer Buyer, February '95

## The three classic ranges of PCs for Windows available from dan technology

Windows is a complex operating system and it needs personal computers with advanced technology to make the most of its potential.

dan has created three distinct ranges suitable for all levels of Windows and DOS users. They combine high performance, superb reliability and quality, together with excellent value for money. All dan systems, irrespective of price, are built with the highest quality components and are fully upgradable.

The dan Premium is an entry level Windows system for the value conscious Windows user. The Local Bus Video and Hard Disk Controller give excellent performance in programs that are graphics oriented, including entry level CAD, Windows and desktop publishing, e.g. Microsoft Publisher.

The dan for Windows delivers advanced technology and high performance to create the perfectly optimised Windows solution. This system is for the power user who is running graphics intensive programs and the most demanding Windows applications such as Pagemaker, Corel Draw and AutoCad, which make the most advantage of caching controllers and powerful video accelerators.

The dantium personal computer is a high power system. It uses PCi Local Bus, the latest in computer architecture together with the incredible processing power of the Pentium® Processor. Dan has obviously come up with yet another star performer!



Intel 486  
PROCESSOR

### dan Premium/s

Special Offer 486 Windows System

- 8 MB RAM with Parity
- 256KB Cache Memory
- • Pentium® Overdrive® Processor Upgradable
- • Free Slots: 1 PCi, 1 PCi or ISA & 3 ISA
- • 1MB PCi S3 Trio32 DRAM Accelerator
- Fast IDE PCi Hard Disk Controller
- • 420MB / 14ms IDE Hard Disk
- • 15" Microprocessor controlled non-interlaced Low Radiation Monitor
- 1.44MB Floppy disk Drive
- • Desktop Case w/200W PSU
- • 1 Parallel & 2 Serial Ports
- 102 Key UK Keyboard
- New Microsoft Mouse
- Windows for Workgroups 3.11
- MS DOS 6.22
- Lotus Organizer for Windows

486DX2-66 £ 1011

486DX4-100 £ 1105



Intel 486  
PROCESSOR

### dan for Windows/s

Special Offer 486 Power System

- 8 MB RAM with Parity
- 256KB Cache Memory
- • Pentium® Overdrive® Processor Upgradable
- • Free Slots: 3 ISA
- • 1MB Stealth 64 DRAM Accelerator
- 2MB VL IDE Cache Controller
- • 525MB / 12ms IDE Hard Disk
- • 15" Microprocessor controlled non-interlaced Low Radiation Monitor
- 1.44MB Floppy disk Drive
- • Desktop Case w/200W PSU
- • 1 Parallel & 2 Fast Serial Ports
- 102 Key UK Keyboard
- New Microsoft Mouse
- Windows for Workgroups 3.11
- MS DOS 6.22
- Lotus Organizer for Windows

486DX2-66 £ 1179

486DX4-100 £ 1273

1GB EIDE Hard disk Drive Upgrade Add £ 132



pentium  
PROCESSOR

### dantium/s

Special Offer Pentium® Processor System

- 8MB RAM with Parity
- 256KB Cache Memory
- • 75,90 or 100MHz PENTIUM® Processor
- • Free Slots: 1 PCi, 1 PCi or ISA & 3 ISA
- • 1MB PCi Stealth 64 DRAM Accelerator
- Fast IDE Hard Disk Controller
- • 525MB / 12ms IDE Hard Disk
- • 15" Microprocessor controlled non-interlaced Low Radiation Monitor
- 1.44MB Floppy disk Drive
- • Desktop Case w/200W PSU
- • 1 Parallel & 2 Fast Serial Ports
- 102 Key UK Keyboard
- New Microsoft Mouse
- Windows for Workgroups 3.11
- MS DOS 6.22
- Lotus Organizer for Windows

75MHz £ 1267

90MHz £ 1463

100MHz £ 1563

1GB EIDE Hard disk Drive Upgrade Add £ 132

### Other Configurations

Based on the above specification with 14" Monitor & your choice of hard disk drive & CPU.

|       | Intel486 Processor |        |        |
|-------|--------------------|--------|--------|
|       | DX4/100            | DX2/66 | DX2/50 |
| 260MB | £1067              | £ 969  | £ 933  |
| 420MB | £1080              | £ 982  | £ 946  |
| 525MB | £1097              | £ 999  | £ 963  |
| 850MB | £1147              | £1049  | £1013  |
| 1GB   | £1234              | £1136  | £1100  |

### Other Configurations

Based on the above specification with 14" Monitor & your choice of hard disk drive & CPU.

|       | Intel486 Processor |        |        |
|-------|--------------------|--------|--------|
|       | DX4/100            | DX2/66 | DX2/50 |
| 260MB | £1225              | £1127  | £1091  |
| 420MB | £1238              | £1140  | £1104  |
| 525MB | £1255              | £1157  | £1121  |
| 850MB | £1305              | £1207  | £1171  |
| 1GB   | £1392              | £1294  | £1258  |

### Other Configurations

Based on the above specification with 14" Monitor & your choice of hard disk drive & CPU.

|       | PENTIUM® Processor |       |       |
|-------|--------------------|-------|-------|
|       | 100MHz             | 90MHz | 75MHz |
| 525MB | £1553              | £1453 | £1248 |
| 850MB | £1603              | £1503 | £1298 |
| 1GB   | £1690              | £1590 | £1385 |

The systems below come with SCSI HDDs

|        |       |       |       |
|--------|-------|-------|-------|
| 1.04GB | £1980 | £1880 | £1675 |
| 2.10GB | £2312 | £2212 | £2007 |

➤ Indicates differences between configurations

Delivery cost to most of UK for one system is £15.

£30 alteration charge is payable for any changes or upgrades to Special Configuration Systems. (These are the systems with the standard hard disk drive).

All prices exclude VAT @ 17.5%. E.&O.E.



Cert. No: 95/4556

ISO 9002 / EN 29002 (BS 5750 Pt 2)



## dan Multimedia

spreadsheet or give a command to your PC.

Add a dan Multimedia Kit to your dan personal computer to create exciting sound and CD Rom capability. It includes Encarta, Microsoft's acclaimed interactive encyclopedia, MS Works, MS Money and MS Scenes.

Price £181

The last year has seen one of the most exciting periods in PC development. The ready availability of advanced sound cards and CD-ROMs has engendered a new wave of software exploiting this new technology.

Multimedia applications on CD ROM can allow you to use an interactive encyclopedia, proofread a

Upgrades from Advanced speakers

Power Speakers (20W PMPO) £ 15

Hi-Fi Power Speakers (80W PMPO) £ 40

# go direct to dan





# dan's your man

If you want a straight, speedy PC for a sensible price



"Multimedia Systems" Computer Buyer, February '95

from £933

## Upgrades

for all dan Systems

### Video Card Upgrades

1MB PCI Stealth 64 DRAM Windows Accelerator Upgrade  
from 1MB Stealth 32 (Trio 32) £ 28

### Video Card Upgrades

from 1MB Stealth 64 DRAM

2MB PCI Stealth 64 DRAM Windows Accelerator £ 39  
2MB PCI Stealth 64 VRAM Windows Accelerator £120  
4MB PCI Stealth 64 VRAM Windows Accelerator £238

### Monitor Upgrades

15" Monitor Upgrade £ 71  
17" TRINITRON Monitor Upgrade from 14" model £387

All the dan 17" and 20" monitors are based on the SONY Trinitron tube for the ultimate screen quality and most relaxing display for your eyes.

### IDE HDD V.L. CACHE

Controller with 2MB Cache £130

### FAX - Modem add £99

Internal 14.4BPS Modem

This is your gateway to the outside world. You can now send and receive faxes from your PC as well as talk to millions of other computer users through services like CIX, Compuserve, Demomail (available on subscription). You can 'cruise' the INTERNET, find out information on almost any subject and even do some of your shopping.



dan Desktop Case

## Upgrade Kit



### Double Speed CD-ROM

SoundBlaster 16

Advanced Speakers

(10Watts PMPO)

Microphone

dan Software Bundle

(Encarta, Works, Money & Scenes)

### Multimedia PC Level MPC2



"Dan does it better!"

Over the last three years dan has repeated this on almost every machine that's come through the Labs. Take a pile of undistinguished components, put them in an unremarkable box and lo! Dans always have the edge. Our favourite monitor, dan's 15" monitor has full adjustment controls to keep your picture perfect.

**Conclusion:** Speedy and with lots of room for expansion. Dan's our number one." *Computer Buyer, RECOMMENDED (dan Premium 66MM), February '95*



"Direct seller, dan technology, has won numerous awards for both the quality of its machines and its after sales service. All-

ways well to the front technologically, the company builds all of its machines to order. The Norton SI benchtest gave an index of over 100, the only machine in the group to do so, emphasising the performance of the machine as a whole. For all-out pace, dan's premium system is definitely top dog. It runs all its multimedia titles effortlessly, with the result that it wins the 'OUR CHOICE' Award. If you are after the fastest PC on the block, with a good software bundle, then this is your machine." *WHAT Home Entertainment, OUR CHOICE (dan Premium 66MM), February '95*

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technology plc



The dan server offered the best all-round deal for speed, upgradability, price and on-site maintenance



Winner/Recommended, Expert Buyer: Fileservers Review, PC Direct, Nov'93

## Award Winning dan Servers

### Dan Servers for Novell and other Networks

When so much depends on one machine, it makes sense to go for the best in reliability and quality, as well as price and performance. In short, you have to choose the right supplier.

If you are looking for a complete Novell network, dan can provide the correct solution with its award winning file servers. For simple networks up to 20 users, choose the dan Server, an entry level file server which is based on ISA and PCI Local Bus technology.

More powerful networks on larger sites need to use the dan EISA Server with an EISA SCSI controller to cope with the most powerful applications.

Dan has introduced the new top of the range file server. The dantium PCI Server utilises the Pentium® Processor allowing the file server to cope in the most demanding of network environments.

We understand that your business will depend on your network; no one is more reliable than dan with its numerous magazine and reader awards.



ISA  
Intel 486  
PROCESSOR

### dan VL Novell Server

Excellent Network Server Performance

- 8 MB RAM with Parity
- 256KB Secondary Cache Memory
- • Intel 486 DX, DX2 or DX4 Processor
- • Free Slots: 1 VL or ISA & 2 ISA
- 512kB Video Graphics Card
- • IDE Hard Disk Controller or SCSI 16-bit HDD Controller - Adaptec 1542 with Adaptec drivers
- 14" Mono Low Radiation Monitor
- 1.44MB Floppy disk Drive
- Full Size Tower Case w/250W PSU
- • 1 Parallel & 2 Serial Ports
- 102 Key UK Keyboard
- Windows for Workgroups 3.11
- MS DOS 6.22
- 16-bit Ethernet Card (Novell NE 2000 compatible)



3COM Network Card available as an upgrade

Intel 486 Processor  
DX4/100 | DX2/66 | DX/50

|       |       |       |       |
|-------|-------|-------|-------|
| 420MB | £1037 | £ 939 | £1046 |
| 525MB | £1054 | £ 956 | £1063 |
| 850MB | £1104 | £1006 | £1113 |
| 1GB   | £1191 | £1093 | £1200 |

The systems below come with SCSI HDDs

|        |       |       |       |
|--------|-------|-------|-------|
| 1.04GB | £1499 | £1401 | £1508 |
| 2.10GB | £1831 | £1733 | £1840 |
| 4.10GB | £2272 | £2174 | £2281 |



EISA  
Intel 486  
PROCESSOR

### dan EISA Novell Server

Award Winning File Servers

- 8 MB RAM with Parity
- 256KB Secondary Cache Memory
- • Intel 486 DX-50 or DX2-66 Processor
- • Free Slots: 1 EISA or VL & 3 EISA/ISA
- 512kB Video Graphics Card
- • EISA SCSI 32-bit HDD Controller - Adaptec 2742 with Adaptec drivers for CD-ROMs and other SCSI devices.
- 14" Mono Low Radiation Monitor
- 1.44MB Floppy disk Drive
- Full Size Tower Case w/250W PSU
- • 1 Parallel & 2 Serial Ports
- 102 Key UK Keyboard
- Windows for Workgroups 3.11
- MS DOS 6.22
- 16-bit Ethernet Card (Novell NE 2000 compatible)

EISA Network Card available as an upgrade

Intel 486 Processor  
DX2/66 | DX/50

Not available with IDE drives

|        |      |       |       |
|--------|------|-------|-------|
| 1.04GB | SCSI | £1575 | £1682 |
| 2.10GB | SCSI | £1907 | £2014 |
| 4.10GB | SCSI | £2348 | £2455 |

Due to Novell's memory requirements, dan Servers with more than 1GB HDD or DAT Tape Streamer or CD-ROM should be upgraded to 16MB. Servers with 4.1GB HDD should be upgraded to 32MB.



PCI  
LOCAL BUS  
pentium  
PROCESSOR

### dantium PCI Novell Server

Servers with Pentium® Processor

- 8 MB RAM with Parity
- 256KB Secondary Cache Memory
- • 75, 90 or 100MHz PENTIUM® Processor
- • Free Slots: 1 PCI, 1 PCI or ISA & 2 ISA
- 512kB Video Graphics Card
- • PCI IDE HDD Controller or PCI SCSI 32-bit HDD Controller - Adaptec 2940 with Adaptec drivers
- 14" Mono Low Radiation Monitor
- 1.44MB Floppy disk Drive
- Full Size Tower Case w/250W PSU
- • 1 Parallel & 2 Fast Serial Ports
- 102 Key UK Keyboard
- Windows for Workgroups 3.11
- MS DOS 6.22
- 16-bit Ethernet Card (Novell NE 2000 compatible)

PCI Network Card available as an upgrade

PENTIUM® Processor  
100MHz | 90MHz | 75MHz

|       |       |       |       |
|-------|-------|-------|-------|
| 525MB | £1482 | £1382 | £1177 |
| 850MB | £1532 | £1432 | £1227 |
| 1GB   | £1619 | £1519 | £1314 |

The systems below come with SCSI HDDs

|        |       |       |       |
|--------|-------|-------|-------|
| 1.04GB | £1909 | £1809 | £1604 |
| 2.10GB | £2241 | £2141 | £1936 |
| 4.10GB | £2682 | £2582 | £2377 |

➤ Indicates differences between configurations

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Authorised Dealer

DISCOVER MEMORY FAULTS BEFORE IT'S TOO LATE

**MEMORY WITH PARITY**

WE DO NOT CUT CORNERS

Parity checking is a hardware technique that alerts you to hardware memory faults before potential damage of data can occur through memory corruption of your software.

Delivery cost to most of UK for one system is £15

All prices exclude VAT @ 17.5%.

E.&O.E.



"The dantium 90 machine may look like all other dans, but its turn of speed and software bundle gives it an edge.

We must put the dan at the top of the value league and it gets our recommendation for an excellent value Pentium PC".

RECOMMENDED, PC Plus, (dantium 90MM), October '94



"Yet again it seems dan technology has come up with a winner in the PC performance/price stakes. This is a system which any PC user would be proud to own. From its excellent keyboard and Microsoft mouse, to the 17" clear and stable monitor, the dantium/PCI66 exhibits quality all the way. Couple this to an extremely clean pair of heels throughout the Windows User benchmark tests and you have a great system." Windows User, BEST on TEST (dantium 66), Sept '94



"As users increasingly choose to buy their networks direct, another growth area has been the file server market, and direct vendors have met this need with high-power systems designed for the job. One such company is dan Technology, which you selected as your supplier of choice with its dan Novell Server DX150. PC DIRECT HITS AWARDS, PC Direct June '94



# go direct to dan





dan is recognised as a solid company with a good background.  
The dantium/PCi should be on your shortlist



Pentium Group Test, Highly Commended, dan dantium/PCI, PCW, April '94

from £ 939

## Upgrades for all dan Systems

### MultiMedia - CD ROM - Sound Cards

|   |      |
|---|------|
| Multimedia MPC 2 Upgrade Kit  | £181 |
| (Sound Blaster 16, 2x Speed CD-ROM, Advanced Speakers, Software Drivers, Mic Plus ENCARTA Encyclopedia, MS Works, Money & Scenes) |      |
| Sound Blaster 16/ Advanced Speakers/ Mic  | £ 78 |
| Sound Blaster AWE32 upgrade from SB16   | £156 |
| Sound Blaster 16 with ASP upgrade from SB16   | £ 20 |
| Power Speakers upgrade (20Watts PMPO)   | £ 15 |
| Hi-Fi Power Speakers upgrade (80Watts PMPO)   | £ 40 |
| 2x Speed AT CD-ROM with controller  | £ 92 |
| 2x Speed SCSI CD-ROM w/o controller   | £113 |
| 4x Speed AT CD-ROM upgrade from 2xSpeed CD-ROM  | £149 |

### Monitors (Low Radiation) Upgrades

|  |       |
|--|-------|
| 17" TRINITRON Monitor LR Upgrade from 14"      | £ 378 |
| 20" TRINITRON Monitor LR Upgrade from 14"      | £1147 |
| 15" XGA N/I Monitor LR Upgrade from 14"        | £ 71  |
| 14" Colour Monitor from 14" Mono (for Servers) | £ 94  |

### Network Cards

|  |      |
|--|------|
| 16-Bit Network Card Ethernet (Novell NE2000 Compatible - Thin Ethernet & Twisted Pair) | £ 22 |
| 16-Bit Network Card Ethernet (3 COM 509)   | £ 72 |
| 32-bit Ethernet Card for EISA Servers Upgrade  | £124 |
| 32-bit Ethernet Card for PCI Servers Upgrade   | £107 |

### Uninterruptible Power Supplies - UPS

|                             |       |
|-----------------------------|-------|
| 600VA UPS Off-Line from APC | £ 290 |
| Auto Shut down Software     | £ 58  |
| 600VA UPS ON-LINE           | £ 580 |
| Auto Shut down Software     | £ 89  |

### Tape Streamers (tapes not included)

|  |      |
|--|------|
| 250MB Floppy Tape Streamer with Software   | £109 |
| 250/500MB Tape Streamer Kit incl controller & SYTOS Software - 500MB via compression | £374 |
| All SCSI Tape Streamers require SCSI Controllers                                     |      |
| 500MB SCSI Tape Streamer for DOS and Windows with SYTOS Software                     | £471 |
| 2GB DAT Tape Streamer for Windows with Corel SCSI                                    | £674 |
| 2GB DAT Tape Streamer for Novell Server No Software. Use Novell's SBACKUP            | £607 |

### Case Upgrades from Desktop Case

|                 |      |
|-----------------|------|
| Mini Tower Case | £ 15 |
| Full Tower Case | £ 40 |

### Modem

|  |       |
|--|-------|
| Internal PC SuperGEM fax/Modem from Dataflex | £ 154 |
| Internal dan fax/Modem (V32 bis)             | £ 99  |

### Miscellaneous

|   |      |
|---|------|
| 1MB Additional Memory Upgrade             | £ 28 |
| 5.25" 1.2Mb Floppy Disk Drive             | £ 39 |
| Monitor & Keyboard Extension Leads (pair) | £ 20 |

|  |      |
|--|------|
| On-Site Maintenance First 12 Months (Buy later with form provided with system) | £ 30 |
|--|------|



PC Direct Readers 1993 & 1994 Awards



dan Full Tower Case

## Warranty

**LIFETIME GUARANTEE:** First year back-to-base parts & labour. Thereafter labour (excludes monitors and printers) and Hotline telephone support only. Optional 8-working hour response ON-SITE maintenance (£30 first year). **14 DAY MONEY BACK GUARANTEE IF NOT SATISFIED** (excludes printers & Software). dan technology Systems prices and specifications are subject to change without notice. All sales are subject to dan technology plc terms and conditions, a copy of which may be obtained on request. All trademarks acknowledged. Intel, Pentium and OverDrive are trademarks of Intel Corporation in the USA and other countries.

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## Elite Pro 7000 SERIES

### BENEFITS OF THE ELITE PRO

- ▲ 486 Upgradeable Processor Socket
- ▲ V.2 PCMCIA Slot
- ▲ Removeable Hard Disk Drive
- ▲ 3.5" (1.44Mb) Internal Floppy Disk Drive
- ▲ Award Winning Toshiba Display Mono/Dual Scan/TFT
- ▲ 4Mb Ram Expandable 16Mb
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- ▲ Autoswitching Mains Battery Charger
- ▲ Unique Modula Accessory Feature for Fax Modem, SCSI II Module
- ▲ External SVGA Monitor & Keyboard Port
- ▲ Slimline Design 28cm x 21cm x 4cm ▲ Weight 5.7lbs
- ▲ Carry Case with accessory pockets
- ▲ Simultaneous Display (not dual scan models)
- ▲ AT Expansion slot for expansion box



| Comes with 250Mb Hard Disk & 4Mb Ram |       |           |       |
|--------------------------------------|-------|-----------|-------|
| Processor                            | Mono  | Dual Scan | TFT   |
| 486SX-25                             | £849  | £1199     | £1599 |
| 486DX2-66                            | £999  | £1349     | £1749 |
| 486DX4-100                           | £1299 | £1649     | £1999 |

### BENEFITS OF THE POWERBOOK

- ▲ PGA Motherboard takes 3.3V or 5V CPU's ▲ 128KB External Cache
- ▲ 4Mb Ram Expandable to 32Mb Ram ▲ 32 bit Vesa Local Bus
- ▲ Removeable Upgradeable Hard Disk Drive
- ▲ 3.5" (1.44Mb) Floppy Disk Drive
- ▲ Mono, Dual Scan or TFT 10.4" Screen Options
- ▲ Microsoft Sound System
- ▲ 16 bit Sound Card, Sound blaster compatible
- ▲ Built-In speaker ▲ Built-In 25mm Trackball
- ▲ PCMCIA Type IV expansion slot
- ▲ External Microphone and speaker connections
- ▲ 1 Serial/1 Parallel Port ▲ Autoswitching mains Battery Charger
- ▲ External SVGA Colour Monitor Port & External Keyboard Port
- ▲ Docking Station Port ▲ 28cm (w) x 22cm (d) x 5cm (h)
- ▲ 2 NiMH Batteries with hot swap facility ▲ Carry Case

## Powerbook 8000 SERIES



| Comes with 250Mb Hard Disk & 4Mb Ram |       |           |       |
|--------------------------------------|-------|-----------|-------|
| Processor                            | Mono  | Dual Scan | TFT   |
| 486DX-33                             | £949  | £1299     | £1949 |
| 486DX2-66                            | £999  | £1349     | £1999 |
| 486DX4-75                            | £1099 | £1449     | £2099 |
| 486DX4-100                           | £1199 | £1549     | £2199 |
| PENTIUM 60                           | £1399 | £1749     | £2399 |
| PENTIUM 66                           | £1499 | £1849     | £2499 |

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- ▲ Built-In Microphone and amplifier
- ▲ VESA 32 bit Local Bus
- ▲ Removeable easily interchangeable Hard Disk
- ▲ 4Mb RAM Expandable to 64Mb
- ▲ 1xType III or 2xType II PCMCIA Slots
- ▲ 3.5" (1.44Mb) Floppy Disk Drive
- ▲ Upgradeable Mono/Dual Scan (10.4")/ TFT screen options
- ▲ Simultaneous LCD & CRT Display (1280 x 1024)
- ▲ External Keyboard Port and SVGA Monitor Port
- ▲ 2 Serial/1 Parallel Port/1 Midi Port
- ▲ Docking Station Port
- ▲ NiMH Battery with special RTG feature for extra life!
- ▲ Autoswitching mains Battery Charger
- ▲ Carry Case with accessory pockets
- ▲ External microphone and speaker ports
- ▲ MPEG live video option



Comes with 340Mb Hard Disk & 4Mb Ram & CD ROM

| Processor  | Dual Scan | TFT   |
|------------|-----------|-------|
| 486DX-33   | £1759     | £2359 |
| 486DX2-66  | £1799     | £2399 |
| 486DX4-75  | £1899     | £2499 |
| 486DX4-100 | £1999     | £2599 |



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- ✓ Our UFS (unique friendly service) ensures that our Sales Team recommends the best notebook for your need.

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| Upgrade to 340Mb Hard Disk £49 | Upgrade to 810Mb Hard Disk £399 | Mini Docking Station £55       |
| Upgrade to 420Mb Hard Disk £99 | Docking stations £299           | Range of PCMCIA products £CALL |

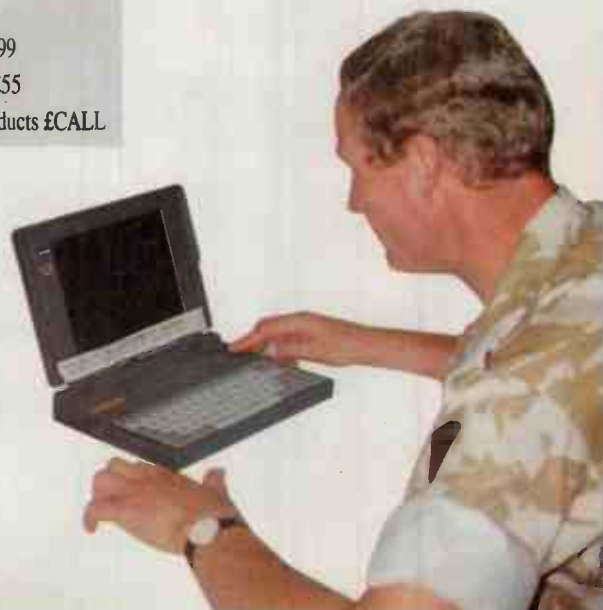


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- 4 x PCI and 3 x 16-bit slots
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- Built in enhanced IDE interface with fast serial port (16550)
- 540Mb IDE hard disk
- 8Mb RAM expandable to 128Mb
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- 1Mb accelerated PCI graphics card
- MS-DOS, Windows, mouse and keyboard

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\*Due to component price fluctuations call for latest prices

\* Notebook maintenance is back to base.

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810N DX/2 66 Dual Scan Colour  
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910N 50 10.4" Dual Scan Colour 340MB £2,115  
910N 75 10.4" Dual Scan Colour 510MB £2,665  
910N 75 10.4" TFT Colour 510MB £3,215 700MB £3,395

### PAYMENT

All major credit cards accepted, we NEVER charge a Credit Card before goods are despatched, corporate credit accounts are available on request and subject to approval.

ALL PRICES ARE SHOWN EXCLUSIVE OF VAT  
E&OE PRICES CORRECT AT TIME OF GOING TO PRESS



|   | 4MB Upgrade | 8MB Upgrade | 16MB Upgrade | Spare Battery | AC Adapter | Car Adapter | Port Replicator | Docking Station |
|---|-------------|-------------|--------------|---------------|------------|-------------|-----------------|-----------------|
| <b>AST</b>  |             |             |              |               |            |             |                 |                 |
| ASCENTIA 800/810  | £170        | £440        | £925         | £85           | £55        | £55         | –               | –               |
| ASCENTIA 900/910  | £175        | £350        | £700         | £145          | £40        | £75         | £65             | £295            |
| <b>IBM</b>  |             |             |              |               |            |             |                 |                 |
| THINKPAD 340  | £185        | £368        | –            | £45           | £40        | –           | –               | –               |
| THINKPAD 360  | £185        | £368        | £922         | £95           | £53        | £48         | £198 (I)        | £536 (I)        |
| THINKPAD 755 – DRAM   | £203        | £405        | £1,031       | £135          | £53        | £48         | £72 (II)        | £500 (II)       |
| <b>NEC</b>  |             |             |              |               |            |             |                 |                 |
| VERSA 'S'   | £185        | £360        | –            | £75           | £65        | –           | –               | –               |
| VERSA 'E'/'V'   | £185        | £360        | £790         | £135          | £65        | £40         | £80             | £425            |
| VERSA 'M'/'P'   | £185        | £360        | £790         | £145          | £75        | £40         | £80             | £425            |
| <b>PANASONIC</b>  |             |             |              |               |            |             |                 |                 |
| CF41  | £229        | £440        | £899         | £95           | £115       | –           | –               | £399            |
| <b>TOSHIBA</b>  |             |             |              |               |            |             |                 |                 |
| T19xx/46xx/47xx/48xx  | £170        | £298        | £1,339       | £94           | £56        | –           | –               | £374 (IV)       |
| T24xx   | £192        | £340        | £1,148       | £94           | £48        | –           | £140            | –               |
| T34xx/36xx  | £192        | £340        | £1,148       | £175          | £48        | –           | –               | –               |
| <b>TEXAS INSTRUMENTS</b>  |             |             |              |               |            |             |                 |                 |
| TM4000 'E'  | £190        | –           | £999         | £65           | £99        | –           | –               | £595            |
| TM4000 'M'  | £185        | –           | £999         | £99           | £105       | –           | –               | –               |
| CD ROM MULTI MEDIA CHASSIS AVAILABLE FOR: IBM THINKPAD 360/755 CALL FOR OPTIONS<br>TEXAS INST. 'M' £595<br>NEC VERSA E/V/M/P £555 |             |             |              |               |            |             |                 |                 |



#### IBM THINKPAD 755/755CE/755CD (Shown)

##### IBM THINKPAD FULL RANGE AVAILABLE

|   |        |        |
|---|--------|--------|
| T/P 755 50 Dual Scan Colour 170MB/340MB | £2,255 | £2,405 |
| T/P 755 50 TFT Colour 170MB/340MB       | £2,630 | £2,775 |
| T/P 755 75 Dual Scan Colour 340MB/540MB | £3,010 | £3,307 |
| T/P 755 75 TFT Colour 170MB/340MB       | £3,233 | £3,385 |
| T/P 755 75 TFT Colour 540MB/810MB       | £3,684 | £4,135 |
| T/P 755CE 100 TFT Colour 340MB/540MB    | £4,490 | £4,742 |
| T/P 755CE 100 TFT Colour 810MB          | £5,211 |        |
| T/P 755CD 100 TFT Colour 540MB/810MB    | £5,463 | £5,915 |

|  |        |        |
|--|--------|--------|
| <b>IBM THINKPAD 360/340</b>              |        |        |
| <b>IBM THINKPAD FULL RANGE AVAILABLE</b> |        |        |
| T/P 340 (not shown) Mono 125MB           | £ 899  |        |
| T/P 360 33 Mono 170MB/340MB              | £1,090 | £1,245 |
| T/P 360 33 TFT Colour 170MB/340MB        | £1,545 | £1,665 |
| T/P 360 50 Dual Scan Colour 170MB/340MB  | £1,950 | £2,095 |
| T/P 360 50 TFT Colour 170MB/340MB        | £1,950 | £2,095 |



#### TEXAS INSTRUMENTS 'M' SERIES

##### Power Users Notebook and Multimedia Ready Presentation System

- Optional 12cm CD-ROM Chassis
- Intel 486 Processors – 50, 75, and 100 MHz
- 9.5" Dual Scan Colour OR 8.4"/9.5" TFT Colour with 1MB Video RAM and Built-In Graphics Accelerator
- 4MB RAM Standard, Upgradeable to 20MB (See Chart)
- 200MB/340MB/455MB/520MB Hard Disk Drives
- Built-In – Full 16 Bit Sound/Internal Stereo Speakers/ Fast SCSI II
- Two PC-Card (PCMCIA) Type II Slots (Or One Type III)
- 'The Point' Internal Pointing Device
- Ports – SVGA/16 Bit Midi/ Audio In/Audio Out/Fast SCSI II/ Microphone/Serial/Parallel/PS/2 Mouse/PS/2 Keyboard

- Complete With – NiMH Battery (3 to 5 Hours)/AC Adapter & Battery Charger/Microsoft Dos and Windows 3.11 Plus Utilities

|  |        |        |
|--|--------|--------|
| TI 'M' 25 TFT Colour 200MB             | £1,575 |        |
| TI 'M' 50 Dual Scan Colour 200MB/340MB | £1,649 | £1,899 |
| TI 'M' 50 TFT Colour 340MB/455MB       | £2,199 | £2,449 |
| TI 'M' 75 Dual Scan Colour 455MB       | £2,449 |        |
| TI 'M' 75 TFT Colour 340MB/455MB       | £2,799 | £2,899 |
| TI 'M' 100 TFT Colour 525MB            | £3,699 |        |

See Panel for Options and Upgrades





# ER



## SHARP PC8660

- Big Screen...Big Disk...Knock-Out Price From Sharp - The World Leader in TFT Displays**
- Intel 486 DX/2 50 MHz Processor
  - Enormous 9.5" TFT Colour Display with Local Bus Accelerated Graphics and 1MB Video RAM
  - 4MB RAM Standard Upgradeable to 20MB with 320MB HDD
  - PC-Card (PCMCIA) Type II Slot
  - Superb Removable Front Mounted Track Ball
  - Ports - SVGA/Serial/Parallel/PS/2 Port/Port Replicator
  - Complete with - NiMH Battery (Up to 3 Hours)/AC Adapter & Battery Charger/Microsoft Dos 6.21 and Windows 3.11
  - 12 Month SharpServ Warranty

PC8660 DX/2 50 9.5" TFT Colour 320MB **£1,999**



## NEC VERSA 'S'

- Why Compromise with a Sub-Note, when the Versa 'S' Weighs in at only 4lbs for £845**
- Intel 486 Processors - 33 and 50 MHz
  - 9.5" Mono, 9.5" Dual Scan Colour or 9.5" TFT Colour with Video RAM and Built-In Graphics Accelerator
  - 4MB RAM Standard Upgradeable to 12MB, 210MB/250MB HDD
  - Two PC-Card (PCMCIA) Type II Slots (or one Type III)
  - NEC 'SurePoint' Internal Pointing Device
  - Ports - SVGA/Serial/Parallel/PS/2 Mouse & Keyboard
  - Complete with - NiMH Battery (Up to 4 hours)/AC Adapter & Battery Charger/Microsoft Dos and Windows 3.1/Full Media Pack

Versa 'S' i486 33 Mono 210MB **£ 845**  
 Versa 'S' i486 33 Dual Scan Colour 210MB **£1,065**  
 Versa 'S' i486 33 TFT Colour 210MB **£1,539**  
 Versa 'S' i486 50 TFT Colour 250MB **£1,719**



## NEC VERSA 'V'

- The Truly Versatile Notebook Computer NEC - The Leader In Modular Design Technology**
- Optional 12cm CD-ROM Multimedia Chassis
  - Intel 486 Processor - 50 MHz
  - 9.5" Dual Scan Colour or 9.5" TFT Colour with 1MB Video RAM and Built-In Graphics Accelerator
  - 4MB RAM Standard Upgradeable to 36MB
  - Optional Port Replicator and Docking Station for Genuine Desktop Replacement
  - Removable and Easily Upgradeable (Up to 810MB) 250MB/340MB Hard Disk Drives
  - Two PC-Card (PCMCIA) Type II Slots (Or One Type III)
  - Front Mounted 'Versa Track' Trackball
  - Ports - SVGA/Serial/Parallel/PS/2 Port/Docking Station
  - NiMH Battery (Up to 3 Hours)/Second Battery Option (Remove FDD) for twice the battery life
  - Complete with - AC Adapter & Battery Charger/Microsoft Dos and Windows 3.1/Full Media Pack

Versa 'V' i486 50 Dual Scan Colour 250MB **£1,769**  
 Versa 'V' i486 50 TFT Colour 340MB **£2,299**



## NEC VERSA 'M' and 'P' SERIES

- Massive Power and the First Ever SVGA TFT Notebook Computer with all of the Features of the 'V' Plus:**
- Intel DX/4 and Pentium Processors - DX/4 75, DX/4 100, Pentium 75
  - The Widest Choice of the best Colour Displays Ever

| Model     | Screen Type | Max Colours | Max Res   |
|-----------|-------------|-------------|-----------|
| 'M' 75 D  | DUAL SCAN   | 256         | 640 X 480 |
| 'M' 75 C  | TFT         | 4,096       | 640 x 480 |
| 'M' 100 C | TFT         | 4,096       | 640 x 480 |
| 'M' 100 T | TFT         | 16,700,000  | 640 x 480 |
| 'M' 100 S | TFT         | 256         | 800 x 600 |
| 'P' 75 C  | TFT         | 4,096       | 640 x 480 |
| 'P' 75 S  | TFT         | 256         | 800 x 600 |

- 8MB RAM Standard Upgradeable to 40MB
- Built-In 16 Bit Stereo Sound
- Removable and Easily Upgradeable 340MB/540MB/810MB HDD
- Ports (See 'V') Plus - Line In/Line Out
- Complete with - NiMH Battery (Up to 4 Hours)/Secondary Battery Option (Remove FDD) for twice the battery life/AC Adapter & Battery Charger/Microsoft Dos and Windows 3.1/ Full Media Pack

Versa 'M' 75 D Dual Scan Colour 340MB **£2,699**  
 Versa 'M' 75 C TFT Colour 540MB **£3,549**  
 Versa 'M' 100 C TFT Colour 540MB **£3,799**  
 Versa 'M' 100 S TFT Colour 540MB **£4,099**  
 Versa 'M' 100 T TFT Colour 540MB **£4,049**  
 Versa 'P' 75 C TFT Colour 810MB **£4,579**  
 Versa 'P' 75 S TFT Colour 810MB **£4,879**



## SHARP PC8900

- Featuring 10.4" TFT, Glide Point Mouse and Multimedia Ready, The Next Generation from Sharp - The World Leader in TFT Displays.**
- Intel 486 DX/4 75 MHz Processor
  - Enormous 10.4" TFT Colour Display with Local Bus Accelerated Graphics and 1MB Video RAM
  - 8MB RAM Standard Upgradeable to 32MB with 320MB HDD
  - 16 Bit Stereo Sound with Built-In Speakers
  - IrDA Infra-Red Wireless Data Transfer Built-In
  - Two PC-Card (PCMCIA) Type II Slots, or One Type III
  - Glide Point and PC Windows, The Ultimate Combination
  - Ports - SVGA/Serial/Parallel/PS/2 Port/Line In/Line Out/Optional Port Replicator with SCSI II & Two Extra PCMCIA Ports
  - NiMH Battery (Up to 3 hours)/Second Battery Option (Remove FDD) for twice the battery life
  - Complete with - AC Adapter & Battery Charger/Microsoft Dos and Windows
  - 12 Month SharpServ Warranty

PC8900 DX/4 75 10.4" TFT Colour 320MB **£3,195**

## TOSHIBA T4800/T4850 (Shown)/T4900CT (Shown)

### FULL TOSHIBA RANGE AVAILABLE

- Intel DX/4 & Pentium Processors - 75 MHz
- T4800 - 9.5" TFT Colour/T4850 and T4900CT Feature 10.4" TFT 65,000' Colour Display, all with 1MB Video RAM and Built-In Graphics Accelerator
- 8MB RAM Upgradeable to 40MB, 500MB and 810MB HDD
- Optional Docking Station - Desk Station IV
- Two PC-Card (PCMCIA) Type II Slots (Or One Type III)
- Side Mounted Ballpoint Mouse or Toshiba MousePoint Device
- Microsoft Sound System Software with built-in Mic. & Speaker
- Ports - SVGA/Serial/Parallel/PS/2 Port/Docking Station
- Complete with - NiMH Battery (Up to 3.5 hours)/AC Adapter & Battery Charger/Microsoft Dos 6.2 and Windows 3.11



T4800 CT 75 TFT 9.5" Colour 500MB **£3,149**  
 T4850 CT 75 TFT 10.4" Colour 500MB **£4,679**  
 T4900 CT 75 TFT 10.4" Colour 810MB **£4,647**

ALL OTHER MODELS AVAILABLE.

## COMMUNICATE PC-CARD (PCMCIA) MODEMS

### Made In the UK - Best of Breed!

2496/Fax **£199**  
 1440/Fax **£349**  
 Cellular 1440/Fax **£499**  
 NEW 2880/Fax **£469**  
 NEW Cellular 2880/Fax **£569**



## PANASONIC CF-41

### Internal 12cm CD-ROM, Big Screen, Fast Processors - The Power to Present

- Intel 486 Processors - DX/2-50 and DX/4-100 MHz
- 10.4" Dual Scan Colour or 10.4" TFT Colour with 1MB Video RAM and 65,536 Colours (TFT only)
- 4MB RAM Standard Upgradeable to 32MB
- 240MB/260MB/450MB Hard Disk Drives
- Built-In - Full 16 Bit Sound and Two Speakers
- Two PC-Card (PCMCIA) Type II Slots (or One Type III)
- Big 19mm Internal Trackball
- Ports - SVGA/Audio In/Audio Out/Microphone/Serial/Parallel/PS/2 Mouse & Keyboard/Docking Station
- Complete with - NiMH Battery (Up to 3 Hours)/AC Adapter & Battery Charger/Microsoft Dos and Windows 3.1 Plus Utilities

CF-41 DX/2 50 Dual Scan Colour 240MB **£2,649**  
 CF-41 DX/2 50 TFT Colour 260MB **£3,399**  
 CF-41 DX/4 100 TFT Colour 450MB **£4,199**



See Panel for Options and Upgrades



## GREY CELL PC-CARD (PCMCIA) ETHERNET

### Made in the UK - Best of Breed!

- 100% NE2000 Compatible - Guaranteed
- Automatic Cable Type Detection
- CardDealer Software - Automatic Configuration
- Money Back Guarantee of Compatibility
- PC-Card Fibre Optic Solutions also available

10 Base 2 (BNC)/10 Base T (UTP)

Combo Card **£189**

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# LAPLAND

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# Dakota

## Dakota Computer Solutions

# Dakota

### DAKOTA KEYBOARD, MONITOR & MOUSE SWITCHES

Our Dakota Keyboard, Monitor and Mouse switches allows you to control a number of computers with **1 Keyboard, Monitor and Mouse.**

- 2, 4, 8 or 12 Computers controlled from 1 Keyboard, Monitor and/or Mouse
- VGA and SVGA Compatible (Up to 1280 x 1024)
- Works with AT/XT & PS/2 Keyboards
- Supports DOS, Windows, Windows NT and OS/2

**2 Device Option £29**

2 Computers to 1 Keyboard & Monitor

**4 Device Option £49**

4 Computers to 1 Keyboard & Monitor

**8 Device Option £179**

8 Computers to 1 Keyboard & Monitor

**12 Device Option £249**

12 Computers to 1 Keyboard & Monitor

**2 Device Option £49**

2 Computers to 1 Keyboard, Monitor & Mouse

**4 Device Option £69**

4 Computers to 1 Keyboard, Monitor & Mouse

**12 Device Option £329**

12 Computers to 1 Keyboard, Monitor & Mouse

### SERVEVIEW - KEYBOARD, MONITOR & MOUSE - AUTOMATIC BOOTUP

Our ServeView automatic switch is the ultimate in computer switching devices. Fully expandable, it allows for automatic booting for both keyboards and mice on AT and/or PS/2 computers. A must for anyone where reliability is of prime importance.

- 4, 8, 12 or 16 Computers controlled from 1 Keyboard, Monitor and Mouse
- VGA, SVGA & EGA Compatible (Up to 1280 x 1024)
- Automatic booting with AT/XT & PS/2 Keyboards
- Automatic booting on Serial & PS/2 Mice
- Scan mode automatically switches between CPUs
- Num Lock, Scroll Lock & Caps Lock for all keyboards
- Supports upto 256 computers
- All commands can be done directly from the keyboard
- Non-Volatile memory stores configuration setup

**New Products**

**4 Device Option**

4 CPUs to 1 Keyboard, Monitor & Mouse

**£595**

**8 Device Option**

8 CPUs to 1 Keyboard, Monitor & Mouse

**£995**

**12 Device Option**

12 CPUs to 1 Keyboard, Monitor & Mouse

**£1395**

**16 Device Option**

16 CPUs to 1 Keyboard, Monitor & Mouse

**£1795**

**6 Device - Non PS/2 Type**

6 CPUs (non-PS/2) to 1 Keyboard, Monitor & Mouse

**£395**

### MULTI-ACCESS PC SHARERS

Dakota Multi-Access PC Sharers enable one computer to be shared by up to **4 Keyboards, Monitors and Serial Mice.**

- Extend up to 75 metres away
- VGA & SVGA Compatible
- Up to 1280 x 1024 resolution
- Supports DOS, Windows, OS/2 & NT

**2 Site Option**

2 Keyboards & 2 Monitors to 1 Computer

**£99**

**2 Site Option**

2 Keyboards, 2 Monitors & 2 Mice to 1 Computer

**£129**

**4 Site Option**

4 Keyboards, 4 Monitors & 4 Mice to 1 Computer

**£199**

### MULTI-DISPLAY DEVICES

Dakota Monitor Splitters allow up to **16 Monitors** to display identical images. Perfect for exhibitions, training, presentations and demonstrations.

- Extend up to 75 metres away
- VGA & SVGA Compatible
- Supports up to 1280 x 1024
- Display on up to 16 Monitors
- Supports DOS, Windows, OS/2 and Windows NT

**2 Monitors**

**£149**

**4 Monitors**

**£199**

**8 Monitors**

**£299**

**16 Monitors**

**£399**

### MONITOR & KEYBOARD EXTENDERS

Dakota Extenders enable Monitors and/or Keyboards to be used up to **150 metres** for Monitors and **75 metres** for Keyboards.

Monitor Extender **£79** Keyboard Extender **£79**

### SPECIAL OFFERS - CABLES

With any purchase get the following items at a very special price! All of our Cables are fully moulded. We stock a complete range of cables for your convenience. **Call Now!!**

- Parallel Printer Cables 1.8 metre **£1.00**
- Modem Cables 3.0 metre 9F - 25M **£2.50**
- Modem Cables 1.8 metre moulded 25F-25M **£1.50**
- Modem Cables 3.0 metre 25F - 25M **£2.50**
- Data Transfer Parallel Cables 5.0 metre **£6.50**  
Works with Laplink™ and Interlink.

### PRINTER NET PLUS - PRINTER SHARING

Connect up to **32 PCs** to **8 Parallel Printers.**

Our Printer Net+ printer sharing devices allows you to connect 32 PCs to 8 printers up to 400m away using cheap telephone type cable. Simultaneous printing and data transfer between PCs.

Starter Kit **£149** Transmitters **£49** Receivers **£49**  
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### NETWORKING PRODUCTS



**NE2000 Compatible Ethernet Card. Ideal for Novell, IPX, ODI, NDIS & Windows Network Card**  
Plugs directly into a Parallel Port, has a printer pass through & does not require an external power supply. **£35**  
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Not all PCs can stand...



# ...a close up

When the photographer moves in for a real close-up, only the very best models stand up to the scrutiny of the camera's lens and reveal their true quality.

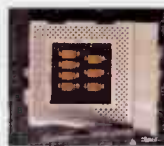
In the PC industry, it's only the top models who wear the Gateway 2000® brand. And, the closer you look at Gateway, the easier it is to see why we're the value-for-money leaders in America – and in the UK. True value, that means you always get the most for your money – the very best products and services and the latest technology for the lowest possible cost. That's what Gateway means by "value". It's our founding philosophy and a promise we'll never break. After all, our slogan is "You've got a friend in the business" – and a friend wouldn't sell you something you're not entirely pleased with, now would they?



So take a close-up look at Gateway. Compare our prices, quality, performance and service – Gateway 2000 is one of the few who can really stand up to the test.

## Introducing the P5-120 Elite – it's so fast and feature-packed, you'll hardly believe your eyes!

Gateway's new P5-120 Elite is the final word in power and performance. We're always one of the first to market with the very latest technology and the P5-120 bears testimony to our promise. This truly stunning system is based on Intel's



latest, fastest CPU ever – the 120MHz Pentium® processor.

With 16MB EDO RAM, the very latest 'pipeline burst' cache technology, quad-speed CD-ROM with a triple-deck CD changer and a huge 1GB IDE hard drive with PCI enhanced IDE interface, ATI Mach 64 graphics with 2MB VRAM, the best speakers in the business and a 17" Vivitron™ monitor, the P5-120 from Gateway sets a new standard in personal computing. And at £2,599, it's a standard others will find hard to match.

Lights, camera, action – with Gateway 2000 the first take is a RAP – every time!



"You've got a friend in the business."

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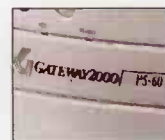




No Matter How Close  
You Look, The Quality  
Shines Through At

# Gateway 2000

We only sell fully equipped, high-performance computers, built with the finest components. We'll never compromise on quality by fitting inferior components or by stripping a machine down to reach what appears to be an appealing price. So when you see our competitors offering a Pentium processor-based system at a price you can hardly believe, take a closer look and see what you'll really get for your money!



Then focus on our Pentium processor-based systems, there's so much depth of field you'll find it hard to choose the one that's best suited to your needs. And if you can't find one – no matter! Just call us and we'll be happy to build a system specially for you.

## CD or not CD!

Gateway 2000 were the first PC company to introduce

CD-ROMs as standard on our Pentium processor-based systems

and now we've introduced the quad-speed CD-ROM on

all our systems – installing the latest software applications has never been so fast, or so easy!

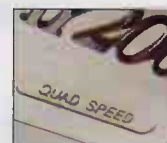
As the name implies, this drive is four times faster than a standard-speed CD-ROM, with a throughput of 600KB per second, it's faster than the shutter speed on a Nikon F2!

And remember it's only with a quad-speed CD-ROM that you can get full-screen, full-motion video from a CD – without the jerks. Our quad-speed CD-ROM has a motorised tray and is ATAPI compliant, all ready for Windows '95.



Our latest top-of-the-range P5-120 Elite features a Sanyo® quad-speed CD-ROM with triple-deck CD changer so three CDs can be loaded together and played sequentially. This feature is now available as an optional upgrade on all our Pentium processor-based systems.

Best of all, Gateway brings you all this technology at unbelievable prices. We have a P5-90 Premium system for £1,999 and our P5-75 Multimedia model with the very latest EDO memory is only £1,499 – it's no wonder we're the price-performance leaders in the industry.



pentium  
PROCESSOR



0 8 0 0 1 7 2 0 0 0



## Getting To The Heart Of The Matter

Some models might flinch at the idea of exposing themselves, but there's no hiding from the truth when you're stripped of all your outer garments! No false modesty at Gateway. We're proud to reveal ourselves and show you what's at the heart of our systems – a motherboard built with pride, built with care and built with the future in mind.



Take this Aladdin system board for example, with Triton chip set and EDO memory, it's characteristic of our P5-75 and P5-120 systems. Future-proofed with three PCI slots, two ISA slots plus one PCI/ISA, expandability and upgradability are inherent – and because our motherboards all use genuine Intel® processors, they are all Intel verified for upgradability.

PCI bus? You know it's better and faster than ISA, that's why it's there. RAM and cache? Gateway always gives you plenty, so you won't find yourself short when you're trying to work with today's applications. And the very latest pipeline burst technology – standard in our P5-120 – gives you processing speed and flexibility previously unheard of. In the burst mode data can be transferred in



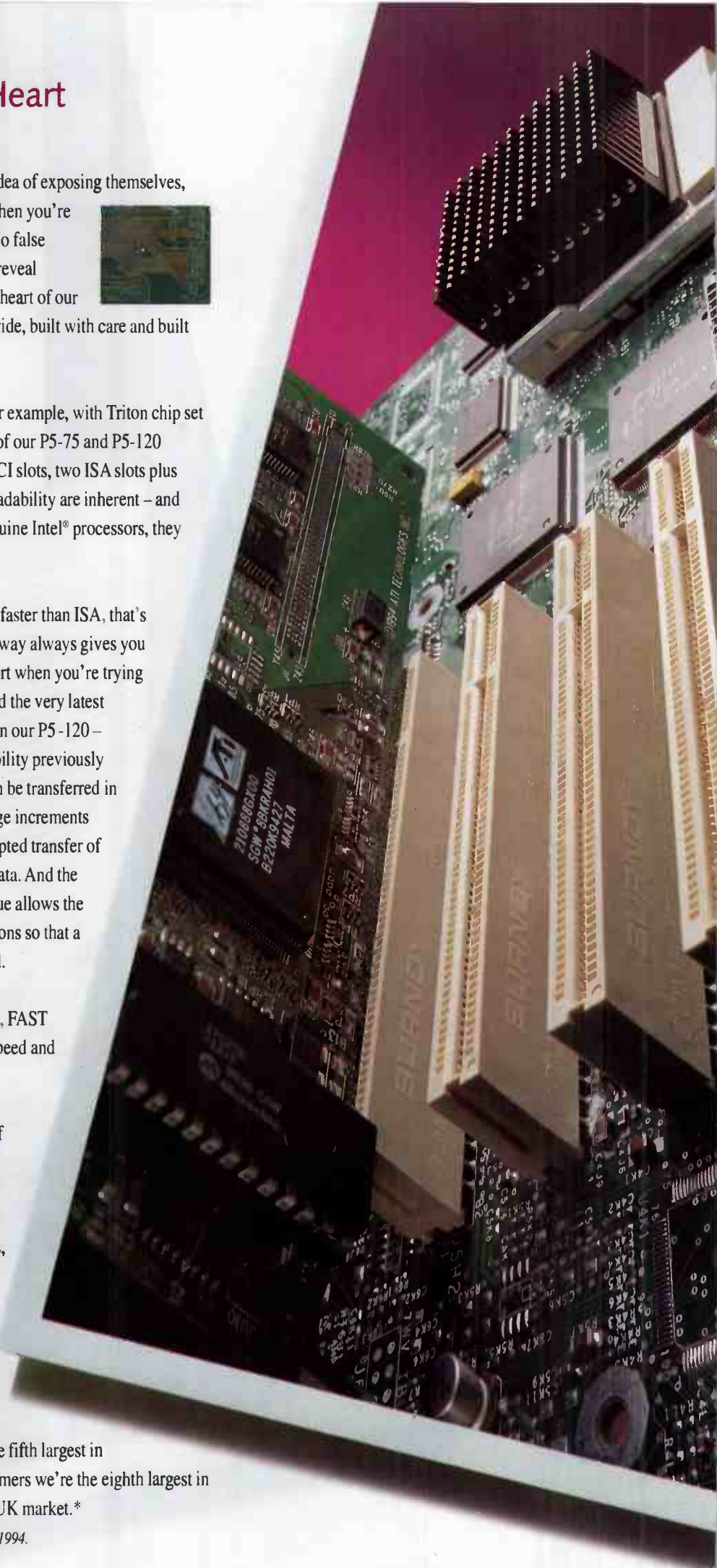
1, 2, 4, 8 or full page increments allowing uninterrupted transfer of large amounts of data. And the pipelining technique allows the SDRAM to overlap multiple instructions so that a continuous stream of data is produced.

Hard drives? Well they're BIG, FAST and very reliable, giving you all the speed and efficiency you'll need.

Take a close-up look at the heart of Gateway systems – we've nothing to hide, in fact, with so much physical space around our components, giving you room for expansion and upgrades, we couldn't hide anything even if we wanted to!

With so much quality and value-for-money it's no wonder Gateway 2000, America's number one direct-sell PC manufacturer, is the fifth largest in the world and thanks to our UK customers we're the eighth largest in the UK – after just over a year in the UK market.\*

\*International Data Corporation, November 1994.

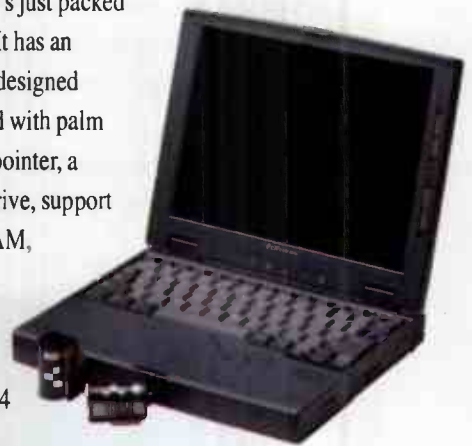


## The Gateway 2000 Liberty™ – Closer To Perfection, Whichever Way You Look At It!

Photographer, accountant, lawyer, surveyor,  
whatever your profession the  
Liberty gives you the freedom  
to work anywhere – without  
compromise or hindrance. It's  
like having a 100MHz desktop inside a package no  
bigger than a book and, wow! Is it fast?



At just 4.2 pounds (1.9kg) Gateway's Liberty is the  
world's first notebook of this weight with a 10.4-inch,  
dual-scan, STN colour display  
screen. And it's just packed  
with features. It has an  
ergonomically designed  
78-key keyboard with palm  
rest and built-in pointer, a  
removable hard drive, support  
for up to 24MB RAM,  
excellent power  
management for  
extra battery life and  
an Intel® 100MHz DX4  
processor. And, almost  
unbelievably, the Liberty measures only 10 inches by  
8 inches by 1.6 inches (25.4 x 20.3 x 4.1 cms).



### Impressed? Just wait 'til you hear the rest!

The very latest infrared connectivity lets you swap files, download  
data and go straight to print – without any wires! Then there are two  
PCMCIA Type II slots (or one Type III slot) for add-in cards like  
modems and network cards, plus a serial port, a parallel port, a PS/2-  
style port for an external keyboard or mouse and a VGA port for an



external monitor. There's even a "hot-key" so you  
can choose to use either the Liberty's display, an  
external monitor or, wait for it, both at the same time!



0 8 0 0 1 7 2 0 0 0

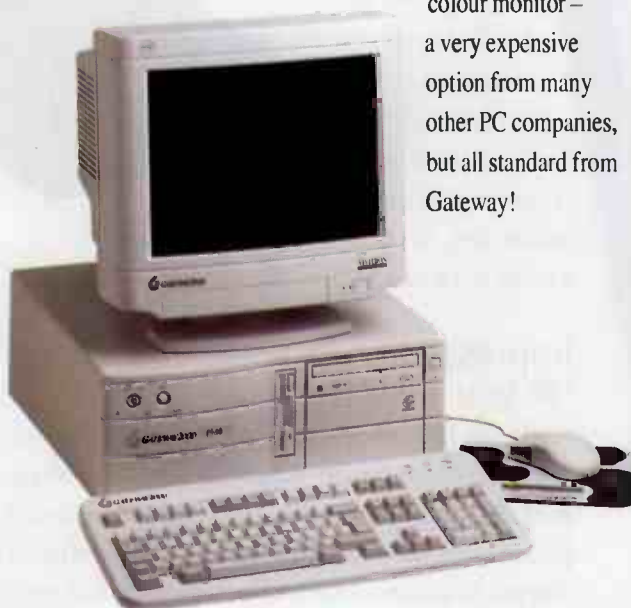


## Vivitron Monitors – Quality Images From The Image Of Quality

Vivitron™ monitors, featuring Sony® Trinitron® tube technology, are a feature of all Gateway Pentium® processor-based systems giving brighter, crisper, richer colour and focus so sharp you won't need to open the lens to check every detail!

Our standard high-performance video system includes an ATI Mach 64 video card on the PCI local bus and a 17" Vivitron

colour monitor – a very expensive option from many other PC companies, but all standard from Gateway!



Now take a close look at our P5-90 Premium system, it's 15" Vivitron monitor gives you the best "view-finder" in the business. With an Intel® 90MHz Pentium processor, 16MB RAM, 256KB cache, quad-speed CD-ROM, a massive 1GB IDE hard drive with PCI enhanced IDE interface and ATI Mach 64 graphics with 2MB DRAM, premium speakers and sound card – would we give you anything less for only £1,999?

It's all part of our commitment to bring you the best products and the best value-for-money, however close you look.

## The Exciting World Of Multimedia Is Close At Hand

Whichever way you look at it, 10 x 8, 5 x 4, 2 1/4 or 35mm, no one is doing more to bring the exciting world of multimedia into the reach of everyone. From the entry level P4D-661 Family PC™ to our top of the range P5-120 Elite, these models have everything you need to start exploring and enjoying multimedia the minute you unpack your system.

Introduce your family to multimedia with our Family PC, it's the lowest priced model in our family of multimedia systems. It comes with software for all ages including; Microsoft® Encarta, the dynamic multimedia encyclopaedia, Works, Money, Publisher, Golf and Musical Instruments – in fact something for all the family from aiding and encouraging homework to keeping household accounts and enjoying the fun of video games. For the

professional user, our P5 Executive and Elite models come with Microsoft Office Professional™, that



includes Word, Excel, PowerPoint® and Access® – everything for the home office or to make the office seem more like home!

All Gateway Multimedia systems have a built-in quad-speed CD-ROM drive, giving video



quality that will match the expectation of the most discerning TV viewer. And the latest feature from

Gateway is the triple-deck CD changer, standard on the P5-120 and an optional upgrade on our other multimedia systems, this lets you load three CDs at once and then play them sequentially at will.

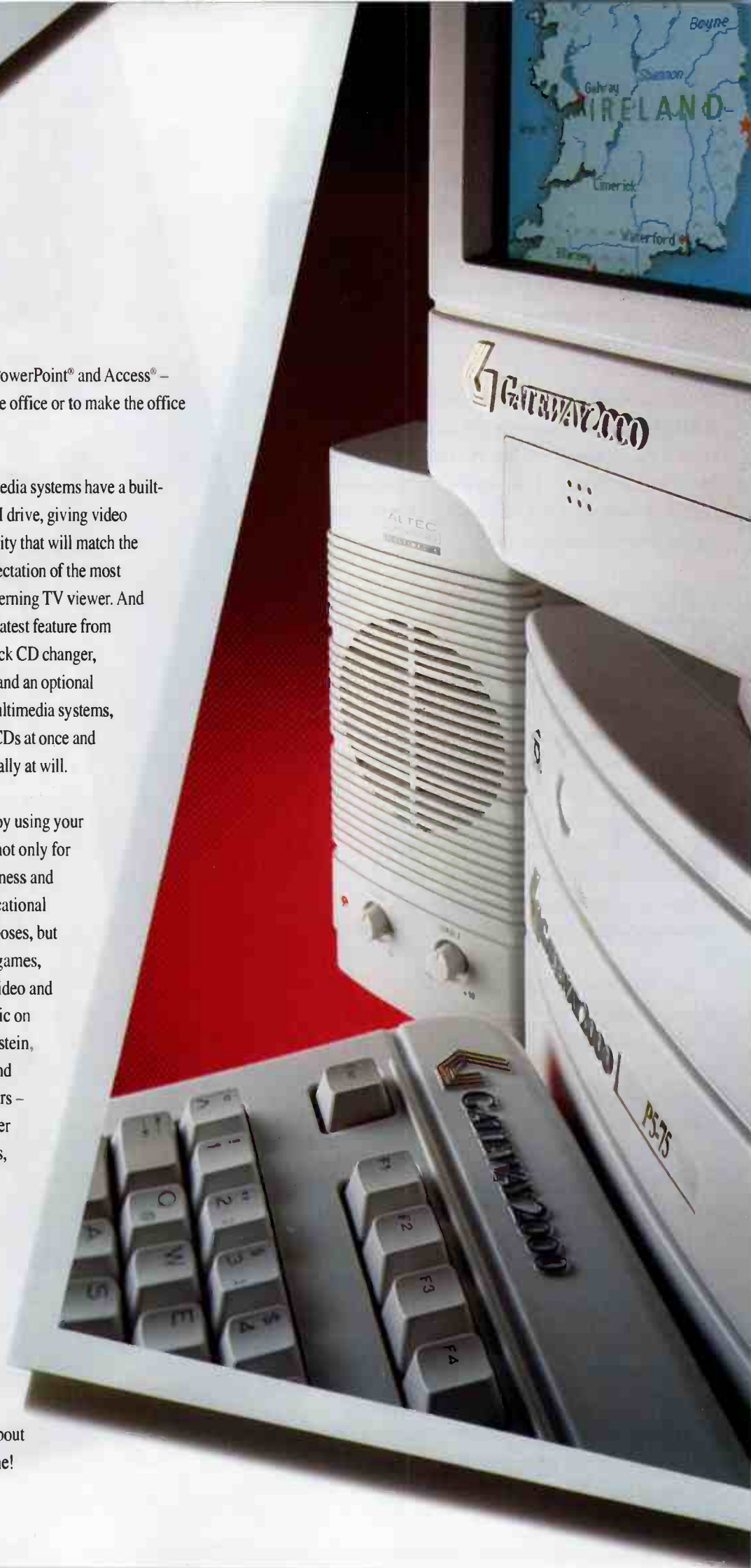
So now you can enjoy using your



PC not only for business and educational purposes, but

also for your favourite games, programs, animation, video and all your best-loved music on CD. Beethoven to Bernstein, Reggae to Rap, the sound quality from our speakers – with separate sub-woofer on the high-end systems, will blow the mind of even the most demanding hi-fi enthusiast.

Gateway's super-value multimedia systems could become such a habit, you'll forget all about photography as a pastime!





## We've Developed Service That Stands Up To The Closest Scrutiny

At Gateway, we turn the camera on you, because to us our customers are our top models. Gateway's friendly and expert sales and customer services staff will be pleased to answer your questions and assist with your order. And our service continues for as long as you own a Gateway system.



### 30-day money-back guarantee

If for any reason you are not entirely satisfied with your Gateway 2000 purchase, we'll happily refund all but the shipping charges when you return your merchandise within 30 days.

### Three-year warranty and on-site service

All components of our desktop and tower PCs are backed for a full three years (portables include a one-year factory service warranty), with one-year on-site service provided at our discretion.

### Lifetime freephone technical support

You are welcome to use our freephone technical support hotline for the life of your Gateway system. No matter what the problem with hardware or software we've supplied, we'll always try to help you.

### Convenient payment options

We offer several convenient ways to pay for your new Gateway 2000 PC, please call and ask for details.

Whether you're a corporate buyer making a multi-system purchase, or an individual with one-off requirements, we invite you to take a close-up of the competition and then compare them with Gateway. For quality, service and honest value-for-money Gateway stands up to the test – no matter how close you look. So call us now, it could be the the most valuable free phone call you'll ever make!



# Take A Close-Up Look At Our Prices

## Professional Systems

### P4D-66I

- Intel® 66MHz 486DX2 Processor\*
- 4MB RAM
- 3.5" Diskette Drive
- Quad-Speed CD-ROM
- 540MB 11ms IDE Hard Drive with PCI Enhanced IDE interface
- PCI Integrated Local Bus Graphics with 1MB
- 14" CrystalScan® Colour Monitor
- Mini Desktop Case
- 102-Key Keyboard & MS Mouse
- MS-DOS® 6.22, WFW 3.11
- MS Works for Windows™ 3.0
- MS Money

**£849**

### P4D-66

- Intel 66MHz 486DX2 Processor\*
- 8MB RAM, 128KB Cache
- 3.5" Diskette Drive
- Quad-Speed CD-ROM
- 540MB 11ms IDE Hard Drive with PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- 15" Vivitron® Colour Monitor
- Desktop Case
- 102-Key Keyboard & MS Mouse
- MS-DOS 6.22, WFW 3.11
- MS Office Professional™ 4.3

**£1199**

### P5-60

- Intel 60MHz Pentium® Processor\*
- 8MB RAM, 256KB Cache
- 3.5" Diskette Drive
- Quad-Speed CD-ROM
- 730MB 10ms IDE Hard Drive with PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- 15" Vivitron Colour Monitor
- Desktop Case
- 102-Key Keyboard & MS Mouse
- MS-DOS 6.22, WFW 3.11
- MS Office Professional 4.3

**£1299**

### P5-100

- Intel 100MHz Pentium Processor\*
- 8MB RAM, 256KB Cache
- 3.5" Diskette Drive
- Quad-Speed CD-ROM
- 1GB 10ms IDE Hard Drive with PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 2MB
- 15" Vivitron Colour Monitor
- Desktop Case
- 102-Key Keyboard & MS Mouse
- MS-DOS 6.22, WFW 3.11
- MS Office Professional 4.3

**P5-100 • £1799**

**P5-90 • £1699**

## Multimedia Systems

### P4D-66I FAMILY PC™

- Intel 66MHz 486DX2 Processor\*
- 8MB RAM
- 3.5" Diskette Drive
- Quad-Speed CD-ROM
- 540MB 11ms IDE Hard Drive with PCI Enhanced IDE Interface
- PCI Integrated Local Bus Graphics with 1MB
- 16-Bit Sound Card with Speakers
- 14" CrystalScan Colour Monitor
- Mini Desktop Case
- 102-Key Keyboard & MS Mouse
- MS-DOS 6.22, WFW 3.11
- Family PC Software Bundle
- MS Encarta '95

**£1099**

### P5-75 MULTIMEDIA

- Intel 75MHz Pentium Processor\*
- 8MB EDO RAM
- 3.5" Diskette Drive
- Quad-Speed CD-ROM
- 730MB 10ms IDE Hard Drive with PCI Enhanced IDE Interface
- ATI Mach 64 Graphics, 2MB DRAM
- Ensoniq Wavetable Sound Card with Premium Speakers
- 15" Vivitron Colour Monitor
- Desktop Case
- 102-Key Keyboard & MS Mouse
- MS-DOS 6.22, WFW 3.11
- MS Office Professional 4.3
- MS Encarta '95

**£1499**

### P5-90 PREMIUM

- Intel 90MHz Pentium Processor\*
- 16MB RAM, 256KB Cache
- 3.5" Diskette Drive
- Quad-Speed CD-ROM
- 1GB 10ms IDE Hard Drive with PCI Enhanced IDE Interface
- ATI Mach 64 Graphics, 2MB DRAM
- Ensoniq Wavetable Sound Card with Premium Speakers
- 15" Vivitron Colour Monitor
- Desktop Case
- 102-Key Keyboard & MS Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional 4.3
- MS Encarta '95

**£1999**

### P5-100 EXECUTIVE

- Intel 100MHz Pentium Processor\*
- 16MB RAM, 256KB Cache
- 3.5" Diskette Drive
- Quad-Speed CD-ROM
- 1GB 10ms IDE Hard Drive with PCI Enhanced IDE Interface
- ATI Mach 64 Graphics, 2MB VRAM
- Ensoniq Wavetable Sound Card with Premium Speakers
- 17" Vivitron Colour Monitor
- Tower Case (145 watt)
- 125-Key AnyKey® Keyboard & MS Mouse
- MS-DOS 6.22, WFW 3.11
- MS Office Professional 4.3
- MS Encarta '95

**£2299**

## NEW Top-of-the-Range System

### P5-120 ELITE

- Intel 120MHz Pentium Processor\*
- 16MB EDO RAM
- 256KB Pipelined Burst Mode Cache
- 3.5" Diskette Drive
- Triple Deck Quad-Speed CD-ROM
- 1GB 10ms IDE Hard Drive with PCI Enhanced IDE Interface
- ATI Mach 64 Graphics, 2MB VRAM
- Ensoniq Wavetable Sound Card with Premium Speakers
- 17" Vivitron Colour Monitor
- Tower Case (300 watt)
- 125-Key AnyKey Keyboard & MS Mouse
- MS-DOS 6.22, WFW 3.11
- MS Office Professional 4.3
- MS Encarta '95
- MS Money

**£2599**

## Portables

### LIBERTY™ DX4-100

- 1.9kg (4.2 lbs)
- 25.4 x 20.3 x 4.1cms (10 x 8 x 1.6")
- Intel 100MHz 486DX4 Processor
- 8MB RAM
- Infrared Capability
- 720MB Removable IDE Hard Drive
- 10.4" Dual-Scan STN Colour Display
- NiMH Battery & AC Pack
- Instant On
- 2 PCMCIA Type II Slots
- 78-Key Keyboard & Pointer
- Parallel, Serial, VGA & PS/2 Ports
- MS-DOS 6.22, WFW 3.11
- MS Office Professional 4.3

**£2599**

### LIBERTY DX4-100 GOLD

- 1.9kg (4.2 lbs)
- 25.4 x 20.3 x 4.1cms (10 x 8 x 1.6")
- Intel 100MHz 486DX4 Processor
- 24MB RAM
- Infrared Capability
- 720MB Removable IDE Hard Drive
- 10.4" Dual-Scan STN Colour Display
- 2 NiMH Batteries & AC Pack
- Instant On
- 2 PCMCIA Type II Slots
- PCMCIA 14.4 Fax Modem
- 78-Key Keyboard & Pointer
- Parallel, Serial, VGA & PS/2 Ports
- MS-DOS 6.22, WFW 3.11
- Carrying Case
- MS Office Professional 4.3

**£3199**

At Gateway 2000, if you can't find a system that suits your needs, call us – and we'll be happy to build one for you.

All Gateway 2000 systems come with award-winning service and support including:

- 30-day money-back guarantee
- Three-year limited parts warranty
- One-year warranty with factory service for portables
- One-year on-site service on desktop systems
- Lifetime Freephone technical support
- Extended warranty options available



\*Intel Verified:  
Upgradable



Gateway 2000 Europe • European Headquarters • Clonsaugh Industrial Estate • Dublin 17 • Ireland  
Telephone: 00-353-1-797-2000 • Fax: 00-353-1-848-2022 • FaxBack: 00-353-1-867-0400  
Gateway Bulletin Board: 00-353-1-867-0433 • Hours of Business: 8am-9pm Weekdays, 9am-6pm Saturdays

All prices and configurations are subject to change without notice or obligation. All prices are quoted in Sterling and exclude carriage and VAT.

Printed on Environmentally Friendly Paper



# And Compare The Value

## SOFTWARE

All Gateway 2000 systems are preloaded with Microsoft MS-DOS 6.22 and Windows for Workgroups 3.11. Software comes complete with master diskettes and documentation (either printed or on CD-ROM). Software is tested and optimally configured for your system, eliminating potential installation and set-up errors.

### ■ Microsoft® Works for Windows™

Many of our systems come with Works, the integrated application that combines all the tools you need to run a business: word processor, spreadsheet, database and electronic communications. It's simple to use, yet powerful.

### ■ Microsoft Office Professional™

Some of our systems now include Microsoft Office Professional 4.3 on CD-ROM as standard. This package contains all of Microsoft's most popular applications: Word, Excel, PowerPoint and Access.

### ■ Family PC Software Bundle

Gateway 2000 Family PCs come with Microsoft Works, Money, Golf, Publisher and Musical Instruments. Now you also get Creative Writer, the perfect writing tool for children.

### ■ Kid's Stuff – with Microphone

Six exciting CD titles combining both fun and learning activities. Titles include: The Cat Came Back, Sitting on the Farm, Incredible Machine II, Count Down, Amanda Stories & Word Stuff. **£69**

## PERIPHERALS

### ■ Basic Audio Multimedia Kit

Creative Labs 16-bit Sound Blaster sound card, 2 Altec Lansing ACS5 speakers and CD-ROM. **£169**

### ■ Wavetable Audio Multimedia Kit

Ensoniq Soundscape 16-bit Wavetable sound card (compatible with MT-32, FM mode and General MIDI Sound Blaster, AD Lib, Roland MPU 401), MS Windows Sound System, Altec Lansing ACS31 speakers and CD-ROM. **£269**

If your system includes a CD-ROM drive, you can purchase the Basic Audio Multimedia Kit for **£70** and the Wavetable Audio Multimedia Kit for **£170**

### ■ Quad-Speed CD-ROM/Disk Changer

Internal quad-speed CD-ROM drive with IDE interface and 3 bay CD magazine changer. Average access time 330ms. **£189**

### ■ CH FlightStick

Engineered to look and feel like a real jet joystick. Includes two fire buttons and seven foot cable. Durable and ergonomic. **£29**

### ■ TelePath™ II Fax/Modem

Internal fax/modem, 14,400bps modem, V.32bis, 14,400bps fax capability. Software included. **£145**

### ■ Network Cards

Call for Ethernet or Token Ring adaptors.

### ■ Colorado Memory Systems® TBU

250MB internal automatic tape backup unit which copies up to 9.5MB per minute. Software, tape and cable included. **£95**

### ■ Vivitron™ Monitor Upgrades

If your system comes with a CrystalScan® 14" monitor you can upgrade as follows:

- 15" Vivitron colour monitor for **£80**
- 17" Vivitron colour monitor for **£340**
- 20" Vivitron colour monitor for **£1160**

### ■ Hewlett Packard DeskJet 540

Here's a high-quality business printer which also offers great versatility and value. Prints 600 x 300 dpi black text at up to 3ppm or add a low cost optional Colour Kit and add colour to your documents.

### ■ Hewlett Packard DeskJet 560C

Superb high-resolution black print quality plus ability to add rich colour to documents easily. Prints at 600 x 300dpi, 3ppm black print and about four minutes per page colour.

### ■ Hewlett Packard LaserJet 4L

HP's best value-for-money laser printer, the 4L runs at 300 dpi, 4ppm. With 1MB memory.

*Please call for more information and prices on our range of printers.*

### ■ 2GB SCSI Bundle

Kit includes 2GB SCSI drive and Adaptec AHA-2940 PCI SCSI Controller. **£608**  
To upgrade from 1GB IDE drive **£359**

### ■ SCSI DAT Tape Drive

Colorado Memory Systems drive stores up to 4GB typically on a single cassette tape, at up to 44MB per minute. **£649**

## PORTABLE OPTIONS

- PCMCIA Fax/modem. **£199**
- Memory upgrades.
- Liberty 720MB removable hard drive.
- 3.5" 1.44MB external floppy drive for Liberty.
- Padded, soft-sided case custom designed for the Liberty.
- Additional batteries for portables.

**Call us for pricing today!**

## SOFTWARE

Every Gateway 2000 system comes with excellent after-sales support. Our technical support staff is renowned for being friendly and helpful. When you buy a Gateway 2000 system, you get:

- 30-day money back guarantee
- 3-year limited parts warranty – first year on-site (desktops only)
- Freephone technical support
- On-site service (desktops only)
- Extended warranty options available

If our technical support staff determines that an on-site service call is needed, we will send a technician to most locations in the UK at no charge during the warranty period. We regret that you must pay shipping if you return your system within the 30-day guarantee period. Please call for more information on our guarantee, warranty and on-site service programmes.

### WARRANTY OPTIONS

|                        | 1 Year   | 2 Years | 3 Years |
|------------------------|----------|---------|---------|
| Next Business Day      |          |         |         |
| On-Site Repair Service |          |         |         |
| At GW Discretion       | Free/Std | £75     | £150    |
| Same Day On-Site       |          |         |         |
| Repair Service         | £40      | £105    | £210    |



We also offer convenient payment options including advanced payment and major credit cards. We charge your credit card only when your system is despatched. Net 30-day credit terms are also available to qualified commercial customers.



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The software, peripherals and upgrades listed here are sold only with a purchase of a Gateway 2000 PC.



# LEVEL TECHNOLOGY

**Fault Tolerant Disk Arrays**  
**MICROPOLIS RADION LT**  
& LS capacities up to 250GB

**RADION LT**

Novell Certified  
Mean Time Between Data Loss (MTBDL)  
measured in millions of hours  
Modular Expansion

|       |         |               |       |
|-------|---------|---------------|-------|
| 4.3GB | LT4200  | 2.1GB Modules | £4440 |
| 6.0GB | LS6040  | 3.0GB Modules | £5986 |
| 8.6GB | LT8600  | 4.3GB Modules | £POA  |
| 18GB  | LT18000 | 9.0GB Modules | £POA  |

## EDUCATION & CORPORATE DISCOUNTS

## MONITORS

All monitors are low radiation  
MRP II compliant

| Model           | Size | Resolution  | Price |
|-----------------|------|-------------|-------|
| Hyundai         |      |             |       |
| HL 4850         | 14"  | 1024 x 768  | £169  |
| HL 4860         | 14"  | 1024 x 768  | £189  |
| HL 5864         | 15"  | 1280 x 1024 | £238  |
| HL 7682         | 17"  | 1600 x 1280 | £519  |
| SONY            |      |             |       |
| CDPD 15SF1      | 15"  | 1280 X 1024 | £310  |
| CDPD 17SF1      | 17"  | 1024 X 1024 | £640  |
| GDM17SE1T       | 17"  | 1600 X 1200 | £849  |
| GDM 20SE1VT 20" | 20"  | 1280 X 1024 | £1349 |
| GDM 22SE1T      | 20"  | 1600 X 1200 | £1440 |
| IDEK            |      |             |       |
| MF-5315         | 15"  | 1280 X 768  | £295  |
| MF-8617         | 17"  | 1280 X 1024 | £615  |
| MT-9121         | 21"  | 1600 X 1200 | £1424 |

## GRAPHIC CARDS

| Model          | BUS      | RAM | Resolution  | Refresh | Price |
|----------------|----------|-----|-------------|---------|-------|
| Nitro 64       | ISA      | 1MB | 1280 x 1024 | 75Hz    | £92   |
| Powergraph64   | VESA     | 2MB | 1280 x 1024 | 76Hz    | £117  |
| LightSpeed VL  | VESA     | 2MB | 1280 x 1024 | 90Hz    | £126  |
| Nitro64        | PCI      | 1MB | 1280 x 1024 | 75Hz    | £75   |
| Powergraph64   | PCI      | 2MB | 1280 x 1024 | 76Hz    | £117  |
| Velocity64     | PCI      | 2MB | 1600 x 1200 | 75Hz    | £215  |
| Velocity64     | PCI      | 4MB | 1600 x 1200 | 75Hz    | £320  |
| DIAMOND        |          |     |             |         |       |
| Stealth64 DRAM | VESA/PCI | 2MB | 1280 x 1024 | 120Hz   | £149  |
| Stealth64 VRAM | VESA/PCI | 2MB | 1280 x 1024 | 120Hz   | £259  |

## CONTROLLERS

| Model       | Bus  | Price |
|-------------|------|-------|
| 1515(kit)   | ISA  | £73   |
| 1542+(kit)  | ISA  | £199  |
| 2842VL(kit) | VESA | £190  |
| 2742(kit)   | EISA | £235  |
| 1640(kit)   | MCA  | £210  |
| 2940(kit)   | PCI  | £230  |

| Model      | Bus  | Price |
|------------|------|-------|
| TMC1680SVP | ISA  | £180  |
| TMC3260    | PCI  | £139  |
| TMC7000EX  | EISA | £399  |
| MCS700SVP  | MCA  | £135  |

## MULTIMEDIA UPGRADE KITS

|  |      |
|--|------|
| Family 15: Includes Creative 563 CD Drive, SoundBlaster 16, Headphones, Microphone Microsoft Office  | £429 |
| Family 16: Includes Creative 563 CD Drive, SoundBlaster 16, Speakers, Joystick and 8 Games Titles.   | £249 |
| Family 17: Includes Creative 563 CD Drive, SoundBlaster 16, Choice of Titles   | £210 |
| Family 18: Includes Creative 563 CD Drive, SoundBlaster 16, Speakers, Microphone, Encarta 95, Dangerous Creatures Works V3.0, Golf, Scenes.                            | £249 |
| Family 16+: Includes Creative 563 CD Drive SoundBlaster 16, Encarta 95, Dangerous Creatures, Works V3.0, Money, Golf, Scenes, Adlus Photostyler, Grolier Encyclopedia. | £265 |
| Family 18 SCSI: Includes NEC Triple Speed CD Drive, SoundBlaster 16 SCSI, Choice of Titles   | £410 |
| Family 16 SCSI+: Includes NEC Triple Speed CD Drive, SoundBlaster 16 SCSI, Encarta 95, Dangerous Creatures, Works V3.0, Money, Golf, Scenes.                           | £455 |
| High Quality Speakers  | £20  |

## RE-WRITABLE OPTICAL

| Make    | Model   | Capacity | Price |
|---------|---------|----------|-------|
| Fujitsu | M2512A  | 230MB    | £472  |
| Sony    | SMO-521 | 1.3GB    | £1250 |

## MULTIMEDIA

### SOUND CARDS

|                            |      |  |
|----------------------------|------|--|
| Creative Labs              |      |  |
| SoundBlaster 16 Value Pack | £74  |  |
| SoundBlaster 16 MCD        | £101 |  |
| SoundBlaster 16 SCSI       | £137 |  |
| SoundBlaster AWE 32        | £196 |  |
| Orchid                     |      |  |
| SoundDrive 16EZ            | £72  |  |
| SoundWave 32 Plus          | £165 |  |
| SoundWave 32 SCSI          | £175 |  |
| SoundWave Pro              | £165 |  |
| SoundWave Pro SCSI         | £189 |  |

| Model                      | Internal Drive Only         | Price |
|----------------------------|-----------------------------|-------|
| 562B                       | Internal Drive Only         | £103  |
| 562B                       | Internal Drive with I/F Kit | £115  |
| Sony                       |                             |       |
| CDU55S                     | 2.4 Speed Internal SCSI     | £99   |
| CDU55E                     | Double Speed IDE Drive      | £87   |
| NEC                        |                             |       |
| Internal                   |                             |       |
| Quad X 4Xi                 | Quad Speed, IDE Drive       | £185  |
| External 4Xe               | Quad Speed, SCSI Drive Only | £299  |
| Pioneer                    |                             |       |
| DR106                      | Quad Speed, SCSI Drive Only | CALL  |
| CD ROM SCSI 16 Bit I/F Kit |                             | £299  |
| CD ROM Recorders           |                             |       |
| Yamaha CDR100 Quad Speed   |                             | £2599 |
| Philips CDD522             |                             | £2199 |
| Ricoh RS-9200              |                             | £1599 |

## SCSI

|                        |           |       |
|------------------------|-----------|-------|
| Fujitsu                |           |       |
| 264MB                  | M2681S    | £110  |
| 352MB                  | M2682S    | £120  |
| 532MB                  | M2684S    | £175  |
| 1.0GB                  | M2694S    | £375  |
| Quantum                |           |       |
| Maverick               |           |       |
| 270MB                  | MAV270S   | £127  |
| 540MB                  | MAV540S   | £185  |
| Lightning              |           |       |
| 365MB                  | LGT365S   | £125  |
| 540MB                  | LGT540S   | £165  |
| 730MB                  | LGT730S   | £225  |
| Empire                 |           |       |
| 1.0GB                  | 1080S     | £375  |
| 1.4GB                  | 1440S     | £599  |
| 2.1GB                  | 2160S     | £745  |
| IBM                    |           |       |
| 1.0GB                  | Pegasus   | £370  |
| 1.0GB                  | 45G9504   | £375  |
| 2.0GB                  | 86F0102   | £762  |
| 4.0GB                  | 90F0780   | £1505 |
| Micropolis             |           |       |
| 1.0GB                  | MIC4110   | £375  |
| 2.0GB                  | MIC4221S  | £690  |
| 3.0GB                  | MIC1936S  | £739  |
| 4.0GB                  | MIC3243S  | £1195 |
| 9.0GB                  | MIC1991S  | £2100 |
| AV Drives (Micropolis) |           |       |
| 2.0GB                  | MIC4221AV | £758  |
| 3.0GB                  | MIC1936AV | £810  |
| 4.0GB                  | MIC3243AV | £1299 |
| 9.0GB                  | MIC1991AV | £2190 |

## IDE

|            |           |      |
|------------|-----------|------|
| Samsung    |           |      |
| 280MB      | SHD30280A | £111 |
| Fujitsu    |           |      |
| 264MB      | M2681T    | £110 |
| 352MB      | M2682T    | £115 |
| 528MB      | M2684T    | £160 |
| Quantum    |           |      |
| 170MB      | LPS17080  | £90  |
| 270MB      | MAV270AT  | £110 |
| 365MB      | LGT365AT  | £128 |
| 540MB      | MAV540AT  | £144 |
| 730MB      | LGT730S   | £220 |
| Micropolis |           |      |
| 1.0GB      | MIC2210AT | £305 |

## CABLES & ACCESSORIES

|   |       |
|---|-------|
| Centronic 50 - Centronic 50                 | £15   |
| Centronic 50 - 25 Pin D Type                | £20   |
| Centronic 50 - Micro D 50                   | £40   |
| Ribbon Cables                               |       |
| Single Drive Internal                       | £7.50 |
| Dual Drive Internal                         | £9.50 |
| Triple Drive Internal                       | £15   |
| Terminators                                 |       |
| External Active                             | £36   |
| External Passive                            | £9    |
| Mounting Frames                             |       |
| Standard 3.5" 5.25" Hard drive mounting kit | £10   |

For External Drives +  
£61 (3.5") & £70 (5.25")

## TAPE BACKUP SYSTEMS

| TAPE STREAMERS |          |          |        |         |      |         |
|----------------|----------|----------|--------|---------|------|---------|
| make           | model    | capacity | int    | int kit |      |         |
| Wangtek        | 5150S    | 250MB    | £325   | £415    |      |         |
| Wangtek        | 5525ES   | 525MB    | £395   | £485    |      |         |
| Wangtek        | 51000    | 10GB     | £550   | £640    |      |         |
| DAT            |          |          |        |         |      |         |
| make           | model    | DDS2     | native | comp    | int  | int kit |
| HP             | 35470    | no       | 2.0GB  |         | £620 | £695    |
| HP             | 3548     | no       | 2.0GB  | 4.0GB   | £695 | £820    |
| HP             | C1533    | yes      | 8.0GB  | 16GB    | £875 | £995    |
| Sony           | SDT 5200 | yes      | 4.0GB  |         | £595 | £670    |
| Sony           | SDT 5000 | yes      | 4.0GB  | 16GB    | £640 | £715    |
| Wangdat        | 3100     | no       | 2.0GB  |         | £645 | £735    |
| Wangdat        | 3200     | no       | 2.0GB  | 8GB     | £679 | £769    |

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# COMPAQ

(MONITOR NOT INCLUDED)

|                          |           |          |
|--------------------------|-----------|----------|
| Enh. Prolinea 4/33s, 4Mb | Model 200 | £669.00  |
| Enh. Prolinea 4/50s, 4Mb | Model 200 | £715.00  |
| Enh. Prolinea 4/50, 8Mb  | Model 200 | £879.00  |
| Enh. Prolinea 4/66, 8Mb  | Model 200 | £940.00  |
| Enh. Prolinea 4/100, 8Mb | Model 200 | £1072.00 |

|                       |           |          |
|-----------------------|-----------|----------|
| Deskpro XE 4/33s, 8Mb | Model 170 | £905.00  |
| Deskpro XE 4/50, 8Mb  | Model 170 | £1002.00 |
| Deskpro XE 4/66, 8Mb  | Model 270 | £1081.00 |
| Deskpro XE 5/60, 8Mb  | Model 270 | £1319.00 |

|                       |           |          |
|-----------------------|-----------|----------|
| Deskpro XL 4/66, 8Mb  | Model 270 | £1496.00 |
| Deskpro XL 5/60, 8Mb  | Model 270 | £1761.00 |
| Deskpro XL 5/66, 16Mb | Model 535 | £2428.00 |

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|--------------------|----------------|----------|
| Bravo MS 4/66      | Model 270V 8MB | £943.00  |
| Bravo LC 4/100     | Model 270 8MB  | £1104.00 |
| Bravo MS P/60      | Model 423 8MB  | £1122.00 |
| AST Monitor 4L 14" |                | £225.00  |
| AST Monitor 5L 15" |                | £311.00  |

PLEASE CALL FOR OTHER AST SYSTEMS



## HP (MONITOR NOT INCLUDED)

|                   |               |         |
|-------------------|---------------|---------|
| Vectra VL2 4/50SE | Model 210 4MB | £684.00 |
| Vectra VL2 4/50E  | Model 210 4MB | £709.00 |
| Vectra VL2 4/50E  | Model 340 4MB | £730.00 |
| Vectra VL2 4/66E  | Model 210 4MB | £730.00 |
| Vectra VL2 4/66E  | Model 340 4MB | £770.00 |

PLEASE CALL FOR OTHER HP SYSTEM & PRINTER PRICES



# IBM

(INCLUDES SVGA MONITOR)

|                                   |          |
|-----------------------------------|----------|
| IBM Aptiva 2144-744, 486s/50 M270 | £725.00  |
| IBM Aptiva 2144-858, multimedia   | £1010.00 |
| IBM Aptiva 2144-788, 486/66 M540  | £927.00  |
| IBM Aptiva 2144-856, multimedia   | £1169.00 |
| IBM Aptiva 2144-888, multimedia   | £1128.00 |
| IBM Aptiva 2144-798, P60 540MB    | £1371.00 |

|                        |      |
|------------------------|------|
| IBM PS/2 Server Family | £POA |
| IBM Thinkpad Family    | £POA |

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### ENHANCED PROLINEA, FAMILY

|                                      |         |
|--------------------------------------|---------|
| 141684-001 CAE 3rd party 4Mb memory  | £129.00 |
| 141685-001 CAE 3rd party 8Mb memory  | £259.00 |
| 190747-001 CAE 3rd party 16Mb memory | £485.00 |

### PROLINEA MT FAMILY

|                                      |         |
|--------------------------------------|---------|
| 141684-001 CAE 3rd party 4Mb memory  | £129.00 |
| 141685-001 CAE 3rd party 8Mb memory  | £259.00 |
| 190747-001 CAE 3rd party 16Mb memory | £515.00 |

### DESKPRO XL, FAMILY

|  |         |
|--|---------|
| 118690-001 CAE 3rd party 4Mb memory (2x2)  | £138.00 |
| 148188-001 CAE 3rd party 8Mb memory (2x4)  | £279.00 |
| 148189-001 CAE 3rd party 16Mb memory (2x8) | £540.00 |

### PROSIGNIA FAMILY

|                                      |         |
|--------------------------------------|---------|
| 118690-001 CAE 3rd party 4Mb memory  | £138.00 |
| 128877-001 CAE 3rd party 8Mb memory  | £279.00 |
| 149320-001 CAE 3rd party 16Mb memory | £539.00 |

# COMPAQ MEMORY

NB all 3rd party memory is  
a brand name such as NEC,  
Hitachi or Samsung.



## 01923 210923



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### PROLINEA NET 1 FAMILY

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|-------------------------------------|---------|
| 163679-001 CAE 3rd party 4Mb memory | £129.00 |
| 163680-001 CAE 3rd party 8Mb memory | £259.00 |

### DESKPRO XE FAMILY

|                                     |         |
|-------------------------------------|---------|
| 118690-001 CAE 3rd party 4Mb memory | £138.00 |
| 128877-001 CAE 3rd party 8Mb memory | £289.00 |

### PROSIGNIA VS FAMILY

|                                      |         |
|--------------------------------------|---------|
| 141684-001 CAE 3rd party 4Mb memory  | £123.00 |
| 141685-001 CAE 3rd party 8Mb memory  | £279.00 |
| 190747-001 CAE 3rd party 16Mb memory | £559.00 |

### PROLIANT FAMILY

|                                      |         |
|--------------------------------------|---------|
| 141684-001 CAE 3rd party 4Mb memory  | £138.00 |
| 141685-001 CAE 3rd party 8Mb memory  | £279.00 |
| 190747-001 CAE 3rd party 16Mb memory | £539.00 |



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**WINTYPE 4000 LASER**  
**4 pages per minute print speed**  
**100 page sheet feeder**  
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**Full control from Windows**  
**Printer has no front panel**  
**Fast GDI output from Windows**  
**Emulates Dos, HPIL & Postscript**  
**Produces 600dpi class output**  
**Includes 35 TrueType fonts**  
**Toner and Power save modes**

Tech direct is pleased to offer the printer voted as "Best Value Mono Printer" in the latest Computer Shopper awards. Why share a printer when the Star Wintype 4000 is so readily affordable for every desk? This revolutionary printer is packed with features offering lower operating costs, fast first page print and with a compact footprint that is virtually A4. It's also easy to use. Apart from the on/off button, all printer functions are controlled from the screen in Windows - including a DOS icon to print from DOS applications. Unique Star developments in Microfine Toner and Edge Enhancement Technology give 600dpi quality. The Toner save facility can double the life of the toner cartridge making use of the four print densities available and there is also a Power Save mode.

Introducing the Star LC-90 desktop printer. Once again Star's commitment to design excellence has produced a printer that is easy to install and a treat to use - the automatic sheet feeder takes the hassle out of printing long documents whilst the low noise level keeps the neighbours happy! Low running costs, versatile paper handling, high quality mono printing - no other technology can achieve all this with such a low price. This Star printer offers a performance that cannot be matched for the price whilst still being built to last by the market leader in this field. For added value tech direct is delighted to currently supply this unit with a free push tractor and parallel printer cable (Worth £20 rrp) until April 30th.

**Please see opposite page for prices on other Star printers** Optional serial interface

## LC90 DOT MATRIX

**Low cost 9 pin mono printer**  
**Single sheet & continuous feed**  
**8 resident NLQ fonts inc. italics**  
**Easy to use and install**  
**Low running costs**  
**12 month warranty**  
**192 cps Draft speed**  
**Windows 3.1 driver supplied**  
**50 page auto sheetfeeder**  
**Multi-form compatible**



# Panasonic

The Panasonic range of Ultra Compact printers moves from strength to strength with the launch of the KX-P6100 (pictured right). This is Panasonic's first GDI laser printer. Designed specifically for use under Windows applications this printer utilises the processing power of your PC via its Graphical Device Interface (GDI) to avoid unnecessary translations of commands, reducing document processing time and therefore ensuring a fast throughput time for the first page. As the printer has no internal memory you need never worry about costly upgrades for your printer memory in the future. This printer is also ready for the launch of the new Windows 95 operating system when released. Available now from tech direct this printer represents exceptional value for money.

## KX-P6100 LASER

**Fast 6 pages per minute output**  
**Large 100 sheet input tray**  
**One years on-site maintenance**  
**Full GUI software included**  
**Low running costs**  
**True GDI laser**  
**Resolution enhancement**  
**600 x 300 dots per inch**  
**Compact design**  
**Laser quality at an inkjet price**

**BRAND NEW  
GDI LASER  
LAUNCHED !**



## KX-P4401 LED

**4 pages per minute print speed**  
**100 sheet multi-purpose tray**  
**50 sheet output tray**  
**1 Mb RAM (upgrades to 5Mb)**  
**1 Years on-site maintenance**  
**8 internal scaleable fonts**  
**28 bitmap fonts**  
**Compatible with HP PCL5**  
**Silent in stand-by mode**  
**Power save mode**

Presenting the Panasonic KX-P4401, (pictured left) the ultra compact LED page printer that puts power printing at your side on your desk. Producing crisp, clear laser quality output on plain paper at a rapid 4 pages per minute would normally require a much heavier, bulkier printer; but the compact, upright design and tiny footprint of the KX-P4401 leaves you with both working space and elbow room. With 1MB of RAM, Windows Driver and HP PCL5 compatibility included as standard you can produce sharp text and graphics immediately and easily. Including an energy efficient "sleep mode", your Panasonic printer is completely silent when not printing and is therefore comfortable to live with at home or in the office. With a KX-P4401, your documents will be as distinctive as your printer.

**Please see opposite page for prices on other Panasonic printers**

# tech direct

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### HP INKJET PRINTERS

|                         |       |
|-------------------------|-------|
| HP DESKJET 320          | £163  |
| HP 320 with sheetfeed   | £176  |
| HP DESKJET 320 col. kit | £29   |
| HP DESKJET 320 s/feed   | £49   |
| HP DESKJET 520          | £192  |
| HP DESKJET 540          | £198  |
| HP DESKJET 560C*        | £279  |
| HP DESKJET 660C         | £328  |
| HP DESKJET 850C         | £388  |
| HP DESKJET 1200C        | £625  |
| HP DESKJET 1200C PS     | £989  |
| HP DESKJET 600C         | £824  |
| HP DESKJET 600C PS      | £1228 |



£279

### HP SCANNERS



£669

HP SCANJET IIcx £669  
HP SCANJET IIP £337

### HP CONSUMABLES

|                          |      |
|--------------------------|------|
| <b>HP LASER TONERS</b>   |      |
| HP LASERJET IIP, IIP     | £49  |
| HP LASERJET II, III, IIP | £48  |
| HP LASERJET IISI, 4SI    | £79  |
| HP LASERJET 4L, 4P       | £48  |
| HP LASERJET 4, 4+        | £69  |
| HP LASERJET 4V, 4MV      | £109 |
| <b>INKJET CARTRIDGES</b> |      |
| HP DESKJET 310/20        | £17  |
| HP DESKJET (BLACK)       | £20  |
| HP DESKJET (COLOUR)      | £23  |

### HP LASER PRINTERS

|                     |       |
|---------------------|-------|
| HP LASERJET 4L*     | £348  |
| HP LASERJET 4ML     | £729  |
| HP LASERJET 5P      | £574  |
| HP LASERJET 5MP     | £698  |
| HP LASERJET 4PLUS   | £929  |
| HP LASERJET 4M PLUS | £1249 |
| HP LASERJET 4V      | £1368 |
| HP LASERJET 4MV     | £1975 |
| HP LASERJET 4Si     | £2079 |
| HP LASERJET 4SiMX*  | £2949 |
| HP LASERJET COLOUR  | £4195 |



£929

HP LASERJET 4PLUS £929

### HP FAX MACHINES



£669

HP FAX 950 £669  
HP FAX 900 £519

### HP SUPPORT PACKS

|                     |      |
|---------------------|------|
| HP MONO DESKJETS    | £39  |
| HP COLOUR DESKJETS  | £59  |
| HP DESKJET 1200     | £95  |
| HP LASERJET 4L, 4ML | £95  |
| HP LASERJET 4P, 4MP | £122 |
| HP LASERJET 4PLUS   | £152 |
| HP LASERJET 4V, 4MV | £219 |

### MEMORY

|                   |      |
|-------------------|------|
| 1Mb HP 4L upgrade | £49  |
| 2Mb upgrade       | £99  |
| 4Mb upgrade       | £149 |

### EPSON PRINTERS

#### INKJETS

|             |      |
|-------------|------|
| STYLUS 800+ | £167 |
| STYLUS 1000 | £309 |

#### EPSON STYLUS COLOUR



£321

#### LASERS

|                  |       |
|------------------|-------|
| EPL3000          | £379  |
| EPL5200          | £459  |
| EPL5600          | £589  |
| EPL9000 A3 laser | £Call |

#### DOT MATRIX

|         |      |        |      |
|---------|------|--------|------|
| LX100   | £95  | LX300  | £87  |
| LX1050  | £169 | LQ100  | £96  |
| LQ300   | £141 |        |      |
| LQ150   | £113 | LQ150C | £153 |
| LQ570+  | £184 | LQ870  | £349 |
| LQ1070+ | £269 | LQ1170 | £399 |
| FX870   | £222 | FX1170 | £279 |

### NEC PRINTERS

|                      |      |
|----------------------|------|
| Superscript 610 Plus | £299 |
| Superscript 660      | £419 |
| Superscript 660i     | £567 |
| Superscript Colour   | £667 |

### CANON PRINTERS

#### INKJETS

|                  |       |
|------------------|-------|
| BJ10SX           | £149  |
| BJ10SX SHEETFEED | £42   |
| BJ10SX BATTERY   | £33   |
| BJ200EX          | £209  |
| BJ200            | £182  |
| BJ230            | £248  |
| BJC600 COLOUR    | £342  |
| BJ300            | £336  |
| BJ330            | £402  |
| BJC800 COLOUR    | £1085 |
| BJC820 COLOUR    | £1215 |

#### CANON BJC4000



£264

#### LASERS

|          |       |
|----------|-------|
| LBP-4i   | £409  |
| LBP-4U   | £405  |
| LBP-8 IV | £Call |

### OKI PRINTERS

|             |      |
|-------------|------|
| OKI OL400ex | £345 |
| OKI OL410ex | £465 |

### QMS PRINTERS

Call for excellent prices !!

### STAR PRINTERS

#### STAR WINTYPE 4000



£287

#### DOT MATRIX

|                 |      |
|-----------------|------|
| LC90            | £79  |
| LC100Colour     | £85  |
| LC240           | £89  |
| LC240Colour     | £99  |
| LC24-20MkII     | £115 |
| LC24-300C       | £179 |
| LC15            | £179 |
| LC24-15MkII     | £239 |
| XB24-200 COLOUR | £309 |
| XB24-250 COLOUR | £379 |

### KYOCERA PRINTERS

|                  |       |
|------------------|-------|
| FS-1500          | £1299 |
| FS-1600          | £1249 |
| FS-1600DX duplex | £1870 |
| FS-3500          | £2219 |
| FS-3500DX duplex | £2679 |

### CALCOMP PRINTERS

|          |       |
|----------|-------|
| CCL600S  | £2397 |
| CCL600XF | £Call |

### PANASONIC PRINTERS

#### LASERS

|            |      |
|------------|------|
| KX-P6100   | £269 |
| KX-P4401   | £279 |
| KX-P4430   | £499 |
| KX-P4440   | £698 |
| KX-P5400PS | £469 |

#### PANASONIC KX-P4400



£269

#### DOT MATRIX

|           |      |
|-----------|------|
| KX-P1150  | £88  |
| KX-P2023  | £107 |
| KX-P2124  | £199 |
| KX-P2135C | £125 |
| KX-P3696  | £259 |
| KX-P3626  | £259 |

### BROTHER PRINTERS

|                 |       |
|-----------------|-------|
| HL630           | £326  |
| HL6i (1 Mb Ram) | £425  |
| HL660           | £469  |
| HL6V (1 Mb Ram) | £479  |
| HL-10V          | £795  |
| HL-10H          | £889  |
| HL-10PS         | £1179 |
| HL-1260         | £925  |

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## SCANNERS

### UMAX

If you're thinking about getting a scanner then you need to think about UMAX! UMAX are one of the world's largest manufacturers and as authorised dealers TECH DIRECT can supply a range you wouldn't have thought available at prices you wouldn't have thought possible. So if you want the max, talk to us about UMAX - award winning colour scanners



**T630** - This new three pass colour scanner offers an outstanding specification at an incredible price! 600x300 optical scan resolution for up to 4800 dpi output. Includes Photoshop LE software, SCSI interface, and all cables. Available now at this promotional price **£499**

**T630 PRO** - Includes transparency adaptor and full version of Adobe Photoshop. **£830**

**VISTA S6** - The award winning scanner (PC PRO recommended) with single pass scanning for greater speed. (600x300 optical scan resolution, 4800dpi interpolated). Includes Photoshop LE software. New lower price **£572**

**VISTA S6 PRO** - A complete scanning solution capable of scanning negatives and including transparency adaptor (compare other manufacturers prices) and a full version of Adobe Photoshop (RRP £795) Great value at just **£894**

**VISTA S8** - This new model delivers an optical scan resolution of 800x400 dpi and a maximum resolution of 6400dpi with interpolation. Includes Adobe Photoshop LE software **£705**

**VISTA S8 PRO** - As above with transparency adaptor and full version of Adobe Photoshop. Highly recommended **£1017**

**UC1260** - 1200x600 dpi optical scan resolution with full Adobe Photoshop. (Personal Computer Worlds Editor's choice). This scanner is the professionals choice! **£969**

**UC1260 PRO** - As above with transparency adaptor. A high quality, high speed complete package for just **£1359**

**POWERLOOK PRO** - Designed to replace the traditional drum scanner. Inc full Photoshop and transparency adaptor. Please call for prices on this top of the range pre-press scanner.

**OMNIPAGE DIRECT OCR software- just add £40**

#### EPSON

|                  |       |
|------------------|-------|
| GTX6500 parallel | £435  |
| GTX6500 SCSI     | £495  |
| GTX8000 parallel | £546  |
| GTX8000 SCSI     | £607  |
| GTX9000 SCSI     | £851  |
| GTi6500 SCSI     | £638  |
| GTi8000 SCSI     | £751  |
| GTi9000 SCSI     | £1004 |



All the above bundles include the necessary interface and cables. GTX models include Omnipage Direct, Adobe Photoshop LE and PK Portfolio software. GTi models include full version of Adobe Photoshop software.

**SCANPLUS - COLOUR 6000**

**Desktop sheetfed A4 colour scanning at ONLY - £179**

#### PLUSTEK

This well-priced scanner includes Wordscan & Picture Publisher software, and 16 bit parallel interface card. Features include HP Scanjet IIcx & TWAIN emulation, output resolution of up to 1200dpi, colour (24 bit) 16.8 million colours, grey (8 bit) 256 grey scale levels, and direct scanning with most software.

## PERIPHERALS

### MONITORS

#### PHILIPS

|                      |      |
|----------------------|------|
| 14" 14M MONO VGA     | £89  |
| 14" 14C 800x800 SVGA | £165 |
| 14" 14A 1024x768 NI  | £199 |
| 15" 15B NI STEREO    | £249 |
| 17" 17C 1024x768 NI  | £419 |
| 17" 17A 1280x1024 NI | £649 |

#### BUDGET MONITORS

|                        |      |
|------------------------|------|
| 14" 1024x768 Intlace   | £129 |
| 14" 1024x768LR Intlace | £139 |
| 17" 1280x1024 LR NI    | £445 |

The above monitors include a full 12 month on-site warranty.

#### TAXAN

|                      |       |
|----------------------|-------|
| 14" EV400LR.28dpSVGA | £179  |
| 14" EV410LR.28dp NI  | £195  |
| 14" 788LR.28dp NI    | £215  |
| 17" EV880LR NI       | £519  |
| 17" EV885LR NI       | £619  |
| 17" EV895LR NI       | £839  |
| 20" 1080LR NI        | £899  |
| 21" 2100LR NI        | £1499 |

#### HITACHI

|                         |      |
|-------------------------|------|
| 17" MVX Value (CM1786M) |      |
| 1280x1024 .26dp         | £519 |

#### IDEK/IYAMA

|             |       |
|-------------|-------|
| 15" MF-8115 | £258  |
| 17" MF-8617 | £536  |
| 21" MF-8221 | £1242 |
| 21" MF-8621 | £1639 |
| 21" MT-9121 | £1290 |

### FAX MACHINES

#### PANASONIC

|        |       |
|--------|-------|
| UFV40  | £259  |
| UFV60  | £339  |
| UF321  | £599  |
| UF322E | £649  |
| UF745  | £1045 |
| UF755E | £1389 |

#### SAMSUNG

|        |      |
|--------|------|
| SF40   | £175 |
| SF500  | £189 |
| SF505  | £225 |
| SF800  | £259 |
| SF1505 | £259 |
| SF2800 | £289 |

### US ROBOTICS



|                          |       |
|--------------------------|-------|
| Sportster 28.8 + Fax     | £190  |
| Sportster 14.4 + Fax     | £124  |
| High Speed serial card   | £Call |
| Sportster 14.4 + Fax Int | £125  |
| Courier V34 Turbo Ext    | £259  |
| Courier V34 Turbo Int    | £325  |

## UPGRADEABLE CTX NOTEBOOKS

| CPU     | RAM | SCREEN | HDD | PRICE |
|---------|-----|--------|-----|-------|
| Sx-33   | 4   | dstn   | 260 | £1385 |
| Dx2-50  | 4   | dstn   | 260 | £1489 |
| Dx4-75  | 4   | dstn   | 260 | £1659 |
| Dx4-100 | 4   | dstn   | 260 | £1749 |
| Sx-33   | 4   | tft    | 260 | £2085 |
| Dx2-50  | 4   | tft    | 260 | £2189 |
| Dx4-75  | 4   | tft    | 260 | £2359 |
| Dx4-100 | 4   | tft    | 260 | £2449 |

Upgrade to 340Mb HDD **£50**

Upgrade to 524Mb HDD **£190**

Upgrade to 8Mb Memory **£150**

Docking Station **£385**

Please call for more details and spec sheets on these excellent colour notebooks with three year on-site warranties as standard. Fully upgradeable screens, ram, processors, hard drives etc. Call now for prices.

### CD ROM DRIVES

|                        |            |
|------------------------|------------|
| <b>PANASONIC 562</b>   | <b>£85</b> |
| Interface card for 562 | £8         |

#### NEC

|                           |      |     |      |
|---------------------------|------|-----|------|
| 2Xi                       | £123 | 3Xi | £219 |
| 3XP                       | £248 | 3Xe | £305 |
| 4XP                       | £499 | 4Xi | £260 |
| 4Xe                       | £372 |     |      |
| SCSI I/F (AT 16 BIT)      | £39  |     |      |
| SCSI I/F (MCA)            | £79  |     |      |
| SCSI I/F (Parallel 3X/4X) | £89  |     |      |

### MEDIAVISION KIT

A very competitive multimedia upgrade kit, combining excellent value for money with reliable build quality. Contains:

Sanyo double speed CD-ROM drive  
Pro-Audio 16bit Sound Card  
Smartstart Installation Kit  
Comptons Encyclopedia CD  
Home Survivor CD  
JourneyMan Adventure CD  
Forever Growing Garden CD  
Compuserve CD  
Shielded Stereo Speakers

**PRICE £159**

# LOWEST UK PRICES - CALL NOW!





Redundant is a word that not a lot of us want to hear! However sometimes it means good news not bad.

## Redundant

If the Redundant Array of Inexpensive Disks on your server has a hard drive failure, you can still access all your data, replace the faulty unit and allow your workgroup to carry on working without downing the server.

## Array

The new single channel Accura Modular RAID provides performance, redundancy and fault tolerance with the flexibility to enlarge and upgrade your system as user demands require. Being modular means there are many initial configuration possibilities with an easy future upgrade path.

## Inexpensive

Setting up a spare server in the event of primary failure is also made very quick and easy. With amazingly reasonable pricing who could not specify Adams?

## Disks

The multi channel Accura Integrated RAID offers higher performance through the use of a cached wide SCSI interface (SCSI-III), single or multiple processors completely integrated into a large server case with extensive power handling and expansion capability. Only one choice really.... Adams.



## Accura Modular RAID



### Modular

### features

- Intel® P54C 90/100mhz CPU
- Intel Neptune II 3.3v chipset
- Plug and play compatible with auto configuration (PCI and ISA bus)
- 512k external cache
- 32mb RAM (max 192mb)
- 5 drawer hot swapping RAID box with 5 PSU's
- 2.0gb addressable RAID level 5 array, with 3 x 1gb fast SCSI-II hard drives
- DPT 2124 PCI 32-bit bus mastering RAID controller with 4mb cache memory
- Quad speed, multi session, SCSI CD-ROM drive
- 3.5" 1.44mb floppy drive
- Fast PCI graphics card with 1mb RAM
- 14" Accuscan energy saving, MPR-II monitor, NI, max res 1024 x 768
- 2 serial (16550), 1 parallel port (EPP/ECP)
- 32 bit 100mbps PCI bus mastering ethernet card
- Tower case with 250w PSU
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Operating systems: OS/2 Lan Server, Novell, SCO Unix, Windows NT (not supplied).

## Powered by

### Modular

### Prices

|   |       |
|---|-------|
| Accura Modular RAID with Intel Pentium® 90 CPU as specified in features                 | £5799 |
| Accura Modular RAID with Intel® Pentium 100 CPU as specified in features                | £5899 |
| Accura Modular RAID with Intel® Pentium 90 CPU with 4gb total array, rest as specified  | £6598 |
| Accura Modular RAID with Intel® Pentium 100 CPU with 4gb total array, rest as specified | £6698 |

### Modular

### Options

|  |       |
|--|-------|
| 1gb → 2gb fast SCSI-II HDD (per drive)                       | £399  |
| 1gb → 4gb fast SCSI-II HDD (per drive)                       | £899  |
| Main system memory upgrades per 1mb                          | £31   |
| 5 drive RAID upgrade   | £799  |
| 4gb total capacity, extra 2 x 1gb drives                     |       |
| 5 x 1gb RAID → 5 x 2gb RAID                                  | £2794 |
| 8gb total capacity   |       |
| 5 x 1gb RAID → 5 x 4gb RAID                                  | £4495 |
| 8gb total capacity   |       |
| Motherboard and RAID controller ECC memory upgrade (per 1mb) | £CALL |
| 4-16gb DDS-2 DAT backup (internal)                           | £779  |
| Intel Pro 100, 100/10mbps PCI ethernet                       | £199  |
| Bus mastering 10mbps PCI ethernet                            | £129  |
| Optical drives and jukeboxes                                 | £CALL |
| CD-ROM jukeboxes   | £CALL |

PLEASE CALL FOR MANY MORE OPTIONS

# R. A. I. D.



## Accura Integrated RAID

## Powered by

### Integrated

### Prices

|   |       |
|---|-------|
| Accura Integrated RAID with single Intel Pentium® 90 CPU as specified in features | £6899 |
| Accura Integrated RAID with Intel® Pentium® 100 CPU as specified in features      | £6999 |
| Accura Modular RAID with single Intel® Pentium® 90 CPU with 8gb total array       | £8894 |
| Accura Modular RAID with single Intel® Pentium® 100 CPU with 8gb total array      | £8994 |



### Integrated

### Options

|   |       |
|---|-------|
| 1gb → 2gb fast SCSI-II HDD (per drive)                                  | £399  |
| 1gb → 4gb fast SCSI-II HDD (per drive)                                  | £899  |
| Main system memory upgrades per 1mb                                     | £31   |
| RAID cache upgrades per 1mb   | £36   |
| Intel Pentium® 90 CPU and active h/sink                                 | £469  |
| Intel Pentium® 100 CPU and active h/sink                                | £569  |
| 5 x 1gb RAID → 5 x 2gb RAID   | £1995 |
| 8gb total capacity  |       |
| 5 x 1gb RAID → 5 x 4gb RAID   | £4495 |
| 8gb total capacity  |       |
| Motherboard and RAID controller ECC memory upgrade (per 1mb)            | £CALL |
| Large server case with 2 x 300W hot swappable PSU's (w/g from std case) | £1199 |
| 4 -16gb DDS-2 DAT backup (internal)                                     | £779  |
| DAT DDS-2 autoloaders   | £CALL |
| Intel Pro 100, 100/10mbps PCI ethernet                                  | £199  |
| Bus mastering 10mbps PCI ethernet                                       | £129  |
| Optical drives and jukeboxes  | £CALL |
| CD-ROM jukeboxes  | £CALL |

### Integrated

### features

- Intel® P54C 90/100 CPU 90mhz
- Dual Pentium motherboard with Intel Neptune II 3.3v chipset and PCI and EISA slots.
- Plug and play compatible with auto configuration (PCI and EISA bus)
- 512k external cache
- 32mb RAM (max 512mb)
- 3 channel bus mastering, PCI RAID controller with 4mb cache. Max data transfer as configured 60mb/s
- 4.0gb addressable RAID level 5 array, with 4 x 1gb fast wide SCSI hard drives
- Quad speed multi session SCSI CD-ROM drive
- 3.5" 1.44mb floppy drive
- Fast PCI graphics card with 1mb RAM
- 14" Accuscan energy saving, MPR-II monitor, NI, max res 1024 x 768
- 2 serial (16550), 1 parallel port (EPP/ECP)
- 32 bit 100mbps PCI bus mastering ethernet card
- Server case with 300 W PSU
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Operating systems: OS/2 Lan Server SMP, SCO Unix with SMP extns, Windows NT 3.5 (not supplied).



## Adams

## service

**Warranty:** For your peace of mind Adams offer a 3 year parts and labour warranty on your RAID system. The first year of this warranty is on-site with BS5750 standard eight hour response provided by our partner ICL. All main system components are covered except monitors which are covered by their own manufacturers guarantees. The on-site service can be extended up to 3 years, and in certain areas, a four hour response time can be provided. Please call for specific quotations.

**Ordering:** We are pleased to accept enquiries between 9am and 6pm Monday to Friday. All RAID systems are normally shipped within 2 weeks of order. We accept cheque with order, Visa, Mastercard or American Express. PO's are welcome from FTSE100 listed companies and government departments. Carriage charges at cost, normally around £25 per system. All prices quoted are subject to VAT.



Adams' are the official computer supplier to Williams Renault for 1995

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Advanced Computer Technology

ADAMS TECHNOLOGY LTD, CITY POINT, CHESTER RD, OLD TRAFFORD, MANCHESTER M32 0RW UK. FAX: 0161 877 8864



# Zap!

This month we introduce our new range of servers. They cover all requirements from the small workgroup to large corporate main redundant SFT units, which are designed to carry on running with a variety of faults and breakdowns. Your data has never felt so safe or has had the ability to be accessed so quickly!

**3 year warranty** Our three year parts and labour warranty\* includes the first year's BS5750 approved service on site service with ICL. After this your machine is covered for a further 2 years on a return to base service. If desired this can be upgraded to a full 3 year on site service. We have also further improved technical support (hardware) services and have added a technical information line for more routine enquiries.

**Zap!** Ever feel as though you have been struck by a thunderbolt? You know, one of those days when you have been working long and hard on that project.. ZAP! that dreaded application error has got you! Maybe that could be a thing of the past....

## Accura *Premium*

**Premium 486**



Business lease from £8.49 a week

|                   |                   |
|-------------------|-------------------|
| <b>486DX2-66</b>  | <b>£849 + VAT</b> |
| <b>486DX4-100</b> | <b>£999 + VAT</b> |

- 486DX2-66 or DX4-100 CPU
- 256k external cache
- 4mb RAM (max 128mb)
- 540mb sub 12ms IDE hard drive with built in IDE controller
- 3.5" 1.44mb floppy drive
- Accelerated local bus graphics engine with 1mb RAM (max 2mb)
- 14" Accuscan energy saving, MPR-II monitor, NI, max res 1024 x 768
- 2 serial, 1 parallel port
- Slim desktop case
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Win OS/2 V3.0 preloaded and running
- IBM Works Bonus Pack preloaded and running

**Premium 586**



Business lease from £11.99 a week

|            |                    |             |                    |
|------------|--------------------|-------------|--------------------|
| <b>P60</b> | <b>£1249 + VAT</b> | <b>P75</b>  | <b>£1349 + VAT</b> |
| <b>P90</b> | <b>£1549 + VAT</b> | <b>P100</b> | <b>£1649 + VAT</b> |

- Intel® P5 60mhz CPU or P54C 75/90/100 mhz CPU
- PCI local bus
- 256k external cache
- 8mb RAM (max 128mb)
- 540mb 11ms IDE hard drive with PCI 32-bit IDE controller
- Double speed multi session CD-ROM drive
- 3.5" 1.44mb floppy drive
- Fast PCI graphics card with 2mb RAM
- 15" Accuscan energy saving, MPR-II monitor, NI, max res 1280 x 1024
- 2 serial, 1 parallel port
- Desktop case with 200w PSU
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Win OS/2 V3.0 with Bonus Pack preloaded and running
- Lotus Smart Suite for OS/2 preloaded and running

# Thunderbolt

Adams now ship Win OS/2 Warp V3.0 with all our systems. With a Windows® kernel integrated into it, Win OS/2 will run all your OS/2, Windows® and DOS software in a stable crash free environment, without having to buy any additional operating system. IBM Works Bonus Pack is included with all systems.

**Lotus Smart Suite for OS/2** is bundled with many units in our range. This provides AMI Pro, Lotus 1-2-3, Lotus Freelance Graphics and cc:Mail. A complete suite of applications with many more features than offered by the equivalent Windows versions.

**Premium** Our Premium systems are the quality and value for money compromise that we all want. With Win OS/2 Warp and Lotus Smartsuite they are even better value.

**Professional** The top of the heap Professionals are for those who require the best, period. The very best components making the best systems. For full details and information on the Professional range call sales on 0161 877 8822.

**PS:** Don't forget to add VAT to all prices!

## Accura *Professional*

Powered by

**Professional 486**



Business lease from £12.49 a week

|                   |                    |
|-------------------|--------------------|
| <b>486DX2-66</b>  | <b>£1299 + VAT</b> |
| <b>486DX4-100</b> | <b>£1399 + VAT</b> |

- Intel® 486DX2-66 or 486DX4-100
- Fully EPA energy star compliant
- Micronics X30 chipset
- 256k external cache
- 8mb RAM (max 64mb)
- 540mb sub 12ms IDE with 32 bit local bus mode 3 enhanced IDE controller
- Quad speed multi session CD-ROM drive
- 3.5" 1.44mb floppy drive
- ATI Mach 64, 64-bit graphics engine with 2mb RAM
- 15" Accuscan energy saving, MPR-II monitor, NI, max res 1280 x 1024
- 2 serial (16550), 1 parallel port (EPP/ECP)
- Slim desktop case
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Win OS/2 V3.0 with preloaded and running
- Lotus Smart Suite for OS/2 preloaded and running

**Professional 586**



Business lease from £25.49 a week

|            |                    |             |                    |
|------------|--------------------|-------------|--------------------|
| <b>P60</b> | <b>£2499 + VAT</b> | <b>P75</b>  | <b>£2599 + VAT</b> |
| <b>P90</b> | <b>£2799 + VAT</b> | <b>P100</b> | <b>£2899 + VAT</b> |

- Intel® P54C 90/100mhz or P5 60mhz CPU
- Intel Neptune 3.3v or Saturn II chipset
- Plug and play compatible with auto configuration
- 256k external cache (upgradable to 512k)
- 16mb RAM (max 192mb)
- 1gb sub 10ms IDE hard drive with PCI 32 bit mode 3 enhanced IDE controller
- Quad speed multi session CD-ROM drive
- Soundblaster® AWE32 sound card and pro-dig spkrs
- 3.5" 1.44mb floppy drive
- Diamond Stealth 64 Video PCI graphics card with 2mb VRAM
- 17" Idek MF8617 energy saving, MPR-II monitor, NI, max res 1600 x 1200, max refresh 100hz
- 2 serial (16550), 1 p/port (EPP/ECP)
- Desktop Case with 200w PSU
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Win OS/2 V3.0 with preloaded and running
- Lotus Smart Suite for OS/2 preloaded and running



superb quality and value for money

## Accura options

Premium 586



Work Station

|                        |                         |
|------------------------|-------------------------|
| <b>P60 £1399 + VAT</b> | <b>P75 £1499 + VAT</b>  |
| <b>P90 £1699 + VAT</b> | <b>P100 £1799 + VAT</b> |

- Intel® P5 60mhz or P54C 75/90/100mhz CPU
- PCI local bus with 256k external cache
- 8mb RAM (max 128mb)
- 730mb sub 12ms IDE hard drive with PCI 32-bit mode 3 enhanced IDE controller
- Quad speed, multi session CD-ROM drive
- 3.5" 1.44mb floppy drive
- Diamond Stealth 64 PCI graphics card with 2mb DRAM
- 15" Accuscan energy saving, MPR-II monitor, NI, max res 1280 x 1024
- 2 serial, 1 parallel port
- Desktop case with 200w PSU
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Win OS/2 V3.0 with Bonus Pack preloaded and running
- Lotus Smart Suite for OS/2 preloaded and running

Premium 586



Multi Media

|                        |                         |
|------------------------|-------------------------|
| <b>P60 £2099 + VAT</b> | <b>P75 £2199 + VAT</b>  |
| <b>P90 £2399 + VAT</b> | <b>P100 £2499 + VAT</b> |

- Intel® P5 60mhz or P54C 75/90/100mhz CPU
- PCI local bus with 256k external cache
- 16mb RAM (max 128mb)
- 1gb sub 10ms IDE hard drive with PCI 32-bit IDE controller
- Quad speed, multi session CD-ROM drive
- Soundblaster® Pro 16 and speakers
- 3.5" 1.44mb floppy drive
- Diamond Stealth 64 PCI graphics card with 2mb DRAM
- 17" Accuscan MPR-II monitor, NI, max res 1280 x 1024
- 2 serial, 1 parallel port
- Desktop case with 200W PSU
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Win OS/2 V3.0 with Bonus Pack preloaded and running
- Lotus Smart Suite for OS/2 preloaded and running

Premium

|   |      |
|---|------|
| 540mb IDE → 730mb 10ms IDE HDD                    | £49  |
| 730mb IDE → 1gb 10ms IDE HDD                      | £119 |
| Memory upgrades per 1mb                           | £31  |
| Fast PCI graphics 2mb →                           | £69  |
| Diamond Stealth 64 with 2mb DRAM                  |      |
| Stealth 64 2mb DRAM → Stealth 64                  | £109 |
| Video 2mb VRAM                                    |      |
| VRAM upgrades 2mb → 4mb                           | £185 |
| 14" → 15" Accuscan Monitor                        | £80  |
| 1280 x 1024, MPR-II                               |      |
| 15" → 17" Accuscan Monitor                        | £269 |
| 75hz refresh, MPR-II                              |      |
| Standard CD-ROM → Quad speed multi session CD-ROM | £79  |
| Sound Blaster Pro 16 (includes Speakers)          | £109 |

Professional

|   |      |
|---|------|
| 1gb IDE → 1gb 8.5ms fast SCSI-II including 32 bit DPT 2024 PCI fast SCSI-II controller (cache and RAID u/g) | £299 |
| 1gb fast SCSI-II → 2gb 9ms fast SCSI-II   | £399 |
| DPT CM4000 cache module (0 mb) for DPT 2024   | £369 |
| Memory for CM4000 (per 1mb)   | £36  |
| DPT DM4000 RAID module  | £369 |
| Diamond Stealth 64 Video 2mb VRAM → Matrox Impression 2+, 2mb VRAM  | £39  |
| Matrox Imp+ → Imp+ 220 with 2mb VRAM  | £99  |
| 2mb → 4mb VRAM upgrade  | £185 |
| 17" Idek → 21" Idek MF-9121 Diatron Pro 1600 x 1200, MPR-II   | £899 |

PLEASE CALL FOR MANY MORE OPTIONS

# & Lightning!

the best system no compromises system

Professional



586 Server

|                         |
|-------------------------|
| <b>P90 £2899 + VAT</b>  |
| <b>P100 £2999 + VAT</b> |

- Intel® P54C 90/100mhz CPU
- Intel Neptune II 3.3v chipset
- Plug and play compatible with auto configuration (PCI and ISA bus)
- 512k external cache
- 16mb RAM (max 192mb)
- 2.0gb 9.5ms fast SCSI-II hard drive with DPT PCI 32-bit bus mastering SCSI controller (caching and RAID u/g)
- Quad speed multi session CD-ROM drive
- 3.5" 1.44mb floppy drive
- Fast PCI graphics card with 1mb RAM
- 14" Accuscan energy saving, MPR-II monitor, NI, max res 1024 x 768
- 2 serial (16550), 1 parallel port (EPP/ECP)
- 32 bit PCI bus mastering ethernet card
- Tower case with 250w PSU
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Operating systems: OS/2, Novell, SCO Unix, Windows NT (not supplied).

Professional



586 Dual Server

|                         |
|-------------------------|
| <b>P90 £3499 + VAT</b>  |
| <b>P100 £3699 + VAT</b> |

- Two Intel® P54C 90/100 CPU's 90mhz
- Intel Neptune II 3.3v chipset
- Plug and play compatible with auto configuration (PCI and EISA bus)
- 512k external cache
- 16mb RAM (max 192mb)
- 2.0gb 9.5ms fast SCSI-II hard drive with DPT PCI 32-bit bus mastering SCSI controller (caching and RAID u/g)
- Quad speed multi session IDE CD-ROM drive
- 3.5" 1.44mb floppy drive
- Fast PCI graphics card with 1mb RAM
- 14" Accuscan energy saving, MPR-II monitor, NI, max res 1024 x 768
- 2 serial (16550), 1 parallel port (EPP/ECP)
- 32 bit PCI bus mastering ethernet card
- Server case with 300 W PSU
- Accutouch 102 key UK keyboard
- Microsoft Ergonomic Mouse
- 3 year parts and labour warranty (first year on site)
- Operating systems: OS/2 Lan Server SMP, SCO Unix with SMP extns, Windows NT 3.5 (not supplied).

ordering

Adams Technology sales lines are open from 9am till 6pm from Monday to Friday. Technical sales staff are available to answer questions on any of our products to help you with any differing requirements that you might have. Please add VAT to all prices quoted. We welcome payment by Visa, Mastercard and American Express, or on a cheque with order basis. We charge £20 for carriage on all systems and servers and £12 for portables. A 14 day money back guarantee\* is offered on all purchases.

All sales are subject to Adams Technology Ltd's terms and conditions of sale. These are available on request. Please call for any further information you may require.



Adams' are the official computer supplier to Williams Renault for 1995

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# Adams

Advanced Computer Technology

ADAMS TECHNOLOGY LTD, CITY POINT, CHESTER RD, OLD TRAFFORD, MANCHESTER M32 0RW UK. FAX: 0161 877 8884





# Accura<sup>5000</sup>

## Pentium 90 Notebook

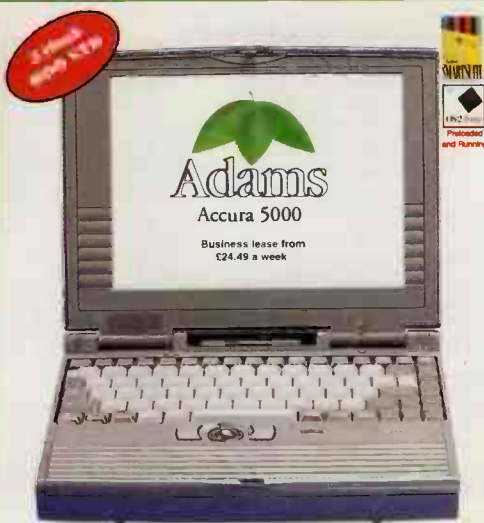
Accura 5000. Fitted with either 75 or 90 mhz Pentium CPU. With a new 10.3" double refresh colour STN or 10.4" TFT active matrix display, 256k level 2 CPU cache, supports the PCI local bus, hard drive interface and graphics controller. 3 PCMCIA slots, 8mb of RAM, full Soundblaster® compatibility combine to make the Accura 5000 one of the highest performing portable computers available today. The Accura 5000 is preloaded with Win OS/2 Warp and IBM Works Bonus Pack, together with and Lotus Smart Suite for OS/2.



### Accura<sup>5000</sup>

#### features

- Intel Pentium P75 or P90 CPU
- 16k level 1 and 256k level 2 cache
- 8mb standard memory upgradeable to 40mb
- PCI local bus controller with 340mb 2.5" fast IDE hard drive upgradeable to 720mb.
- Sound Blaster® 16 bit stereo compatibility with built in speakers and microphone
- 10.3" STN double refresh (Quad Scan) Passive Colour or 10.4" TFT active colour displaying 256 colours
- PCI 32 bit local bus graphics accelerator (C&T 65545) with 1mb RAM giving simultaneous LCD/CRT display and CRT resolutions up to 1024 x 768
- 1.44mb floppy disk drive
- Jade GL829X chipset featuring BIOS controlled power management with suspend, suspend to disk function
- 16mm trackball built in
- 2 PCMCIA type 2 and 1 type 3 slot and/or 1 type 4 slot
- Ni MH battery standard (quickly interchangeable)
- 1 serial port, 1 enhanced parallel port (EPP/EPS), external CRT port, external keyboard/mouse port, d/station port
- Full function 86 key UK keyboard
- Multi voltage 90-265v charger power supply (2.0 hour charge time)
- Dimensions(mm) 279w x 218d x 51.5h Weight 3.09kgs
- Carry slip and utility disk included
- 1 year parts and labour warranty
- 14 day money back guarantee of satisfaction



| Model | Quad Scan Colour | TFT Active Colour |
|-------|------------------|-------------------|
| P75   | £2499            | £3599             |
| P90   | £2649            | £3749             |



### Accura<sup>5000</sup>

#### options

|   |       |
|---|-------|
| Memory upgrade to 16mb                    | £349  |
| Memory upgrade to 24mb                    | £699  |
| Memory upgrade to 32mb                    | £1049 |
| Memory upgrade to 40mb                    | £1399 |
| Upgrade HDD from 340mb - 520mb            | £99   |
| Upgrade HDD from 340mb - 710mb (when avl) | £349  |
| Additional main battery                   | £95   |
| Docking station                           | £CALL |
| Deluxe carry case                         | £39   |
| PCMCIA 9600/2400 modem                    | £149  |
| PCMCIA V32bis fax modem c/w Winfax        | £229  |



### Lotus SMARTSUITE

#### features

- Lotus 1-2-3
- Lotus Freelance Graphics
- Lotus Ami Pro
- Lotus cc:Mail
- Adobe Type Manager included
- Lotus Smart Suite for OS/2 3.0 has more easy to use features than the Windows version
- The same easy to use interface is shared with all Smart Suite applications. Similar menu's, commands and Smart Icons dramatically reduce the learning curve.
- Unique Integration: share all Smart Suite files, create hot live links between applications
- Mail enabled: One click access to cc:Mail from any application
- Drag and drop files into applications to open them
- Drag and drop graphics into frames.
- File names up to 254 characters
- Right mouse button single click access to Workplace Shell
- Crash protection! Crashes don't bring down entire system

# Heavyweight!



# Accura<sup>6000</sup>

## Pentium 100 Superbook

Accura 6000. The ultimate Pentium® notebook. The only 100mhz P5 Notebook in production currently. Probably the most expensive notebook available! This machine brings workstation performance to the portable PC. A complete desktop replacement computer with the CPU running on a 64 bit bus linking the 256k cache and 8mb RAM standard memory, a 32 bit PCI bus controls the 340mb fast SCSI-II hard drive and very fast graphics accelerator. The 10.4" TFT LCD displays 65,536 colours, with simultaneous CRT display and with integrated 16 bit stereo sound provides the ideal presentation machine. There are no problems with cooling as heat is dissipated to the cast magnesium alloy case. The Accura 6000 is loaded with Win OS/2 Warp and IBM Works Bonus Pack, together with and Lotus Smart Suite for OS/2.



### Accura<sup>6000</sup>

#### features

- Intel Pentium 100mhz CPU
- 16k level 1 and 256k level 2 cache
- 8 mb standard memory upgradeable to 128mb (64 bit)
- 32 bit PCI local bus controller with 340mb 2.5" fast SCSI-II hard drive upgradeable to 810mb.
- Sound Blaster® 16 bit stereo compatibility with built in speakers and microphone
- 10.4" TFT active colour displaying 65,536 colours
- PCI 32 bit local bus graphics accelerator (WD90C24A2) with 1mb RAM giving simultaneous LCD/CRT display and CRT resolutions up to 1024 x 768
- External 1.44mb ultra-low profile floppy disk drive
- BIOS controlled power management with sleep, suspend & resume functions
- Trackpoint, pointing device integrated into keyboard
- 2 PCMCIA type 1/2 or 1 type 3 slot
- Ni MH battery standard (quickly interchangeable)
- 1 serial port, 1 enhanced parallel port (EPP/EPS), external CRT port, external keyboard/mouse port, d/station port
- Full function 82 key Lexmark UK keyboard
- Multi voltage 110-240v charger power supply (2.0 hour charge time)
- Dimensions(mm) 300w x 216d x 51h Weight 3.4kgs
- Leather carrying case included
- 1 year parts and labour warranty



Made in England for Adams

### Accura<sup>6000</sup>

#### options

| Accura <sup>6000</sup> | TFT Active Colour |
|------------------------|-------------------|
| P100                   | £5495             |

Please call for details on the full range of Accura 6000 configurations and accessories

Terms and conditions: \*14 day money back guarantee does not apply to special orders. \*3 year warranty subject to warranty terms and conditions. Carriage charges: Notebooks £12 Systems £20. All prices quoted are subject to change without notice, availability and VAT. Payment by cleared funds: VISA or Mastercard P.O.'s welcome from FTSE100 companies, universities, government departments and local authorities. Adams Technology was established in 1989 and is already a corporate, university and MOD supplier. E & O E. \*For the fast heated all machines can be supplied with optional DOS & Windows



## Our pledge

Adams Technology pride ourselves on our products and service. We offer a 14 day money back guarantee\* on all Accura Portables and most systems. A direct technical support line and technical information line are available during business hours. We do our best to ship notebooks within 2-3 days and desktops within 7-10 days. Please don't forget to add VAT to all prices quoted. See previous page for ordering details.

We will keep you up to date with the latest technological advances and where possible offer advantageous upgrades to your Accura Computer

Try something different, try Adams Technology for quality, value for money products and a service second-to-none.



**OFFICIAL SUPPLIER**  
WILLIAMS RENAULT CAR ENGINEERING

Adams' are the official computer supplier to Williams Renault for 1995

## 0161 877 8822

# Adams

### Advanced Computer Technology

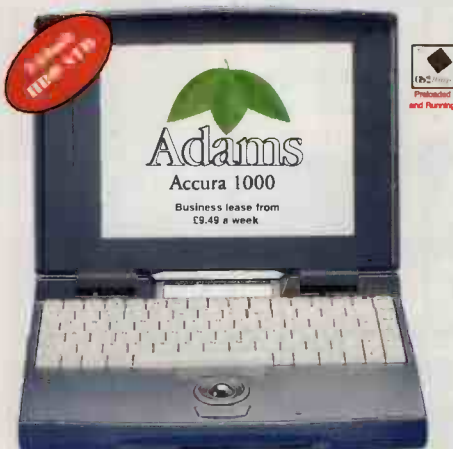
ADAMS TECHNOLOGY LTD. CITY POINT, CHESTER RD. OLD TRAFFORD, MANCHESTER M32 0RW UK. Fax: 0161 877 8694



Our new Accura 1000, represents the *best* in value for money Notebooks. A complete full featured 3.3v CPU based machine with local bus graphics, 2 PCMCIA slots, Ni MH battery and Windows sound system built in. A front mounted trackerball and LCD status display rounds off the feature list on the best value for money portable computer available today. The Accura 1000 comes preloaded with Win OS/2 Warp 3.0 and IBM Works Bonus Pack.

## Accura<sup>1000</sup> features

- 3.3v 486SX-33 SL enhanced CPU upgradeable to 486DX4-100
- 4mb standard memory upgradeable to 32mb
- Quick removable 340mb 2.5" fast IDE hard drive upgradeable to 1gb.
- Sound Blaster® audio compatibility with built in speaker and microphone
- 9.5" Mono LCD with 64 grey levels, Dual Scan Passive Colour or TFT active colour displaying 256 colours, quickly interchangeable
- Local bus graphics accelerator with 1mb RAM giving simultaneous LCD/CRT display and CRT resolutions up to 1024 x 768
- 1.44mb floppy disk drive built in
- BIOS controlled power management with SMM stop clock, suspend to disk function and APM support
- Built in LCD status indicator
- 19mm trackerball built in
- 2 PCMCIA type II and 1 type III slot (type IV slot)
- Ni MH battery standard
- 1 serial port, 1 enhanced parallel port (EPP/EPS), external CRT port, external keyboard port
- Docking Station port
- Full function 84 key UK keyboard
- Multi voltage 90-240v charger power supply (2 hour charge time)
- Weight 2.7kgs with hard drive and battery
- 1 year parts and labour warranty
- 14 day money back guarantee of satisfaction.



## Accura<sup>1000</sup> prices

| Model      | Mono  | Dual Scan Colour | TFT Active Colour |
|------------|-------|------------------|-------------------|
| 486SX-33   | £999  | £1349            | £1899             |
| 486DX2-50  | £1049 | £1399            | £1949             |
| 486DX4-75  | £1149 | £1499            | £2049             |
| 486DX4-100 | £1249 | £1599            | £2149             |

## Accura<sup>1000</sup> options

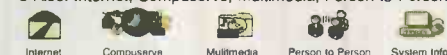
|                                    |      |
|------------------------------------|------|
| Memory upgrade to 8mb              | £169 |
| Memory upgrade to 12mb             | £325 |
| Memory upgrade to 20mb             | £695 |
| Upgrade HDD from 340mb - 520mb     | £99  |
| Upgrade HDD from 340mb - 810mb     | £279 |
| Upgrade HDD from 340mb - 1gb       | £439 |
| Additional main battery            | £89  |
| Car power adaptor                  | £55  |
| Docking station                    | £399 |
| Deluxe carry case                  | £39  |
| PCMCIA 9600/2400 modem             | £149 |
| PCMCIA V32bis fax modem c/w Winfax | £229 |
| 3 year on site warranty            | £150 |

## Win OS/2 3.0 features

- Fast! Full 32 bit operating system
- Windows kernel included, no need to load Windows
- Compatible! Runs all your OS/2, DOS and Windows applications without having to load another operating system!
- Crash proof! If an application fails to respond simply close the Window you are working in and continue working with OS/2
- Full intuitive tutorial that lets you "have a go" with any feature

## Win OS/2 bonus pack features

- IBM works (word processor, spread sheet, database, charting tool and report writer)
- IBM Personal Information Manager (Diary, calendar etc)
- Fax Works (send a fax at the press of a button!)
- Also: Internet, Compuserve, Multimedia, Person to Person



# Lightweight?

## Accura<sup>Portable</sup>

The Accura Portable has proved to be one of the best selling computers we've ever sold, many customers who would only buy big brand names are buying the Accura Portable...why? It truly represents outstanding value for money, with a construction quality better than many of the larger manufacturers, blindingly fast performance with a fully modular design. The Accura Portable is preloaded with Win OS/2 Warp and Bonus Pack.

## Accura<sup>Portable</sup> features

- 486DX2-50 SL'enh CPU upgradeable to 486DX4-100
- 4mb standard memory upgradeable to 20mb
- Quick removable 340mb 2.5" fast IDE hard drive upgradeable to 1gb.
- Yamaha audio chip providing Sound Blaster® compatibility with built in speaker and microphone
- 9.5" Mono LCD with 64 grey levels, Dual Scan Passive Colour or TFT active colour displaying 256 colours, quickly interchangeable
- Local bus graphics accelerator (WD Rocket Chip) with 1mb RAM giving simultaneous LCD/CRT display and CRT resolutions up to 1024 x 768
- Removable 1.44mb floppy disk drive
- "PICO Power" chipset featuring BIOS controlled power management with SMM stop clock and suspend to disk function and built in battery meter
- 19mm Logitech trackerball built in
- 2 PCMCIA type II and/or 1 type III slot
- Ni MH battery standard (quickly interchangeable)
- 1 serial port, 1 enhanced parallel port (EPP/EPS), external CRT port, external keyboard/mouse port, d/station port
- Full function 86 key UK keyboard
- Multi voltage 90-240v charger power supply (1.5 hour charge time)
- Weight 2.4kgs mono, 2.7kgs colour
- Carry slip and utility disk included
- 1 year parts and labour warranty
- 14 day money back guarantee of satisfaction



## Accura<sup>Portable</sup> Prices

| Model      | Mono  | Dual Scan Colour | TFT Active Colour |
|------------|-------|------------------|-------------------|
| 486DX2-50  | £1049 | £1399            | £1999             |
| 486DX2-66  | £1099 | £1449            | £2049             |
| 486DX4-75  | £1149 | £1499            | £2099             |
| 486DX4-100 | £1249 | £1599            | £2199             |

## Our best selling modular notebook

## Accura<sup>Portable</sup> options

|                                    |      |
|------------------------------------|------|
| Memory upgrade to 8mb              | £169 |
| Memory upgrade to 12mb             | £299 |
| Memory upgrade to 20mb             | £699 |
| Upgrade HDD from 340mb - 520mb     | £99  |
| Upgrade HDD from 340mb - 810mb     | £279 |
| Upgrade HDD from 340mb - 1gb       | £439 |
| Additional main battery            | £89  |
| Docking station                    | £375 |
| Deluxe carry case                  | £39  |
| PCMCIA 9600/2400 modem             | £149 |
| PCMCIA V32bis fax modem c/w Winfax | £229 |
| PCMCIA ethernet card               | £189 |

## Adams warranties

**Desktop systems:** For your peace of mind Adams are pleased to announce our new 3 year parts and labour warranty on all desktop systems. The first year of this warranty is on-site with BS5750 standard eight hour response provided by our partner ICL. All main system components are covered except monitors which are covered by their own manufacturers guarantees. This package is one of the best warranties on the market. The on site service can be extended up to 3 years. Please call for specific system quotations.

**Portables:** Your portable system is covered by a 1 year back to base warranty. We have found that in the majority of cases it is quicker and easier to have your notebook returned to our workshop for any service that might be necessary. The exception is the Accura 1000 which has a manufacturers option of a 3 year on site warranty (listed above)

We hope you get many years of satisfaction from your Adams Accura Portable or Desktop System

# AN INCREDIBLE PACKAGE AT AN INCREDIBLE PRICE



## A COMPLETE MULTIMEDIA SYSTEM INCLUDING MICROSOFT OFFICE PROFESSIONAL FOR JUST £1309

A PC that combines the latest in high performance hardware with Microsoft's world beating Office Professional, Sound Blaster Pro 16 and Creative 563 CD Drive.

| Hard Disk | 486 SX2-50 | 486 DX2-66 | Pentium® 75 | Pentium® 90 |
|-----------|------------|------------|-------------|-------------|
| 540Mb     | £1295      | £1355      | £1525       | £1699       |
| 850Mb     | £1360      | £1420      | £1590       | £1764       |
| 1Gb       | £1440      | £1500      | £1670       | £1844       |

Pentium specifications differ slightly from above.

### 486 SYSTEM

*All Machines Include:*

- PCI Motherboard with ZIF Socket for easy upgradeability
- Latest AMI BIOS
- 256K External Cache to speed memory access
- 8Mb Ram (upgradeable to 128Mb)
- Enhanced IDE Hard Drives as standard
- Enhanced PCI IDE Controller to speed disk access
- 1Mb Tseng ET4000/W32 Local Bus Windows Accelerator
- 14" Low Radiation NI Col Monitor (MPRII)
- 2 Fast (16C550) Serial Ports, 1 Bi Directional Port
- 3.5" 1.44Mb Floppy Drive
- Cherry Keyboard
- Choice of Desktop or Mini Tower Case
- MS DOS V6.22 & Windows for Workgroups V3.11 (Full Manuals & Diskettes)

### SOUND BLASTER 16 ASP

- 16 Bit Stereo Sound Card
- 16 Bit & 8 Bit Sampling
- 20 Voice 4 operator FM Music Synthesiser
- Built in Advanced Signal Processor to reduce CPU Workload

### PANASONIC 563

Multi-Session Dual Speed CD Drive MPCII

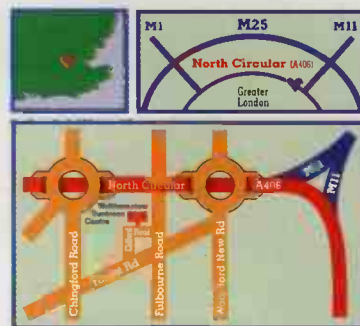
- Double Speed CD Rom Drive
- 300kbs Transfer Rate
- 320ms Data Access
- 64Kb Ram Buffer
- Compatible with Multi Session Photo CD
- CD Rom XA Ready

### MICROSOFT OFFICE PROFESSIONAL ON CD

- MS Word for Windows V6.0
- MS Excel V5.0
- MS Powerpoint for Windows V4.0
- MS Access V2.0
- MS Mail

### ALSO INCLUDED

- MS Office Training CD
- MS Encarta 1994 on CD
- MS Windows Sound System Software
- Stereo Headphones
- Microphone
- Mains Power Speakers
- 5 Year Warranty (1st Year On-Site, remaining 4 years return to base labour only)
- Lifetime Telephone Support



**Showroom Opening Times:**  
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## **Si**MPLY COMPUTERS

FROM THE PEOPLE WHO LOVE PC's  
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Simply Computers Limited,  
28 Walthamstow Business Centre, Clifford  
Road, Walthamstow, London E17 4SX.



# SIMPLY SYSTEMS

## 486 PCI SYSTEMS FROM £895

### All Machines Include:

- PCI Motherboard with ZIF socket for easy upgradeability
- Latest Phoenix BIOS
- 256K External Cache to speed memory access
- 8Mb Ram expandable to 128Mb
- Enhanced IDE Hard Drive as standard
- Enhanced PCI IDE Controller built into Motherboard to speed disk access
- 1Mb Tseng ET4000 W32 PCI Graphics Accelerator
- 14" SVGA Low Radiation N-I Colour Monitor (MPRII)
- 2 Fast (16C550) Serial Ports, 1 Bi Directional Parallel Port
- 3.5" Floppy Drive
- Cherry Keyboard
- Choice of desktop or Mini Tower Case
- MS-DOS V6.22 + Windows for Workgroups 3.11 (Full manuals and diskettes included)
- 5 Year Warranty (1st year on site, remaining 4 years return to base labour only)
- Lifetime Technical Support

| Hard Disk | 486 SX2-50 | 486 DX2-50 | 486 DX2-66 | 486 DX4-75 | 486 DX4-100 |
|-----------|------------|------------|------------|------------|-------------|
| 540Mb     | £895       | £915       | £955       | £979       | £1015       |
| 850Mb     | £960       | £980       | £1020      | £1044      | £1080       |
| 1Gb       | £1040      | £1060      | £1100      | £1124      | £1160       |

## SYSTEM UPGRADES

|  |      |
|--|------|
| 15" SVGA Low Radiation N.I. Monitor..... | £60  |
| 17" SVGA Low Radiation N.I. Monitor..... | £275 |
| Memory per Mb.....                       | £30  |

## PENTIUM® SYSTEMS FROM £1055

### All Machines Include:

- Intel PCI Motherboard with ZIF Socket for easy upgradeability
- Latest Flash BIOS for easy upgradeability
- 256K External Cache to speed memory access
- 8Mb Ram (upgradeable to 128Mb)
- Enhanced IDE Hard Drive as standard
- PCI Local Bus Enhanced IDE Controller to speed disk access
- 1Mb Tseng ET4000 W32 PCI Graphics Accelerator
- 14" SVGA Low Radiation NI Col Monitor (MPRII)
- 2 Serial Ports, 1 Parallel Port
- 3.5" 1.44Mb Floppy Drive
- Size Cherry Keyboard
- Choice of Desktop or Mini Tower Case
- MS DOS V6.22 + Windows for Workgroups V3.11 (Full Manuals & Diskettes)
- 5 Year Warranty (1st Year On-Site, remaining 4 years return to base labour only)
- Lifetime Telephone Support

| Hard Disk | Pentium® 60MHz | Pentium® 66MHz | Pentium® 75MHz | Pentium® 90MHz | Pentium® 100MHz |
|-----------|----------------|----------------|----------------|----------------|-----------------|
| 540Mb     | £1055          | £1069          | £1125          | £1299          | £1395           |
| 850Mb     | £1120          | £1134          | £1190          | £1364          | £1460           |
| 1Gb       | £1200          | £1214          | £1270          | £1444          | £1540           |

## 486 CTX NOTEBOOK FROM £999

### All Machines Include:

- 4Mb Ram Expandable to 32Mb
- Removeable 260Mb IDE Hard Drive
- Internal 1.44Mb Floppy Drive
- 1Mb VESA Local Bus Graphics Card
- 1 Enhanced Parallel Port, 1 Serial Port
- External Monitor Port
- External Keyboard Port
- Integrated 19mm Super Trackball
- 16 bit Sound Blaster Compatible Sound System with built in Speaker and Microphone
- 3 to 6 hour Battery life (NIMH)
- DOS 6.22 and Windows for Workgroups 3.11
- 2 PCMCIA 2 Ports, 1 Type 2, 1 Type 3
- Carry Case
- 12 Months on-site Warranty

|      | SX-33 | DX2-50 | DX4-75 | DX4-100 |
|------|-------|--------|--------|---------|
| Mono | £ 999 | £1135  | £1309  | £1399   |
| DSTN | £1399 | £1535  | £1709  | £1799   |
| TFT  | £2099 | £2235  | £2409  | £2499   |

## NOTEBOOK OPTIONS

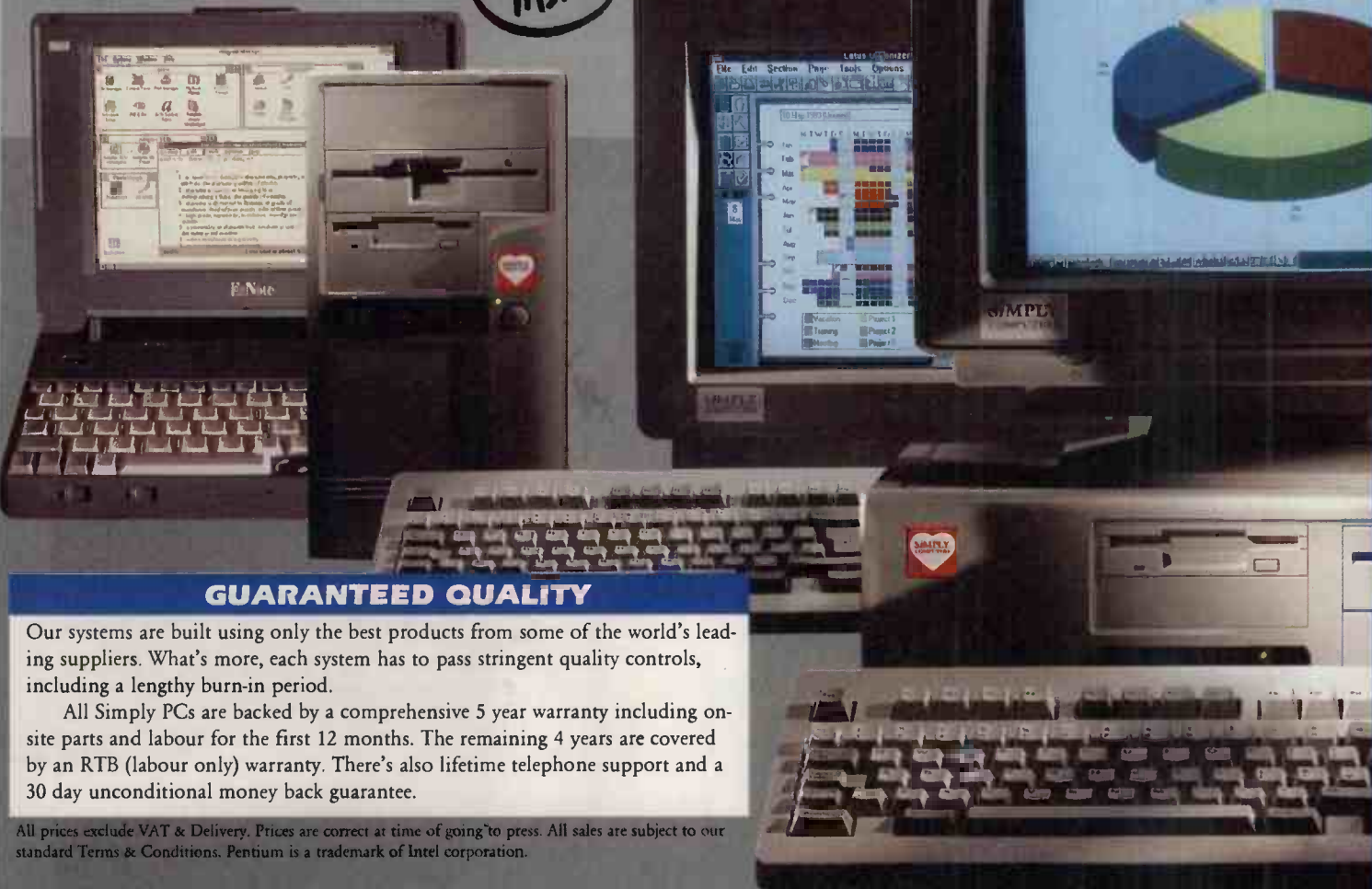
|                                  |      |
|----------------------------------|------|
| Upgrade to 340Mb Hard Drive..... | £60  |
| Upgrade to 540Mb Hard Drive..... | £200 |
| Additional 4Mb Memory.....       | £160 |



January 1995  
Pentium® 60

Editors Choice  
386 SX25 May 92

Best BUY  
386 SX33 May 93



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Our systems are built using only the best products from some of the world's leading suppliers. What's more, each system has to pass stringent quality controls, including a lengthy burn-in period.

All Simply PCs are backed by a comprehensive 5 year warranty including on-site parts and labour for the first 12 months. The remaining 4 years are covered by an RTB (labour only) warranty. There's also lifetime telephone support and a 30 day unconditional money back guarantee.

All prices exclude VAT & Delivery. Prices are correct at time of going to press. All sales are subject to our standard Terms & Conditions. Pentium is a trademark of Intel corporation.

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## CD ROM KITS

### Sound BLASTER MULTIMEDIA OFFICE



**MS Office Professional: MS Word V6, MS Excel V5, MS Powerpoint, MS Access V2, MS Mail Site Licence, MS Encarta 1994, MS Sound System, Creative TextAssist & VoiceAssist.**

**Panasonic 563 CD Drive & Sound Blaster 16 AdSP Card, Microphone, Headphones.**

**ONLY £385**

### Sound BLASTER 16

- 16 BIT STEREO SOUND
- MITSUMI QUAD SPEED IDE
- ENCARTA & PHOTO ACCESS ON CD

**£199**

### Sound BLASTER 16

- 16 BIT STEREO SOUND
- PANASONIC 562 CD DRIVE
- FREE SPEAKERS & PHOTO ACCESS ON CD

**£150**

### Sound BLASTER 16

- 16 BIT STEREO SOUND
- CREATIVE 563 CD DRIVE
- SCREEN BEAT SPEAKERS
- ALDUS PHOTOSTYLER
- GROLIER ENCYCLOPEDIA

**£165**

### Sound BLASTER 16

- 16 BIT STEREO SOUND
- SCSI
- NEC 3XI SCSI TRIPLE SPEED/MULTI SESSION CD DRIVE
- FREE PHOTO ACCESS CD
- SCREEN BEAT SPEAKERS
- MS ENCARTA 1994 (WHILE STOCKS LAST)

**£350**

### Sound BLASTER 16

- 16 BIT STEREO SOUND
- SCSI
- TOSHIBA 3601BA QUAD SPEED/MULTI SESSION CD DRIVE
- FREE PHOTO ACCESS CD
- SCREEN BEAT SPEAKERS

**£355**



## CD DRIVES

|   |     |
|---|-----|
| <b>AT Interface</b>                                     |     |
| Panasonic CR562 Dual Speed AT (inc. Sound & Data Cable) | £80 |
| Creative 563CD with 2 CD's                              | £89 |
| (Contains Aldus Photostyle & Encyclopedia on CD)        |     |
| Panasonic/Sony/Mitsumi Interface Kit                    | £15 |
| Panasonic Interface Kit                                 | £10 |
| <b>IDE Interface</b>                                    |     |
| Wearnes CDD120 Dual Speed IDE                           | £75 |
| Panasonic CR-571B Dual Speed IDE CD                     | £89 |
| Orchid Dual Speed IDE + 2 CD Titles                     | £95 |
| Sony CDDU55E 2.4x EIDE 250ms                            | £89 |

### QUAD SPEED IDE DRIVES

|  |      |
|--|------|
| Mitsumi CRMC-FX400D Quad Speed IDE                         | £125 |
| Mitsumi IDE ATAPI CD Interface Card                        | £13  |
| Toshiba XM5302B Quad Speed ATAPI IDE CD                    | £125 |
| NEC Quad Speed CD IDE (Bare Drive)                         | £139 |
| NEC Quad Speed CD IDE Special Offer                        | £159 |
| (Includes Encarta 95 CD & Photo Access CD, Cable & Screws) |      |
| Teac CDD55E Quad Speed IDE                                 | £185 |

|   |      |
|---|------|
| <b>SCSI Interface</b>                                   |      |
| Sony CDDU55S 2.4x SCSI-2 220ms                          | £125 |
| Toshiba XM-3601B SCSI Quad Speed Bare Internal 4.4x     | £235 |
| Toshiba XM-3601B SCSI Quad Speed Bare Internal kit 4.4x | £335 |
| Toshiba XM-3601B SCSI Quad Speed Bare External kit 4.4x | £435 |
| Toshiba XM5201 SCSI-2 Triple Sp. Bare Internal          | £149 |

### NEC "Take a giant leap into the incredible world of Multispin CD-ROM."

|  |      |
|--|------|
| NEC 3XI Internal Triple Speed SCSI Drive | £215 |
| NEC 3XP+ Triple Speed Portable           | £245 |
| NEC 4XI Internal Quad Speed Drive        | £255 |
| NEC 4X External Quad Speed Drive         | £365 |
| NEC AT SCSI Interface Kit                | £59  |
| NEC AT Parallel/SCSI Interface Kit       | £95  |

|  |        |
|--|--------|
| <b>JukeBox CD Drives</b>                   |        |
| Nakamichi MBR-7 Dual Speed 7 Disk Stacking | £289   |
| Pioneer DRM-602X Dual Speed 6 Disk Jukebox | £385   |
| Pioneer DRM-604X Quad Speed 6 Disk Jukebox | £865   |
| Pioneer 1804X Quad Speed 18 Disk Jukebox   | £1,349 |

|                                 |        |
|---------------------------------|--------|
| <b>Writeable CD ROM Drives</b>  |        |
| Kodak Photo CD Writer 225       | £2,850 |
| Philips CDD522 CD Recorder Ext. | £2,799 |

|   |      |
|---|------|
| <b>Kits</b>   |      |
| Sound Blaster CD16 Discovery Pack (9 CD Titles, 16 Bit Sound, Speakers)   | £195 |
| Sound Blaster GameBlaster CD/10 CD Titles, 16 Bit Sound, Speakers   | £219 |
| Sound Blaster Multimedia Office   | £385 |
| (MS Office Professional, MS Encarta 94, MS Sound System, Creative TextAssist & Voice Assist, Panasonic 563 CD & Sound Blaster 16 AdSP Card, Microphone, Headphones) |      |
| Sound Blaster 16 SCSI & NEC 3XI SCSI  | £350 |
| (Screen Beat Speakers & Photo Access CD)  |      |
| Sound Blaster 16 SCSI & Toshiba 3601B SCSI (Quad Speed)   | £355 |
| (Screen Beat Speakers & Photo Access CD)  |      |
| Orchid SoundWave 32 Multimedia Kit + 2 CD Titles  | £215 |
| (Cinema Folder & Bernuth a Stern Story)   |      |

|                                   |     |
|-----------------------------------|-----|
| <b>CD Storage</b>                 |     |
| 12 Disk Capacity CD Wallets       | £6  |
| 24 Disk Capacity CD Wallets       | £9  |
| 48 Disk Capacity CD Wallets       | £12 |
| 10 Disk Capacity CD Storage Cases | £5  |
| 30 Disk Capacity CD Storage Cases | £10 |



## SOUND CARDS

|   |      |
|---|------|
| <b>SOUND BLASTER</b>  |      |
| Sound Blaster V20 Value (Includes 2 free Games & Free Speakers)             | £25  |
| Sound Blaster Pro Value (Includes 2 free games & Free Speakers)             | £29  |
| Sound Blaster 16 Value (Now available with IDE CD Interface)                | £59  |
| Sound Blaster 16 Pro (Now with IDE & Panasonic CD Interface)                | £89  |
| Sound Blaster 16 SCSI-2   | £114 |
| External SCSI Connector (Converts Internal SCSI connector to External SCSI) | £25  |
| Sound Blaster 16 Pro AdSP   | £110 |
| Sound Blaster 16 ASP SCSI-2   | £134 |
| Sound Blaster AWE 32 Value Edition  | £129 |
| Sound Blaster AWE 32 Full Edition   | £170 |
| 3DO Blaster   | £285 |
| Wave Blaster II   | £95  |
| Midi Blaster  | £105 |

|  |      |
|--|------|
| <b>ORCHID</b>  |      |
| Orchid SoundDrive 16 EZ  | £62  |
| Orchid SoundDrive 16 EZ + SCSI   | £79  |
| Orchid Gamewave 32 Plus  | £99  |
| Orchid Soundwave 32 Pro  | £135 |
| Orchid Soundwave 32 Pro SCSI (Free NASCAR Racing CD while stocks last) | £149 |
| Orchid Wavebooster 2Mb + CueBase Lite                                  | £119 |
| Orchid Wavebooster 4Mb + CueBase Lite                                  | £155 |
| Orchid Wavebooster 4Mb + FX + Midisoft                                 | £179 |

|                            |      |
|----------------------------|------|
| <b>GRAVIS</b>              |      |
| Gravis Ultrasound Card     | £98  |
| Gravis Ultrasound Max Card | £142 |
| Gravis Ultrasound Midi Kit | £29  |

|   |      |
|---|------|
| <b>MICROSOFT</b>                        |      |
| Microsoft Windows Software & Microphone | £39  |
| Microsoft Windows Sound Card            | £105 |

|  |      |
|--|------|
| <b>OTHERS</b>  |      |
| Portable Sound Plus (Sound Blaster compatible connects to Parallel Port) | £129 |
| SPEA   |      |
| Spea Videoseven Media FX   | £125 |

|                                    |     |
|------------------------------------|-----|
| <b>SPEAKERS</b>                    |     |
| Small Speakers                     | £5  |
| Screen Beat 3 Speakers             | £12 |
| Screen Beat 4 Speakers             | £8  |
| Screen Beat 5 Speakers             | £10 |
| Screen Beat Pro 50                 | £29 |
| Soundisk SD-100 Speakers for 5.25" | £15 |
| Small Mains Powered Amp Speakers   | £19 |
| Medium Mains Powered Amp Speakers  | £25 |
| Large Mains Powered Amp Speakers   | £29 |
| Pro Digital Speakers               | £29 |
| Creative 20W Speakers              | £79 |
| Creative 6W Speakers               | £19 |
| Labtec CS-600 Speakers             | £19 |
| Yamaha Multimedia Speakers YST-M   | £39 |
| Yamaha Multimedia Speakers YST-M10 | £55 |
| ZIFI 2 Speakers                    | £25 |
| ZIFI Pro Speakers                  | £45 |

|                    |    |
|--------------------|----|
| <b>ACCESSORIES</b> |    |
| Microphone         | £5 |
| Headphones         | £5 |



## LEISURE

|                                  |     |
|----------------------------------|-----|
| <b>JOYSTICKS</b>                 |     |
| Warrior 5 Joystick               | £49 |
| Warrior 5 Plus Joystick          | £12 |
| Mach 1 Joystick                  | £12 |
| Mach 1 Plus Joystick             | £16 |
| Mach 2 Joystick                  | £21 |
| CH Flightstick                   | £27 |
| CH Flightstick Pro               | £48 |
| CH Virtual Pilot Flight Yoke     | £63 |
| CH Virtual Pilot Pro Flight Yoke | £79 |
| CH Pro Pedal for Flight Sims     | £85 |

|   |     |
|---|-----|
| Gravis Analog                                 | £24 |
| Gravis Professional Analog                    | £32 |
| Gravis Phoenix Flight & Weapon Control System | £95 |
| Gravis Advanced Game Pad                      | £17 |

|                                  |     |
|----------------------------------|-----|
| Logitech Wingman                 | £24 |
| Logitech Wingman Extreme         | £31 |
| Game CARDS                       |     |
| Dual Joystick Splitter Cable     | £9  |
| Gravis Game Card (50Mhz Max)     | £25 |
| CH Gamecard III Auto up to 80Mhz | £28 |
| CH Gamecard III MCA 50Mhz        | £32 |
| IBM Game Card & Joystick 50Mhz   | £19 |



## KEYBOARDS AND RODENTS

|                                   |     |
|-----------------------------------|-----|
| <b>KEYBOARDS</b>                  |     |
| 102 Key UK Keyboard               | £12 |
| Cherry G83-6000 Keyboard          | £18 |
| Cherry G83-3000 Keyboard Membrane | £23 |

### MOUSE & KEYBOARD OFFER SAVE £20

Cherry G83-3000 Keyboard & MS Mouse V2 **ONLY £48**

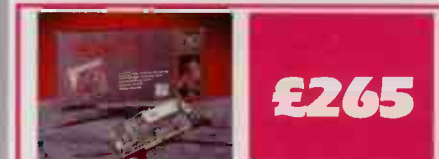
|   |      |
|---|------|
| Cherry G80-3000 Keyboard Click              | £33  |
| Cherry G81-3000 Keyboard Soft               | £31  |
| Microsoft Natural Keyboard                  | £64  |
| PS/2 Keyboard Adapter (AT to PS/2)          | £5   |
| PS/2 Keyboard Adapter (PS/2 to AT)          | £5   |
| Keyboard Extension Cable                    | £8   |
| Cherry G84-4100 Notebook Keyboard           | £65  |
| Cherry G84-4400 Trackball Notebook Keyboard | £199 |
| AKO Keyboard                                | £65  |

|  |     |
|--|-----|
| <b>RODENTS</b>   |     |
| 3 Button Mouse MS Compatible                             | £10 |
| Logitech Pilot Mouse                                     | £17 |
| Logitech Pilot Mouse PS/2                                | £18 |
| Logitech Trackman Pilot                                  | £27 |
| Logitech Mouseman Serial                                 | £29 |
| Logitech Mouseman Sensa Mouse available in four flavours | £39 |
| Logitech Mouseman Bus                                    | £39 |
| Logitech Cyberman 3D Mouse                               | £59 |
| Logitech Trackman Stationary                             | £43 |
| Logitech Trackman Portable                               | £35 |
| Logitech Trackman Voyager                                | £55 |
| Logitech Mouseman Orbitless                              | £49 |
| Microsoft Home Mouse (now bundled with 18 games)         | £27 |
| Microsoft Bus Mouse                                      | £49 |
| Microsoft Mouse V2.0 Combo with "Intellipoint"           | £38 |



## MULTI-MEDIA CARDS

|   |      |
|---|------|
| Video Blaster RT300                           | £279 |
| Video Blaster "FS200"                         | £239 |
| Video Spigot                                  | £89  |
| Creative MF400 (MPEG Player)                  | £199 |
| TV-Coder Internal                             | £103 |
| TV-Coder External                             | £129 |
| Orchid Viola                                  | £249 |
| Orchid Viola Pro                              | £439 |
| Orchid Viola Premium                          | £569 |
| 1Mb Orchid Kelvin MPEG                        | £249 |
| 2Mb Orchid Kelvin MPEG                        | £295 |
| Video Logic Captivator                        | £165 |
| Video Logic Captivator Pro                    | £189 |
| Captivator Pro TV                             | £239 |
| Videologic 1Mb 928 Movie ISA                  | £189 |
| Videologic 1Mb 928 Movie VLB                  | £189 |
| Videologic 1Mb 928 Movie ISA Sound            | £259 |
| Videologic 1Mb 928 Movie VLB Sound            | £259 |
| Videologic 2Mb PCI Movie                      | £329 |
| 1Mb Upgrade Kit for 928 VRAM                  | £85  |
| Videologic 1Mb 928 Movie with MPEG Player ISA | £425 |
| Videologic 1Mb 928 Movie with MPEG Player VLB | £425 |
| Videologic MPEG Player for VMC                | £239 |
| Reelimage Lite                                | £199 |
| Reelimage Full Version                        | £325 |
| Diamond Videostar                             | £279 |
| Rombo Media Pro HI-RES                        | £209 |
| Rombo Media Pro Plus                          | £189 |
| Rombo TV Buster Internal                      | £45  |
| Rombo TV Buster External                      | £45  |
| Rombo PC Tuner                                | £65  |
| Intel Smart Recorder Pro                      | £295 |
| Flexcam Desktop TV Camera                     | £189 |
| Hauppauge WinTV Prima                         | £159 |
| Hauppauge WinTV Cinema                        | £199 |



**£265**

### HAUPPAUGE WIN/TV CELEBRITY

- Frame Grabbing on the fly
- Teletext
- NTSC/PAL Compatible
- Scaleable viewing window from icon to full screen
- FREE OS/2 Warp & Internet Software

|                                     |        |
|-------------------------------------|--------|
| Screen Machine II                   | £659   |
| Screen Machine Lite                 | £641   |
| Logitech Photonan Plus              | £382   |
| Canon Ion PC Camera                 | £395   |
| Fast Aviator MN502010               | £185   |
| Fast Movie Machine                  | £238   |
| Fast Movie Machine Pro              | £465   |
| Video Machine Lite                  | £189   |
| Spea Showtime (MPEG Player)         | £299   |
| <b>VIDEO CONFERENCING</b>           |        |
| Creative Labs ShareVision PC 3000   | £999   |
| Intel ProShare Video System 200     | £1,849 |
| Intel ProShare Premiere Edition SPW | £199   |



**HARD DRIVES**

3.5" IDE

**CONNER HARD DRIVES**

|                                     |      |
|-------------------------------------|------|
| Conner CFS540A 540Mb 12ms EIDE..... | £135 |
| Conner CFS850A 850Mb 12ms EIDE..... | £259 |
| Conner CFS1080A 1Gb 10ms EIDE.....  | £279 |

|  |        |
|--|--------|
| <b>Fujitsu</b>                         |        |
| Fujitsu M2682T 355Mb IDE 14ms.....     | £129   |
| Fujitsu M2684T 528Mb IDE 14ms.....     | £145   |
| <b>Maxtor</b>                          |        |
| Maxtor 420Mb 7420A 12ms.....           | £129   |
| Maxtor 540Mb 7546A 12ms.....           | £139   |
| <b>Microplus</b>                       |        |
| Microplus 205GB 8.5ms 4221AT.....      | P.O.A. |
| <b>Quantum</b>                         |        |
| Quantum Maverick 540Mb 14ms EIDE.....  | £139   |
| Quantum Lightning 540Mb 11ms EIDE..... | £159   |
| Quantum Lightning 730Mb 11ms EIDE..... | £169   |
| <b>Seagate</b>                         |        |
| Seagate ST3491A 428Mb 14ms EIDE.....   | £115   |
| Seagate ST3660A 545Mb 14ms EIDE.....   | £139   |
| Seagate ST3780A 720Mb 12ms EIDE.....   | £199   |
| Seagate ST31220A 1Gb 12ms EIDE.....    | £295   |

**WESTERN DIGITAL**

|   |      |
|---|------|
| Western Digital AC2420 430Mb 13ms EIDE.....     | £125 |
| Western Digital AC2540 540Mb 11ms EIDE.....     | £135 |
| Western Digital AC2700 730Mb IDE 12ms EIDE..... | £179 |
| Western Digital AC2850 850Mb 10ms EIDE.....     | £199 |
| Western Digital AC3110 1.1GB 12ms EIDE.....     | £289 |
| Western Digital AC31200 1.28GB 10ms EIDE.....   | £315 |

2.5" IDE

|   |        |
|---|--------|
| <b>Quantum</b>  |        |
| Quantum Daytona 256Mb 2.5".....   | £199   |
| <b>Seagate</b>  |        |
| Seagate ST9150AG 131Mb 16ms.....  | £155   |
| Seagate ST9190AG 172Mb 16ms.....  | £179   |
| Seagate ST9385AG 341Mb 16ms.....  | £249   |
| Seagate ST9550AG 455Mb 16ms.....  | £415   |
| <b>Toshiba</b>  |        |
| Toshiba MK1724FC 260Mb 13ms.....  | £210   |
| Toshiba MK1824FCV 340Mb 12ms.....   | £249   |
| Toshiba MK2526FC 520Mb 12ms.....  | £369   |
| Toshiba MK2628FC 810Mb 12ms.....  | £485   |
| <b>IBM</b>  |        |
| IBM Pegasus 1Gb EIDE 10ms.....  | £249   |
| <b>INTERFACE KITS</b>   |        |
| ISA Interface Kits.....   | £24    |
| VL Bus Interface Kits.....  | £38    |
| <i>(Kit Contains Interface Card, Cables, Screws, Mounting Brackets, Comprehensive Instructions)</i> |        |
| <b>ACCESSORIES</b>  |        |
| Hard Drive Brackets.....  | £5     |
| Removable IDE Hard Drive Rack.....  | £25    |
| IDE Hard Drive Cable.....   | £5     |
| <b>SCSI</b>   |        |
| <b>Conner</b>   |        |
| Conner CFA540S 540Mb SCSI 9ms.....  | £219   |
| Conner CFP1060 1GB SCSI 9ms.....  | £395   |
| Conner CFP2105S 2GB SCSI 9ms.....   | £725   |
| Conner CFP4207S 4GB SCSI 9ms.....   | £1,395 |
| <b>DEC (Quantum)</b>  |        |
| DEC DSP3107L 1GB SCSI 11ms.....   | £425   |
| DEC DSP3210 2.1GB SCSI 8ms.....   | £845   |
| DEC DSP5400 4Gb SCSI 12ms.....  | £1,425 |
| <b>Fujitsu</b>  |        |
| Fujitsu M2682S 355Mb SCSI 12ms.....   | £125   |
| Fujitsu M2684S 532Mb SCSI 12ms.....   | £159   |
| Fujitsu M1606S 1GB SCSI 9ms.....  | £375   |
| Fujitsu M2903S 2GB SCSI 12ms.....   | £795   |
| Fujitsu M2909S 3GB SCSI 12ms.....   | £1,079 |
| <b>IBM</b>  |        |

**IBM Pegasus 3.5" 1GB 11ms £369**

|   |        |
|---|--------|
| IBM 2GB Starfire 3.5" 9.5ms.....                      | £769   |
| IBM 4GB Starfire 3.5" 9ms.....                        | £1,345 |
| <b>Microplus</b>                                      |        |
| Microplus 2GB 8.5ms Fast SCSI-2 4221.....             | £743   |
| Microplus 4.2GB 8.5ms Fast SCSI-2 3243.....           | £1,098 |
| Microplus 9.1GB 12ms Fast SCSI-2 1991.....            | £1,120 |
| Microplus 2GB 8.5ms Audio Visual 4221AV.....          | £791   |
| Microplus 4.2GB 8.5ms Audio Visual 3243AV.....        | £1,162 |
| Microplus 9.1GB 12ms Audio Visual 1991AV.....         | £1,955 |
| <b>Quantum</b>  |        |
| Quantum Maverick 540Mb 14ms.....                      | £145   |
| Quantum Lightning 540Mb 11ms.....                     | £175   |
| Quantum Lightning 730Mb 11ms.....                     | £215   |
| Quantum Empire 1080 1GB 9ms.....                      | £405   |
| Quantum Empire 1400 1.4Gb 9ms.....                    | £645   |
| Quantum Empire 2100 2.0Gb 9ms.....                    | £849   |
| Quantum Atlas XP32150 2.1Gb 8ms.....                  | P.O.A. |
| <b>Seagate</b>  |        |
| Seagate ST31230N Hawk Fast SCSI-2 1GB 9ms.....        | £739   |
| Seagate ST32430N Hawk Fast SCSI-2 2.1GB 9ms.....      | £769   |
| Seagate ST31250N Barracuda Fast SCSI-2 1GB 8ms.....   | £745   |
| Seagate ST31950N Barracuda Fast SCSI-2 1.7GB 8ms..... | £745   |
| Seagate ST31510N Barracuda Fast SCSI-2 2.1GB 8ms..... | £835   |
| Seagate ST31510N Barracuda Fast SCSI-2 4GB 8ms.....   | £1,579 |
| Seagate Elite Fast SCSI-2 9Gb 10ms.....               | £2,695 |

**REMOVABLE DRIVES**

|                                      |      |
|--------------------------------------|------|
| Squest INT 5.25" 88Mb SCSI Kit.....  | £299 |
| Squest INT 5.25" 200Mb SCSI Kit..... | £425 |
| 44Mb Disk.....                       | £49  |
| 88Mb Disk.....                       | £69  |
| 200Mb Disk.....                      | £99  |
| Squest SQ3270S SCSI 270Mb.....       | £425 |
| Squest SQ310 105Mb Disk.....         | £47  |
| Squest SQ327 270Mb Disk.....         | £55  |

All the IDE Kits contain Cable, SWF, &amp; Appropriate Media. All the SCSI Kits contain Cable, Interface Card, SWF, &amp; Appropriate Media.

**ACCESSORIES****EXTERNAL SCSI CASES**

|                                      |     |
|--------------------------------------|-----|
| Single 5.25" Drive Case 40W PSU..... | £60 |
| Dual 5.25" Drive Case 60W PSU.....   | £75 |
| Quad 5.25" Drive Case 150W PSU.....  | £99 |
| Removable SCSI Hard Drive Rack.....  | £29 |
| SCSI Interface Kit.....              | £69 |

|                                   |     |
|-----------------------------------|-----|
| <b>SCSI Cables</b>                |     |
| Single Drive Internal.....        | £8  |
| Triple Drive Internal.....        | £9  |
| Centronic 50 to Centronic 50..... | £16 |
| Centronic 50 to 25 Pin M.....     | £18 |
| Centronic 50 to Micro D.....      | £29 |
| Micro D to Micro D.....           | £29 |

**FLOPPY DRIVES**

|  |     |
|--|-----|
| 3.5" 1.44Mb Drive.....                   | £22 |
| 5.25" 1.2Mb/360K Drive.....              | £35 |
| Teac 3.5" 1.44Mb Floppy Drive.....       | £28 |
| Teac 5.25" 1.2Mb Floppy Drive.....       | £38 |
| Teac 3.5" & 5.25" Dual Floppy Drive..... | £86 |
| <b>CABLES AND ACCESSORIES</b>            |     |
| 5.25" Floppy Drive Brackets.....         | £5  |
| Standard 5 Head Floppy Cable.....        | £18 |
| Extra Long 5 Head Floppy Cable.....      | £7  |

**FLOPTICAL & OPTICAL DRIVES**

|  |      |
|--|------|
| Fujitsu 230Mb Optical Drive 3.5 Internal Bare..... | £429 |
| Fujitsu 230Mb Optical Drive 3.5 Internal Kit.....  | £629 |
| Fujitsu 230Mb Optical Drive 3.5 Parallel Kit.....  | £729 |

**TAPE STREAMERS**

|                                     |      |
|-------------------------------------|------|
| Jumbo DJ20 250Mb Tape Streamer..... | £95  |
| Jumbo DJ35 350Mb Tape Streamer..... | £139 |
| Jumbo DJ25 680Mb Tape Streamer..... | £189 |
| Jumbo DJ50 1.3Gb Tape Streamer..... | £235 |

**IOMEGA 250Mb TAPE STREAMER**  
**£95**

|  |        |
|--|--------|
| Iomega TAPE 700 Internal Tape Streamer (680Mb with compression)..... | £265   |
| Iomega TAPE 700 External Tape Streamer (680Mb with compression)..... | £339   |
| MC3000XL Tapes for Iomega 700.....                                   | £15    |
| Backup 1080 250Mb Parallel T/S.....                                  | £295   |
| Backup 900 680Mb Parallel T/S.....                                   | P.O.A. |
| Trakker 350Mb Tape Streamer.....                                     | £265   |
| Trakker JT 700Mb Tape Streamer.....                                  | £359   |
| Iomega 250Mb Parallel Tape Streamer.....                             | £225   |
| DC2120 Tape Streamer Tape.....                                       | £12    |
| Conner Tape Store 420.....   | £139   |
| Conner Tape Store 850.....   | £229   |
| Conner 2GB DAT Internal Drive.....                                   | £655   |
| Conner 8GB DAT Internal Drive.....                                   | £695   |
| Wangtek 250Mb Internal SCSI Tape Streamer.....                       | £299   |
| Wangtek 250Mb External SCSI Tape Streamer.....                       | £439   |
| Wangtek 500Mb Internal SCSI Tape Streamer.....                       | £399   |
| Wangtek 500Mb External SCSI Tape Streamer.....                       | £539   |
| Wangtek 1Gb Internal SCSI Tape Streamer.....                         | £499   |
| Wangtek 1Gb External SCSI Tape Streamer.....                         | £639   |
| WangDat 3100 Internal 2Gb SCSI DAT.....                              | £685   |
| WangDat 3100 External 2Gb SCSI DAT.....                              | £795   |
| WangDat 3200 Internal 4.8Gb SCSI DAT.....                            | £840   |
| WangDat 3200 External 4.8Gb SCSI DAT.....                            | £940   |
| WangDat 3400DX Internal 8.16Gb SCSI2 DAT.....                        | £925   |
| WangDat 3400DX External 8.16Gb SCSI2 DAT.....                        | £1,025 |
| 2GB DAT Tapes.....   | £12    |
| HP DAT 2GB 3.5 Internal.....   | £579   |
| HP DAT 4GB 3.5 Internal.....   | £669   |
| HP DAT 8.16Gb 3.5 Internal.....                                      | £799   |

**CONTROLLERS**

|  |     |
|--|-----|
| Amidisk IDE Extension Adapter.....   | £49 |
| <i>(Removes large drive configuration problems and allows use of up to 4 drives)</i> |     |
| <b>IDE ISA</b>   |     |
| IDE 2FDD/2HDD.....   | £9  |
| IDE 2FDD/2HDD 2S,1P,1G.....  | £12 |
| IDE 4FDD/2HDD 2S,1P.....   | £29 |
| IDE 2FDD(2.88Mb)/2HDD 2S,1P,1G.....  | £34 |
| 4FDD 2.88Mb Floppy Controller.....   | £23 |
| <b>IDE ISA Cache</b>   |     |
| Promise DC200 4HDD/2FDD (2.88) 0K.....   | £75 |
| DC-600 IDE Cache 4HDD/2FDD 0K.....   | £89 |

**VESA Local Bus Controllers**

|  |     |
|--|-----|
| VESA Local BUS IDE 2HDD/2FDD 2S,1P,1G.....                           | £16 |
| VESA Local BUS Enhanced IDE 2HDD/2FDD 2S,1P,1G (mode 3 only).....    | £25 |
| VESA Local Bus Enhanced IDE 4HDD/2FDD, 2S, 1P.....                   | £29 |
| <i>(mode 3, 4 &amp; 5 up to 10Mb per Sec, CMD Chipset)</i>           |     |
| VESA Local Enhanced BUS IDE 4HDD/2FDD, 2S, 1P, 1G.....               | £39 |
| <i>(mode 3, 4 &amp; 5 up to 10Mb per Sec, CMD Chipset)</i>           |     |
| VESA Local Bus Enhanced IDE - 4HDD/2FDD, 2S(6550), 1P(FAST), 1G..... | £49 |
| VL395 SCSI/IDE 2S, 1P, 1G 64K Cache.....                             | £99 |
| <i>(mode 3 &amp; 4 up to 10Mb per Sec, Promise Chipset)</i>          |     |
| VL220 Mode 3 IDE Cache 2HDD/2FDD 2S(6550), 1P, 1G 0K.....            | £79 |

|   |      |
|---|------|
| VL355 SCSI/IDE-3 Cache SCSI2HDD,2FDD 2S(6550),1P,1G 0K..... | £89  |
| Promise DC4030VL 4HDD/2FDD.....                             | £89  |
| DC-680VL 4HDD/2FDD 0K.....                                  | £99  |
| Promise DC-420VL 512K 2S, 1P 512K Maximum 1Mb.....          | £89  |
| Promise DC440VL SCSI/IDE 2S, 1P, 1G (Core SPW).....         | £159 |

**PCI Controllers**

|  |      |
|--|------|
| PCI IDE Controller (mode 3, 4).....      | £35  |
| Future Domain SCSI PCI Controller.....   | £125 |
| DC-5030 IDE Cache Controller(0K)PCI..... | £119 |

**SCSI Controllers**

|  |      |
|--|------|
| <b>Adaptec</b>   |      |
| Adaptec Ultra Total CD Kit.....                            | £49  |
| Adaptec Ultra Total Connect Kit.....                       | £69  |
| Adaptec 1542 SCSI Controller Bare.....                     | £130 |
| Adaptec 1542 SCSI Complete Kit.....                        | £170 |
| Adaptec 2742 EISA SCSI Complete Kit.....                   | £259 |
| Adaptec 2740/2 Dual Channel EISA SCSI Complete Kit.....    | £269 |
| Adaptec 2842 VL Local Bus SCSI.....                        | £189 |
| Adaptec IDE/SCSI 2825 Total Advantage VL Bus.....          | £125 |
| Adaptec 2940 PCI SCSI Kit.....                             | £225 |
| Adaptec 2940 PCI SCSI Wide Kit.....                        | £269 |
| Adaptec 460 SCSI PCMCIA.....                               | £225 |
| Adaptec 348 MINISCPI Plus (Parallel SCSI Adapter).....     | £99  |
| Adaptec 358 MINISCPI Plus (Enh Parallel SCSI Adapter)..... | £125 |
| VL Local BUS SCSI Adapter.....                             | £95  |

**I/O Controllers**

|                                       |     |
|---------------------------------------|-----|
| Multi I/O Controller 2S, 1P, 1G.....  | £10 |
| Parallel Port Card.....               | £9  |
| Serial Card.....                      | £9  |
| Serial Card with Fast UART 16550..... | £29 |
| 4 Port RS232 Adapter.....             | £89 |

**MOTHERBOARDS**

|  |      |
|--|------|
| <b>ISA</b>                                   |      |
| 80386SX-40Mhz.....                           | £37  |
| 80386DX-40Mhz 128K Cache.....                | £69  |
| <b>VESA LOCAL BUS</b>                        |      |
| UMC 80486SX-33Mhz 256K VESA Local Bus.....   | £110 |
| Intel 80486SX-25Mhz 256K VESA Local Bus..... | £110 |
| Intel 80486SX-33Mhz 256K VESA Local Bus..... | £124 |
| Intel 80486SX-50Mhz 256K VESA Local Bus..... | £124 |
| Intel 80486DX-33Mhz 256K VESA Local Bus..... | £175 |
| Intel 80486DX-50Mhz 256K VESA Local Bus..... | £144 |
| Intel 80486DX-50Mhz 256K VESA Local Bus..... | £260 |
| Intel 80486DX-66Mhz 256K VESA Local Bus..... | £184 |
| Intel DX-75Mhz 256K VESA Local Bus.....      | £204 |
| Intel DX-100Mhz 256K VESA Local Bus.....     | £250 |

**AMD 80486DX2-80Mhz 256K VESA Local Bus.....£174**  
**AMD 80486DX4-100Mhz 256K VESA Local Bus.....£224**

All the Above motherboards have ZIF Socket &amp; are Pentium Upgradable

|   |      |
|---|------|
| <b>PCI</b>                                    |      |
| Intel 80486SX-50Mhz PCI Motherboard.....      | £148 |
| Intel 80486DX-33Mhz PCI Motherboard.....      | £199 |
| Intel 80486DX-50Mhz 256K PCI Motherboard..... | £168 |
| Intel 80486DX-66Mhz 256K PCI Motherboard..... | £204 |

All the Above motherboards have ZIF Socket &amp; are Pentium Upgradable

|   |      |
|---|------|
| Intel Pentium 60Mhz PCI Motherboard.....  | £315 |
| Intel Pentium 66Mhz PCI Motherboard.....  | £327 |
| Intel Pentium 75Mhz PCI Motherboard.....  | £393 |
| Intel Pentium 90Mhz PCI Motherboard.....  | £584 |
| Intel Pentium 100Mhz PCI Motherboard..... | £677 |

All the Above motherboards are Intel Manufactured with IDE &amp; I/O Built in

|  |     |
|--|-----|
| <b>MOTHERBOARD WITH NO CPU</b>                         |     |
| 486 VESA Local Bus M/B 256K Cache ZIF NCPU.....        | £65 |
| <i>(3 VESA, 4 ISA, 8 x 30 Pin Simms)</i>               |     |
| 486 VESA Local Bus M/B 256K Cache ZIF NCPU.....        | £65 |
| <i>(3 VESA, 4 ISA 4 x 30Pin &amp; 2 x 72Pin Simms)</i> |     |
| 486 VESA Local Bus M/B 256K Cache ZIF NCPU.....        | £69 |
| <i>(3 VESA, 4 ISA 4 x 30Pin &amp; 2 x 72Pin Simms)</i> |     |

|   |      |
|---|------|
| 486 PCI Motherboard NCPU.....                               | £89  |
| 486 PCI Multi I/O Motherboard NCPU.....                     | £99  |
| 80486DX EISA M/B 256K Cache NCPU.....                       | £229 |
| Pentium 60/66Mhz Motherboard with EIDE & Multi I/O.....     | £105 |
| Pentium 75/90/100Mhz Motherboard with EIDE & Multi I/O..... | £159 |

|                               |      |
|-------------------------------|------|
| <b>CPU's</b>                  |      |
| UMC 80486SX-33Mhz CPU.....    | £45  |
| Intel 80486SX-25Mhz CPU.....  | £45  |
| Intel 80486SX-33Mhz CPU.....  | £59  |
| Intel 80486SX-50Mhz CPU.....  | £59  |
| Intel 80486DX-33Mhz CPU.....  | £110 |
| Intel 80486DX-50Mhz CPU.....  | £79  |
| Intel 80486DX-50Mhz CPU.....  | £195 |
| Intel 80486DX-66Mhz CPU.....  | £115 |
| Intel 80486DX-75Mhz CPU.....  | £139 |
| Intel 80486DX-100Mhz CPU..... | £185 |
| AMD DX2-80Mhz CPU.....        | £109 |
| AMD 80486DX4-100Mhz CPU.....  | £165 |
| Pentium 60Mhz CPU.....        | £210 |
| Pentium 66Mhz CPU.....        | £222 |
| Pentium 75Mhz CPU.....        | £234 |
| Pentium 90Mhz CPU.....        | £425 |
| Pentium 100Mhz CPU.....       | £518 |

**OVERDRIVE CHIPS**

|  |      |
|--|------|
| Overdrive Chip 486SX-50.....   | £85  |
| Overdrive Chip 486DX-25.....   | £119 |
| Overdrive Chip 486DX-66.....   | £135 |
| Overdrive Chip 486DX-75.....   | £299 |
| Overdrive Chip 486DX-100.....  | £359 |
| Pentium Overdrive 63Mhz (Overdrive Chip for 25Mhz Motherboards)..... | £269 |

UPGRADE CHIPS TO 386 TO CYRIX 486

**Cyrix** Upgrade you 386 to a 486 for as little as £\*\*\*

|   |      |
|---|------|
| Upgrade 386SX 16/20 to 486SX 32/40..... | £142 |
| Upgrade 386SX 25 to 486SX 50.....       | £159 |
| Upgrade 386DX 16/20 to 486DX 32/40..... | £142 |
| Upgrade 386DX 25 to 486DX 50.....       | £159 |
| Upgrade 386DX 33 to 486DX 66.....       | £189 |

|                                   |     |
|-----------------------------------|-----|
| <b>486 HEAT SINK</b>              |     |
| 486 Heat Sink with Fan.....       | £9  |
| <b>DIAGNOSTIC BOARD</b>           |     |
| Motherboard Diagnostic Board..... | £15 |

**MEMORY**

|                                    |      |
|------------------------------------|------|
| 256K Simms 70ns.....               | £10  |
| 1Mb x 9 Sips 70ns 9 or 3 Chip..... | £45  |
| 1Mb x 9 Simms 70ns 3 Chip.....     | £28  |
| 1Mb x 9 Simms 70ns 9 Chip.....     | £39  |
| 4Mb x 9 Simms 70ns.....            | £109 |
| 1Mb x 32 Simms (4Mb).....          | £109 |
| 2Mb x 32 Simms (8Mb).....          | £219 |
| 4Mb x 32 Simms (16Mb).....         | £355 |
| 1Mb x 36 Simms (4Mb).....          | £115 |
| 2Mb x 36 Simms (8Mb).....          | £229 |
| 4Mb x 36 Simms (16Mb).....         | £395 |





## MONITORS

|   |        |
|---|--------|
| 14" Mono VGA Monitor.....                                   | £175   |
| 14" Crystal Colour SVGA Interlaced.....                     | £165   |
| 15" Crystal Colour Monitor N4 MPRII.....                    | £245   |
| 17" Crystal 17HQ 1280 x 1024 N4.....                        | £509   |
| <b>CTX</b>  |        |
| 14" CTX 1451LR N4 MPRII.....                                | £175   |
| 15" CTX CPS-1565GN N4 SVGA MPRII.....                       | £235   |
| 17" CTX 1765GM SVGA MPRII 28 1024 x 768.....                | £449   |
| 17" CTX 1785GM SVGA MPRII 26 1280 x 1024.....               | £495   |
| LMT 1000 16 Grey Scale LCD VGA Screen 9.4".....             | £499   |
| LMT 5020 4096 Colour LCD VGA Screen 9.4".....               | £1,999 |
| <i>All the above monitors come with on-site Warranty</i>    |        |
| <b>Sony</b>   |        |
| Sony 15" CPD5F1 1024 x 768 N1 25.....                       | £287   |
| Sony 17" GDM-17SEI SVGA N4.....                             | £815   |
| Sony 20" GDM-20SEV 1280 x 1024 N4.....                      | £1,295 |
| Sony 20" GDM-20SEI 1280 x 1024 N4.....                      | £1,459 |
| Sony CSS-B100 Computer Speaker System.....                  | £75    |
| <b>Philips</b>  |        |
| 14" Philips Mono Monitor.....                               | £89    |
| 14" Philips Enhanced VGA Color Monitor 14C.....             | £168   |
| 14" Philips Autocolor Color Monitor 14A.....                | £199   |
| 15" Philips Brilliance Autocolor Color Monitor 15B.....     | £254   |
| 15" Philips Brilliance Autocolor N4 Colour Monitor 15A..... | £285   |
| <i>(Built in Stereo for Multimedia Applications)</i>        |        |
| 17" Philips Autocolor Colour Monitor 17C.....               | £425   |
| <i>(Built in Stereo for Multimedia Applications)</i>        |        |
| 17" Philips Autocolor Colour Monitor 17B.....               | £569   |
| 20" Philips Autocolor Colour Monitor 20C.....               | £849   |
| 21" Philips Autocolor Colour Monitor 21B.....               | £1,439 |
| 21" Philips Brilliance Autocolor.....                       | £1,749 |
| <i>Colour Monitor with CyberScreen Technology 21A.....</i>  |        |

## NEC New NEC Multisync X Series - FullScan Flat Square Technology, Plug & Play & AccuColor Colour Control System.

|  |        |
|--|--------|
| NEC 2V 14" FST 1024 x 768 N-1.....           | £229   |
| NEC Multisync XV15 15" 1024 x 768 80Hz.....  | £280   |
| NEC Multisync XE15 15" 1024 x 768 80Hz.....  | £395   |
| NEC Multisync XV17 17" 1024 x 768 80Hz.....  | £569   |
| NEC Multisync XE17 17" 1024 x 768 80Hz.....  | £695   |
| NEC Multisync XP17 17" 1280 x 1024 76Hz..... | £935   |
| NEC Multisync XE21 21" 1152 x 1070 75Hz..... | £1,335 |
| NEC Multisync XP21 21" 1600 x 1200 70Hz..... | £1,759 |

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|--|--------|
| <b>Mitsubishi</b>                        |        |
| (MTS) 15" SD5520 Diamond Scan 15FS.....  | £339   |
| (MTS) 17" TFG8705 Diamond Pro 17TX.....  | £920   |
| (MTS) 21" THN9105 Diamond Pro 21TX.....  | CALL   |
| (MTS) 17" FFY7705 Diamond Scan 17FS..... | £595   |
| (MTS) 21" FFY7165 Diamond Pro21FS.....   | £1,385 |
| (MTS) 21" THZ8155 Diamond Tron 21T.....  | £1,335 |

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|---|--------|
| <b>Taxan</b>                                      |        |
| 14" Taxan Ergovision 400LR Interlaced.....        | £185   |
| 14" Taxan Ergovision 410LR N-1.....               | £195   |
| 14" Taxan Ergovision 420LR N-1.....               | £299   |
| 15" Taxan Ergovision 580 LR 1024x768 N-1.....     | £285   |
| 17" Taxan Ergovision 880 LR 1024x768 N-1.....     | £520   |
| 17" Taxan Ergovision 885 LR 1280x1024 N-1.....    | £625   |
| 17" Taxan Ergovision 895 LR 1280x1024 N-1.....    | £835   |
| 20" Taxan Ergovision 1080 1280 x 1024 N-1.....    | £910   |
| 21" Taxan Ergovision 2100 LR 1600 x 1200 N-1..... | £1,530 |

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|--|--------|
| <b>Panasonic</b>   |        |
| 15" Panasonic (TX-T1537) 1024 x 768 N1.....                  | £315   |
| 17" Panasonic (TX-D1732) 1024 x 768 N1 1280 x 1024 Max.....  | £335   |
| 17" Panasonic (TX-D1751) 1280 x 1024 N1.....                 | £775   |
| 20" Panasonic (TX-D2032) 1280 x 1024 N1.....                 | £1,125 |
| 21" Panasonic (TX-D2131) 1280 x 1024 N1 1600 x 1200 Max..... | £1,359 |
| <i>2 year On-Site Warranty on Panasonic Monitors</i>         |        |

|  |        |
|--|--------|
| <b>Viewsonic</b>                       |        |
| 14" Viewsonic 6E 1024 x 768 N-1.....   | £175   |
| 15" Viewsonic 15ES 1280 x 1024 N1..... | £255   |
| 17" Viewsonic 17 1280 x 1024 N1.....   | P.O.A. |
| 17" Viewsonic 172 1280 x 1024 N1.....  | £679   |
| 17" Viewsonic 17G 1280 x 1024 N1.....  | £549   |
| 20" Viewsonic V20 1600 x 1200 N1.....  | £1,039 |
| 21" Viewsonic 21 1600 x 1200 N-1.....  | £1,395 |

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|--|--------|
| <b>Liyama (IDEK)</b>                     |        |
| 15" Liyama Vision Master FST MF8115..... | £259   |
| 17" Liyama Vision Master FST MF8617..... | £549   |
| 21" Liyama Vision Master FST MF8221..... | £1,247 |
| 21" Liyama Vision Master FST MF9121..... | £1,317 |
| 21" Liyama Vision Master FST MF8621..... | £1,645 |

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|--|--------|
| <b>Hitachi</b>                           |        |
| Hitachi 17" 17MVX Value.....             | £495   |
| Hitachi 20" 20CM2096 1280 x 1024 N1..... | £1,025 |

|                                   |     |
|-----------------------------------|-----|
| <b>Accessories</b>                |     |
| 14" Anti Glare Screen Filter..... | £29 |

## HITACHI

### 17" 17MVX VALUE

- 1024 x 768 non interlaced resolution @ 75Hz, 1280 x 1024 @ 60Hz. 0.26mm dot pitch (0.225mm horizontal), Hitachi Natural Colours CRT.
- Advanced anti-static AR coating for high contrast, reduced glare. Microprocessor control with colour adjust. MPRII low radiation. EPA Energy Star & VESA DPMS power saving compliance with FREE Power Management software.
- 1 year Hitachi on-site replacement warranty.

**£495**



## SOFTWARE AND BOOKS

|   |     |
|---|-----|
| MS-DOS 6.22 Upgrade.....                | £38 |
| MS Win for Workgroups 3.11 Upgrade..... | £44 |
| MS Windows for Workgroups 3.11.....     | £89 |
| D.I.Y. Book.....                        | £5  |

All the information you need to build or update a PC



## VGA CARDS

|   |      |
|---|------|
| <b>ISA</b>                                    |      |
| <b>Hercules</b>                               |      |
| 1Mb Hercules Dynamite Pro.....                | £145 |
| <b>Diamond</b>                                |      |
| 2Mb Diamond Speedstar 64.....                 | £145 |
| 1Mb Diamond Speedstar 64.....                 | £115 |
| <b>Taxan</b>                                  |      |
| 4Mb Taxan WinTurbo 64.....                    | £395 |
| 2Mb Taxan WinTurbo 64.....                    | £245 |
| 2Mb Taxan GTS WinBoost.....                   | £145 |
| 1Mb Taxan GTS WinBoost.....                   | £119 |
| <b>Matrox</b>                                 |      |
| 2Mb MGA Impression Plus ISA.....              | £259 |
| 2Mb MGA Impression Plus 200/220.....          | £309 |
| <b>Orchid</b>                                 |      |
| 2Mb Kelvin 64.....                            | £135 |
| 1Mb Kelvin 64.....                            | £98  |
| <b>Techworks</b>                              |      |
| 1Mb Thunderbolt.....                          | £59  |
| 1Mb Warp 20 VRAM.....                         | £139 |
| 2Mb Warp 20-2 VRAM.....                       | £189 |
| <b>Generic</b>                                |      |
| 1Mb Tseng ET4000 16.7m Colours.....           | £65  |
| 1Mb Cirrus Logic 16.7 Win Accelerator.....    | £49  |
| 1Mb Trident 8900D 1024 x 768 256C.....        | £44  |
| 512K VGA 1024 x 768 16C.....                  | £26  |
| 256K VGA 800 x 600 16C.....                   | £22  |
| <b>VESA LOCAL BUS</b>                         |      |
| <b>Hercules</b>                               |      |
| 4Mb Hercules Graphite Terminator 64 VLB.....  | £430 |
| 2Mb Hercules Graphite Terminator 64 VLB.....  | £280 |
| 2Mb Hercules Dynamite Power VLB.....          | £180 |
| 1Mb Hercules Dynamite Pro VLB.....            | £140 |
| 1Mb Hercules Stingray VLB.....                | £100 |
| <b>Taxan</b>                                  |      |
| 4Mb Taxan WinTurbo 64 VLB.....                | £395 |
| 2Mb Taxan WinTurbo 64 VLB.....                | £245 |
| 2Mb Taxan GTS WinBoost VLB.....               | £145 |
| 1Mb Taxan GTS WinBoost VLB.....               | £119 |
| <b>Diamond</b>                                |      |
| 4Mb Diamond Stealth 64 Vram VLB.....          | £340 |
| 2Mb Diamond Stealth 64 Vram VLB.....          | £230 |
| 2Mb Diamond Stealth 64 Vram VLB.....          | £135 |
| 1Mb Diamond Stealth 64 Vram VLB.....          | £95  |
| <b>Matrox</b>                                 |      |
| 2Mb MGA Impression Plus VLB.....              | £330 |
| 2Mb MGA Impression Lite VLB.....              | £195 |
| <b>Orchid</b>                                 |      |
| 4Mb Orchid Fahrenheit Pro 64 VLB.....         | £349 |
| 2Mb Orchid Fahrenheit Pro 64 VLB.....         | £245 |
| 2Mb Orchid Fahrenheit 64 VLB.....             | £159 |
| 1Mb Orchid Fahrenheit 64 VLB.....             | £119 |
| 2Mb Orchid Kelvin 64 VLB.....                 | £135 |
| 1Mb Orchid Kelvin 64 VLB.....                 | £99  |
| 1Mb Orchid Kelvin EZ VLB.....                 | £89  |
| <b>Spa</b>                                    |      |
| 2Mb Spa V7 Mercury P64 VLB.....               | £239 |
| 1Mb Spa Videoseven Mirage P64 VLB.....        | £125 |
| 1Mb Spa Videoseven Mirage VLB.....            | £85  |
| <b>STB</b>                                    |      |
| 4Mb STB Velocity 64V MPEG.....                | £395 |
| 2Mb STB Velocity 64V MPEG.....                | £245 |
| 2Mb Lightspeed VLB.....                       | £145 |
| 1Mb Powergraph VLB-24.....                    | £145 |
| <b>TECHWORKS</b>                              |      |
| 1Mb Thunderbolt VL.....                       | £99  |
| 2Mb Thunderbolt VL.....                       | £139 |
| <b>Videologic</b>                             |      |
| 1Mb GraphiStar 300 VLB.....                   | £99  |
| 2Mb GraphiStar 300 VLB.....                   | £139 |
| 1Mb GraphiStar 500 VLB (inc AVI Scaling)..... | £135 |
| 2Mb GraphiStar 500 VLB (inc AVI Scaling)..... | £189 |
| <b>Generic</b>                                |      |
| 2Mb Cirrus Logic ET4000/W32 VLB.....          | £109 |
| 1Mb Tseng ET4000/W32P VLB.....                | £79  |
| 2Mb Tseng ET4000/W32P VLB.....                | £109 |
| 1Mb Advanced Logic AL2301 PCI.....            | £89  |
| 1Mb Cirrus Logic 5434 PCI.....                | £79  |

## TECHWORKS

1Mb Thunderbolt-T PCI.....£89

2Mb Thunderbolt-T PCI.....£139

|   |      |
|---|------|
| <b>Videologic</b>                             |      |
| 1Mb GraphiStar 300 PCI.....                   | £99  |
| 2Mb GraphiStar 300 PCI.....                   | £139 |
| 1Mb GraphiStar 500 PCI (inc AVI Scaling)..... | £135 |
| 2Mb GraphiStar 500 PCI (inc AVI Scaling)..... | £189 |
| <b>Generic</b>                                |      |
| 2Mb Cirrus Logic 5434 PCI.....                | £115 |
| 1Mb Tseng ET4000/W32P PCI.....                | £79  |
| 2Mb Tseng ET4000/W32P PCI.....                | £109 |
| 1Mb Advanced Logic AL2301 PCI.....            | £89  |
| 1Mb Cirrus Logic 5434 PCI.....                | £79  |



## SCANNERS

|   |        |
|---|--------|
| Logitech Scanman 32 DOS.....  | £60    |
| Logitech Scanman 32 WIN.....  | £60    |
| Logitech Scanman 32 WIN and PagePlus V3.0.....  | £79    |
| Logitech 256 Scanner.....   | £78    |
| Logitech Scanman Colour.....  | £165   |
| Logitech Easy Touch Scanner.....  | £105   |
| Logitech Scanman Power Page.....  | £299   |
| Dexa Sheetfed Colour Scanner.....   | £225   |
| Dexa Handheld Colour Scanner.....   | £129   |
| Sicos Colour Page Scanner.....  | £239   |
| Trust 1200dpi Flatbed Scanner.....  | £149   |
| Trust 2400dpi Flatbed Scanner.....  | £399   |
| ScanFX - Scanner, Fax, Copier.....  |        |
| <i>(Colour/BW 1200 x 1200dpi Scanner with Fax &amp; Copying. Comes with Wordcan OCR &amp; Picture Publisher LE)</i> |        |
| Andest FaxScanner (Windows).....  | P.O.A. |
| <i>(Converts Fax Machine into A4 Scanner)</i>   |        |
| Epson GT6500 Parallel.....  | £445   |
| <i>(Photoshop LE, Omnigage Direct, Pagekeeper)</i>  |        |
| Epson GT6500 SCSI.....  | £515   |
| <i>(Photoshop LE, Omnigage Direct, Pagekeeper)</i>  |        |
| Epson GT 6500 SCSI (Adobe Photoshop V2.51).....   | £669   |
| Epson GT8000 Parallel.....  | £569   |
| <i>(Photoshop LE, Omnigage Direct, Pagekeeper)</i>  |        |
| Epson GT8000 SCSI.....  | £635   |
| <i>(Photoshop LE, Omnigage Direct, Pagekeeper)</i>  |        |
| Epson GT8000 SCSI (Adobe Photoshop V2.51).....  | £855   |
| Epson GT9000 SCSI.....  | £855   |
| <i>(Photoshop LE, Omnigage Direct, Pagekeeper)</i>  |        |
| Epson GT9000 SCSI (Adobe Photoshop V2.51).....  | £1,025 |
| Epson Bi-Directional Parallel Port.....   | £35    |



## MODEMS

## US Robotics SPORTSTER

|   |      |
|---|------|
| US Robotics Sportster 28.8 V34 Fax EXT..... | £195 |
| US Robotics Sportster 28.8 V34 Fax INT..... | £195 |
| US Robotics Sportster 14.4 Fax EXT.....     | £129 |
| US Robotics Sportster 14.4 INT.....         | £129 |

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|--|--------|
| <b>RoadRunner Rocket Bundles</b>   |        |
| Silver Pack.....   | £119   |
| <i>(Includes V32bis Modem, Serial Cable, BT Lead, PSU, no Software)</i>  |        |
| Gold Pack.....   | £135   |
| <i>(As above plus BT T-Piece, 925 way adaptor and Trans-Send WinDOS Lite Software)</i>   |        |
| Gold RocketBoard Bundle.....   | £149   |
| <i>(As Gold Pack plus Rocketboard dual 16C550 High Speed Serial Card)</i>  |        |
| Platinum Pack.....   | £169   |
| <i>(As Gold Pack but with 19,200bps V32Terbo RoadRunner Rocket)</i>  |        |
| <b>Andest VPA V22 BIS</b>  |        |
| Andest VPA V32 BIS + RocketBoard.....  | £449   |
| Andest RocketBoard - High Speed 16C550 Serial Card.....  | £59    |
| US Robotics Worldport Dual Standard Cellular.....  | £168   |
| US Robotics Worldport 2496 + Fax PCMCIA.....   | £129   |
| <b>Simply Modems</b>   |        |
| Simply 14400 PCMCIA Fax Modem.....   | £219   |
| Simply V34 External Fax Modem.....   | £179   |
| Simply V34 Internal Fax Modem.....   | £179   |
| Simply 14400 Internal Fax Modem.....   | £109   |
| Simply 14400 External Fax Modem.....   | £109   |
| Simply 9624 Pocket Fax Modem.....  | £58    |
| <i>Simply Modems are BATT approved and come with Windows software.</i>   |        |
| <b>Pison Diacom</b>  |        |
| Gold Card V34 + Fax PCMCIA Modem.....  | £315   |
| Gold Card V32 bis + Fax PCMCIA Modem.....  | £215   |
| <b>Pace</b>  |        |
| Pace Microlin fx 34 PC Internal Fax Modem.....   | P.O.A. |
| Pace Linnet 34 fx Desktop V34 Fax Modem.....   | P.O.A. |
| Pace Microlin fx 34 Pocket Fax Modem.....  | P.O.A. |
| Pace Microlin FX 34 PCMCIA V34 Fax Modem.....  | P.O.A. |
| Pace Microlin FX 32 Plus Internal Fax Modem.....   | £143   |
| Pace Linnet 32 Plus fx V32 Desktop Fax Modem.....  | P.O.A. |
| Pace Microlin FX32 Plus Pocket Fax Modem.....  | £169   |
| Pace Microlin FX NB 32 Plus PCMCIA Fax Modem.....  | £229   |
| Pace Message Desk.....   | P.O.A. |
| <i>(Voice functionality integrated with Data and Fax. Fax Back &amp; Fax Forward with enhanced audio standard, Internal Microphone)</i>  |        |
| <b>Hayes</b>   |        |
| Hayes Optima 28.8 VFC & Fax.....   | £449   |
| Hayes Optima 288 VFC + Fax Value Pack.....   | £749   |
| <i>Hayes Optima 288 - 2 Enhanced Series Ports (Free upgrade to V34)</i>  |        |
| Hayes Optima 14.4 + Fax 144.....   | £309   |
| Hayes Optima 144 - Fax 144 PCMCIA.....   | £225   |
| Hayes Accura 28.8 + Fax VFC V32bis.....  | £225   |
| Hayes Accura 14.4 + Fax V32bis.....  | £165   |
| <i>(The above Modems APPROVED for connection to telecommunications systems specified in the instructions subject to the conditions set out in them.)</i>                           |        |
| External 14400 Fax/Modem.....  | £110   |
| Internal 14400 Fax/Modem.....  | £69    |
| Internal 9624 Fax/Modem.....   | £35    |
| <i>(The above modems are prohibited from direct or indirect connection to public telecommunications systems. Action may be taken against anyone so connecting this apparatus.)</i> |        |
| <b>Cables</b>  |        |
| 9 to 25 Pin Modem Cable.....   | £9     |
| 25 to 25 Pin Modem Cable.....  | £9     |
| <b>Automatic Fax Switches</b>  |        |
| Andest MSL Manager 1100 Fax/Phone.....   | £89    |
| Andest MSL Manager 3300.....   | £105   |
| Andest MSL Manager 3300M.....  | £125   |
| Andest MSL Manager 7700.....   | £145   |





## PRINTERS

### Hewlett Packard

|  |        |
|--|--------|
| Deskjet                                    |        |
| HP Deskjet 540 (upgradable to colour)..... | £205   |
| HP Deskjet 560C.....                       | £319   |
| HP Deskjet 650.....                        | £337   |
| HP Deskjet 850.....                        | £395   |
| HP Deskjet 1200C.....                      | £625   |
| HP Deskjet 1200C Postscript.....           | £985   |
| HP Deskjet 1600C.....                      | £833   |
| HP Deskjet 1600CM.....                     | £1,224 |
| HP Deskjet 320.....                        | £165   |
| HP Deskjet 320 & Sheetfeeder.....          | £199   |
| HP Deskjet 320/540 Colour Kit.....         | £28    |

### Laser Printer

|  |        |
|--|--------|
| HP Laserjet 4L.....                              | £355   |
| HP Laserjet 4 Plus.....                          | £938   |
| HP Laserjet 4M Plus.....                         | £1,258 |
| HP Laserjet 4Si.....                             | £2,085 |
| HP Laserjet 4Si: MX.....                         | £2,965 |
| HP Laserjet 4V A3 Laser Printer.....             | £1,370 |
| HP Laserjet 4MV A3 Postscript Laser Printer..... | £1,975 |
| HP Colour Laserjet.....                          | £4,279 |

### Paintjets

|                                    |        |
|------------------------------------|--------|
| HP Paintjets XL300.....            | £1,595 |
| HP Paintjets XL300 Postscript..... | £2,575 |

### HP Support Pack

|  |      |
|--|------|
| Support Pack Deskjet Mono, Portable.....   | £40  |
| Support Pack Deskjet 540.....              | £40  |
| Support Pack Deskjet Colour 660/850.....   | £65  |
| Support Pack 4L, 4ML, 1200C/TS, Pjets..... | £100 |
| Support Pack 4P, Scanjets 5P.....          | £135 |
| Support Pack HP4, 4M.....                  | £170 |
| Support Pack 4Si/MX.....                   | £505 |

### Epson

|  |        |
|--|--------|
| Epson LX300 9 Pin Dot Matrix.....                | £88    |
| Epson LX100 9 Pin Dot Matrix.....                | £108   |
| Epson LX1050 9 Pin Dot Matrix.....               | £172   |
| Epson FX870 9 Pin Dot Matrix.....                | £221   |
| Epson FX1170 9 Pin Dot Matrix.....               | £279   |
| Epson LQ100 24 Pin Dot Matrix.....               | £97    |
| Epson LQ150 Mono 24Pin Dot Matrix.....           | £112   |
| Epson LQ300 24 Pin Dot Matrix.....               | £142   |
| Epson LQ570+ 24 Pin Dot Matrix.....              | £183   |
| Epson LQ1070+ 24 Pin Dot Matrix.....             | £283   |
| Epson LQ870 24 Pin Dot Matrix.....               | £352   |
| Epson LQ1170 24 Pin Dot Matrix.....              | £401   |
| Epson Stylus 800+.....                           | £168   |
| Epson Stylus 1000.....                           | £311   |
| Epson Stylus Colour.....                         | £323   |
| Epson SQ870 Ink Jet Printer.....                 | £415   |
| Epson SQ1170 Ink Jet.....                        | £560   |
| Epson EPL3000 4PPM Laser Printer.....            | £389   |
| Epson EPL5200 6PPM Laser Printer.....            | £462   |
| Epson EPL6000 6PPM Laser Printer 600dpi.....     | £594   |
| Epson EPL9000 12PPM A3 Laser Printer 600dpi..... | £1,885 |

### Canon

|                                       |        |
|---------------------------------------|--------|
| Canon BJ200EX Printer.....            | £183   |
| Canon BJ230 Printer.....              | £242   |
| Canon BJ300 80 Column Bubblejet.....  | £360   |
| Canon BJ330 136 Column Bubblejet..... | £399   |
| Canon BJC4000 Colour.....             | £269   |
| Canon BJC600 Colour Inkjet.....       | £335   |
| Canon BJC800 Colour Bubblejet.....    | £1,065 |

### Brother

## THE LOWEST COST, TRUE 600 DPI LASER

- 600dpi
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- PCL 5e
- Postscript 2 option
- Straight paper path
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**ONLY £495**



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| Brother HL-630 6PPM Windows Printer.....    | £327 |
| Brother HL-6 Laser Printer.....             | £409 |
| Brother HL-4VE 4PPM Laser Printer.....      | £549 |
| Brother HL1260 1200dpi 12PPM B&W Laser..... | £999 |

### NEC

|   |      |
|---|------|
| NEC Superscript 610 Plus 6PPM Laser.....    | £289 |
| NEC Superscript 660 6PPM Laser.....         | £415 |
| NEC Superscript 660i 6PPM Laser.....        | £565 |
| NEC Superscript Colour 3000 1PPM Laser..... | £639 |

### OKI

|  |      |
|--|------|
| OKI OL400ex 4PPM Laser Printer.....        | £299 |
| OKI OL410ex 4PPM 600dpi Laser Printer..... | £399 |

### Olivetti

|                                    |      |
|------------------------------------|------|
| Olivetti JP360C Colour Inkjet..... | £199 |
|------------------------------------|------|

### Star

|                                      |      |
|--------------------------------------|------|
| Star Wintype 4000 Laser Printer..... | £295 |
|--------------------------------------|------|

### Panasonic

|  |        |
|--|--------|
| Dot Matrix                                       |        |
| Panasonic KX-P1150 9 Pin Dot Matrix.....         | £89    |
| Panasonic KX-P2023 24 Pin Mono Dot Matrix.....   | £108   |
| Panasonic KX-P2124 24 Pin Mono Dot Matrix.....   | £198   |
| Panasonic KX-P2124 24 Pin Colour Dot Matrix..... | £236   |
| Panasonic KX-P2135 24 Pin Colour Printer.....    | £135   |
| Panasonic KX-P3626 24 Pin Mono Dot Matrix.....   | P.O.A. |

### Laser

|  |        |
|--|--------|
| Panasonic KX-P4100 6ppm GDI Laser Printer..... | P.O.A. |
| Panasonic KX-P4400 4PPM Laser Printer.....     | £270   |
| Panasonic KX-P4401 4PPM Laser Printer.....     | £338   |
| Panasonic KX-P4430 5PPM Laser Printer.....     | £529   |
| Panasonic KX-P4440 10PPM Laser Printer.....    | £708   |
| Panasonic KX-P5400 4PPM Laser Printer.....     | £542   |

**ALL PRINTERS ARE SUPPLIED  
WITH FREE PARALLEL CABLE**



## NETWORK ACCESORIES



**NOVELL  
APPROVED**

|  |      |
|--|------|
| Simply NE2000 Compatible 16 Bit BNC.....             | £25  |
| Simply NE2000 Compatible 16 Bit RJ45.....            | £25  |
| Simply NE2000 Compatible 16 Bit Combo Card ISA.....  | £28  |
| Simply NE2000 Compatible 32 Bit Combo Card VLB.....  | £79  |
| Simply NE2000 Compatible 32 Bit Combo Card PCI.....  | £89  |
| Simply NE3200 Compatible EISA 32 Bit Combo Card..... | £159 |
| Simply NE2000 Boot Rom.....                          | £5   |

All the Above Cards are Novell Approved

### Novell

|  |      |
|--|------|
| Novell NE1000 8 bit ISA.....                             | £75  |
| Novell NE2000 Plus 16 Bit BNC.....                       | £75  |
| Novell NE2000 Plus 16 Bit RJ45.....                      | £75  |
| Novell NE2000 Plus 16 Bit Combo Card.....                | £85  |
| Novell NE2000 Plus 5 Pack 16 bit either RJ45 or BNC..... | £340 |

### JCom

|   |      |
|---|------|
| 3COM Etherlink III 3C509 ISA BNC.....                       | £75  |
| 3COM Etherlink III 3C509 ISA RJ45.....                      | £75  |
| 3COM Etherlink III 3C509 ISA RJ45 / BNC Combo.....          | £85  |
| 3COM Etherlink III 3C509 ISA either BNC or RJ45 5 Pack..... | £339 |
| 3COM Etherlink III 3C509 ISA RJ45 / BNC Combo 5 Pack.....   | £399 |
| 3COM Etherlink III 3C579 EISA BNC.....                      | £140 |
| 3COM Etherlink III 3C579 EISA RJ45.....                     | £140 |
| 3COM Etherlink III 3C589 PCMCIA RJ45.....                   | £140 |
| 3COM Etherlink III 3C589 PCMCIA RJ45 & BNC.....             | £149 |

### SMC Ethercard

|  |        |
|--|--------|
| SMC Elite Ultra ISA RJ45.....                    | £62    |
| SMC Elite Ultra ISA BNC.....                     | £62    |
| SMC Elite Ultra ISA Combo RJ45 & BNC.....        | £70    |
| SMC PCI Ethernet Adaptor.....                    | £129   |
| SMC PCI Ethernet Adaptor 5 Pack.....             | £595   |
| SMC Elite Ultra ISA RJ45 6 Pack.....             | £315   |
| SMC Elite Ultra ISA BNC 6 Pack.....              | £349   |
| SMC Elite Ultra ISA Combo RJ45 & BNC 6 Pack..... | £389   |
| SMC Elite Ultra EISA 32C BNC & RJ45.....         | £159   |
| SMC EtherEZ ISA RJ45.....                        | P.O.A. |
| SMC EtherEZ ISA BNC.....                         | P.O.A. |
| SMC EtherEZ ISA Combo RJ45 & BNC.....            | P.O.A. |
| SMC EtherEZ ISA RJ45 or BNC 5 Pack.....          | P.O.A. |
| SMC EtherEZ ISA Combo RJ45 & BNC 5 Pack.....     | P.O.A. |

### Intel

|  |      |
|--|------|
| INTEL Etherexpress ISA 16 BNC.....             | £73  |
| INTEL Etherexpress ISA 16 RJ45.....            | £73  |
| INTEL Etherexpress ISA Flash Combo.....        | £89  |
| INTEL Etherexpress ISA 16 BNC 5 Pack.....      | £385 |
| INTEL Etherexpress ISA 16 RJ45 5 Pack.....     | £385 |
| INTEL Etherexpress ISA Flash Combo 5 pack..... | £445 |

### D Link

|  |      |
|--|------|
| D Link DE620CCT Pocket Adapter BNC/TP.....         | £145 |
| D Link DE6201 Pocket Adapter Token Ring.....       | £345 |
| D Link DE650C PCMCIA Ethernet BNC.....             | £139 |
| D Link DE650T PCMCIA Ethernet TP.....              | £139 |
| D Link DE220 Ethernet Card BNC/AUI.....            | £69  |
| D Link DE220TP Ethernet Card TP/AUI.....           | £69  |
| D Link DE220CAT Ethernet Card BNC / TP / AUI.....  | £89  |
| D Link DE320 MCA Ethernet Card TP/AUI.....         | £99  |
| D Link DE400 EISA Ethernet Card BNC/TP/AUI.....    | £149 |
| D Link DE500CAT VESA Ethernet Card BNC/TP/AUI..... | £199 |
| D Link DE530CT PCI Ethernet Card BNC/TP.....       | £99  |
| D Link DT220 Token Ring ISA.....                   | £229 |
| D Link DT320 Token Ring ISA.....                   | £229 |

### Ethernet Hubs

|                                       |        |
|---------------------------------------|--------|
| Simply 8 Port TP Hub BNC or AUI.....  | £175   |
| Simply 12 Port TP Hub BNC or AUI..... | £325   |
| Simply 12 Port TP Hub BNC or AUI..... | £345   |
| D Link DE-1200 SNMP 12 Port RJ45..... | P.O.A. |
| D Link DE-1600 SNMP 12 Port RJ45..... | P.O.A. |
| SMC Tiger Hub 16 Port.....            | £285   |
| SMC 3812 12 Port Hub.....             | £495   |

### Repeaters

|                                     |      |
|-------------------------------------|------|
| D-Link Repeater 2 Port BNC/AUI..... | £295 |
| D-Link Repeater 4 Port BNC/AUI..... | £395 |
| D-Link Repeater 8 Port BNC/AUI..... | £445 |
| Allied Telesis 2 Port Repeater..... | £495 |
| Allied Telesis 4 Port Repeater..... | £659 |

### Transceivers

|   |      |
|---|------|
| Allied Telesis Micro Transceiver.....           | £35  |
| Chase Research IOPRINT2 BNC 4 Ports 2S 2P.....  | £495 |
| Chase Research IOPRINT2 RG45 4 Ports 2S 2P..... | £495 |
| Chase Research IOPRINT2 jr RG45 Parallel.....   | £195 |
| Chase Research IOPRINT2 jr BNC Parallel.....    | £195 |
| Chase Research IOPRINT2 jr Combo Parallel.....  | £225 |

### Connectors

|                                    |     |
|------------------------------------|-----|
| BNC Crimp Plugs.....               | £1  |
| BNC T-Connector.....               | £5  |
| BNC Terminator.....                | £4  |
| BNC In-Line Coupler.....           | £2  |
| RJ45 Crimp Plug.....               | £1  |
| Single BNC Outlet (FacePlate)..... | £3  |
| Dual BNC Outlet (FacePlate).....   | £5  |
| Dual RG45 Outlet (FacePlate).....  | £12 |
| EAD Thinwire Tap Outlet.....       | £24 |
| EAD Thinwire drop Lead 2M.....     | £26 |
| EAD Thinwire drop Lead 5M.....     | £36 |

### Professional Tools

|                              |     |
|------------------------------|-----|
| BNC Crimp Tool.....          | £29 |
| Ethernet Cable Stripper..... | £15 |
| RJ45 Crimp Tool.....         | £75 |

### Cables

|                                      |        |
|--------------------------------------|--------|
| RJ45 & BNC Cables made to order..... | P.O.A. |
|--------------------------------------|--------|

### UPS Systems

|  |      |
|--|------|
| APC BK250-250 VA Backup.....             | £89  |
| APC BK400-400VA Backup.....              | £135 |
| APC BK600-600 VA Backup.....             | £189 |
| APC BK900-900 VA Backup.....             | £335 |
| APC BK1250-1250 VA Backup.....           | £425 |
| APC AP250-250 VA Backup.....             | £195 |
| APC AP400-400VA Smart.....               | £215 |
| APC AP600-600VA Smart.....               | £415 |
| APC AP900-900VA Smart.....               | £565 |
| APC AP1250-1250VA Smart.....             | £925 |
| APC AP2000-2000VA Smart.....             | £149 |
| PowerChute Software 4.2 Novell.....      | £49  |
| PowerChute Software 4.2 LAN Manager..... | £49  |
| PowerChute Software 4.2Unix.....         | £69  |



## CO-PROCESSORS

|   |     |
|---|-----|
| 80287-20Mhz Co-Processor.....           | £45 |
| 387SX-25Mhz/SX-20Mhz/SX-16Mhz CO-P..... | £42 |
| 80387SX-33Mhz Co-Processor.....         | £44 |
| 80387SX-40Mhz Co-Processor.....         | £44 |
| 80387DX-33Mhz Co-Processor.....         | £44 |
| 80387DX-40Mhz Co-Processor.....         | £45 |



## CASES



|   |     |
|---|-----|
| Deluxe Desktop Case with LED.....             | £35 |
| Deluxe Mini Tower Case with LED.....          | £35 |
| Deluxe Slim-Line Case.....                    | £49 |
| Deluxe Large Mini Tower Case with LED.....    | £59 |
| Deluxe Midi Tower Case.....                   | £59 |
| Deluxe Desktop Multi Media Case 200 Watt..... | £75 |
| Deluxe Full Tower Case with LED.....          | £75 |

All the Above cases come with 200 Watt PSU's & all Screens & Cables

### REPLACEMENT PSUs

|                                |     |
|--------------------------------|-----|
| 200W PSU for any case.....     | £35 |
| 230W PSU for any case.....     | £45 |
| 300 Watt PSU for any case..... | £55 |

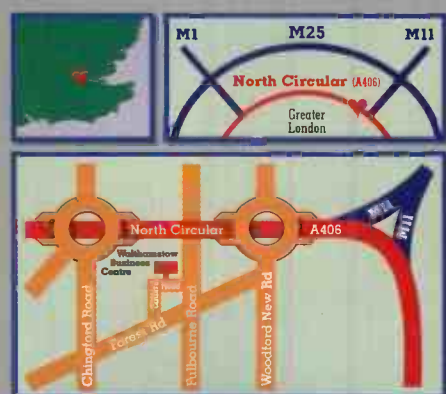
|                              |                      |
|------------------------------|----------------------|
| <b>General Sales Line</b>    | <b>0181 523 4020</b> |
| <b>Software Sales</b>        | <b>0181 498 2120</b> |
| <b>PC Systems Sales Line</b> | <b>0181 498 2130</b> |
| <b>Customer Services</b>     | <b>0181 498 2160</b> |
| <b>Technical Support</b>     | <b>0181 498 2170</b> |
| <b>Accounts</b>              | <b>0181 498 2190</b> |
| <b>Fax</b>                   | <b>0181 523 4002</b> |

### April 1995 Price List

All sales are subject to our standard terms and conditions. All prices exclude VAT and Delivery. E&OE. Prices are correct at time of going to press.

We welcome Official Purchase Orders from customers in the Public Sector/Education establishments and listed PLCs. All other orders are accepted on a cash with order basis. We accept cash, cheques (7 days clearance) and all major credit & debit cards.

PLEASE NOTE: Prices are changing so rapidly they can go up or down at any time. We will always endeavour to offer you the best prices. We aim to offer all goods from stock. Orders received before 15.00 will be despatched the same day. Our carriage charges are as follows: 1st Class Recorded Post.....£5 (dependent upon the number of parcels). If we haven't got the goods in stock, you will be informed by our salesperson before taking your order. You will be given the expected shipping date. With the exception of mice and joysticks, all our goods are supplied with 12 months RTB warranty. And there's a 14 day "no-quibble" money back guarantee on all goods except printers. This guarantee only applies to unopened software packages.



**Showroom Opening Times:**  
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**Simply  
COMPUTERS**  
HOTLINE 0181 523 4020

Simply Computers Ltd,  
28 Walthamstow Business Centre, Clifford  
Road, Walthamstow, London E17 4SX.



# SOFTWARE



## ACCOUNTS

|   |      |
|---|------|
| MoneyBox Accounts Software                    | £39  |
| CA Simply Accounting                          | £49  |
| Intuit QuickBooks V2.0                        | £87  |
| Pegasus Solo                                  | £62  |
| Pegasus Solo Payroll                          | £42  |
| Sage Instant Accounting                       | £89  |
| Sage Instant Business Pack                    | £119 |
| Sage Instant Payroll                          | £72  |
| Sage Sterling Accountant + 2 V2.1             | £190 |
| Sage Sterling Accountant V.7                  | £161 |
| Sage Sterling +2 Accountant Plus              | £274 |
| Sage Sterling Accountant Plus V.7             | £242 |
| Sage Sterling +2 Bookkeeper                   | £84  |
| Sage Sterling Bookkeeper V7                   | £55  |
| Sage Sterling +2 Financial Controller         | £354 |
| Sage Sterling Financial Controller V7         | £319 |
| Sage Sterling Network Financial Controller V7 | £499 |
| Sage Sterling +2 Network Financial Controller | £549 |
| Sage Sterling Job Costing V5                  | £124 |
| Sage Sterling +2 Payroll                      | £130 |
| Sage Sterling Payroll II V5                   | £130 |
| Sage Sterling Network Payroll                 | £166 |
| TAS Books                                     | £78  |
| TAS Books Multi User                          | £169 |
| TAS Books Payroll                             | £79  |
| Quicken Deluxe Business Pack                  | £45  |
| Quicken Deluxe Home Pack                      | £45  |
| <b>PERSONAL FINANCE</b>                       |      |
| Intuit Quicken for Windows 3.0                | £29  |
| Intuit QuickInvoice                           | £29  |
| Intuit QuickTax                               | £35  |
| Intuit Home Inventory                         | £19  |
| MS Money                                      | £25  |
| Sage Moneywise                                | £25  |



## DATABASES

|                                      |      |
|--------------------------------------|------|
| Borland Dbase V5 for Windows on CD   | £225 |
| Borland Dbase V5 for DOS             | £324 |
| Borland Dbase V5 Competitive Upgrade | £125 |
| CA Clipper V5.2                      | £289 |
| Claris Filemaker Pro V2.1            | £88  |
| DataEase V4.53 DOS                   | £389 |
| Lotus Approach 3.0 Win               | £82  |
| MS Access V2.0                       | £218 |
| MS Access V2.0 CCP Upgrade           | £78  |
| MS Access V2.0 Competitive Upgrade   | £128 |
| MS FoxPro V2.6 DOS                   | £73  |
| MS FoxPro V2.6 Win                   | £274 |
| MS FoxPro V2.6 Win Professional      | £276 |
| Paradox V5 DOS                       | £325 |
| Paradox V5 Win                       | £233 |



## DESKTOP PUBLISHING

|   |      |
|---|------|
| Aldus Pagemaker Classic   | £53  |
| Aldus Pagemaker V5.0 Win  | £394 |
| Corel Ventura V5  | £245 |
| MS Publisher for Windows V2.0   | £62  |
| MS Publisher Design Pack  | £28  |
| Quark Xpress V3.3   | £569 |
| PagePlus V3.0   | £45  |
| GST Pressworks 2  | £65  |
| GST Pressworks POWERpack  | £59  |
| <i>(Includes Pressworks2, Headline fonts, Clipart Portfolio, Power Table)</i> |      |
| GST Headline Font Collection  | £17  |
| GST Clipart Portfolio   | £22  |
| GST PowerTable  | £22  |



## EDUCATION ON 3.5"

|                                     |     |
|-------------------------------------|-----|
| Bodyworks on 3.5"                   | £29 |
| Chemistry Works on 3.5"             | £39 |
| Mavis Beacon V2 for Windows on 3.5" | £19 |



## EDUCATION ON CD

|                                     |     |
|-------------------------------------|-----|
| <b>COMPTONS</b>                     |     |
| Interactive Encyclopedia 1995 MPC   | £39 |
| <b>GROLIER</b>                      |     |
| Encyclopedia 1995                   | £75 |
| <b>GUILDISOFT</b>                   |     |
| Guidisoft 3D Body Adventure         | £27 |
| Guidisoft 3D Dinosaur Adventure     | £27 |
| Guidisoft Bugs, An Insect Adventure | £27 |
| Guidisoft Dr T's Sing-a-Long CD     | £27 |
| Guidisoft Fitness Partner           | £35 |
| Guidisoft Science Adventure         | £27 |
| Guidisoft Undersea Adventure        | £27 |
| Guidisoft 7000 Clipart Images       | £12 |
| Guidisoft 4000 Icons                | £12 |
| Guidisoft 500 Fonts for Windows     | £12 |

|   |     |
|---|-----|
| <b>MICROSOFT</b>  |     |
| MS Encarta 95   | £57 |
| MS Bookshelf 1994   | £59 |
| MS Art Gallery  | £30 |
| MS Ancient Lands  | £30 |
| MS Dangerous Creatures  | £30 |
| MS Cinemania 95   | £30 |
| MS Dinosaurs  | £30 |
| MS Musical Instruments  | £30 |
| MS Strauss Three Tone Poems                                   | £30 |
| MS Beethoven 9th Symphony                                     | £30 |
| MS Mozart The Spring Quarter                                  | £30 |
| MS Stravinsky's Rite of Spring                                | £30 |
| MS Golf   | £24 |
| MS Works on CD  | £85 |
| MS Magic School Bus/Solar System                              | £30 |
| MS Magic School Bus/Human Body                                | £30 |
| MS How The Leopard Got its Spots                              | £31 |
| MS Gahan Wilson's Ultimate Haunted House                      | £31 |
| MS The Ultimate Frank Lloyd Wright for Windows                | £31 |
| MS Isaac Asimovs The Ultimate Robot for Windows               | £31 |
| MS Composers Collection for Windows                           | £49 |
| <i>(Contains 3 CD-ROMs, Mozart, Beethoven &amp; Schubert)</i> |     |
| MS Fine Artist  | £31 |

|                                     |      |
|-------------------------------------|------|
| Incredible Cross Section Storyway   | £29  |
| Eye Witness Encyclopedia of Science | £49  |
| The Way Things Work                 | £46  |
| Ultimate Human Body                 | £46  |
| My First Amazing Dictionary         | £29  |
| Animals (San Diego Zoo)             | £23  |
| World Atlas V5 MPC                  | £29  |
| Guinness Book of Records 1994       | £33  |
| Kodak Photo CD Access               | £15  |
| Macmillan's Childrens Dictionary    | £20  |
| Oxford English Dictionary V2        | £389 |
| Concise Oxford Dictionary           | £32  |
| Oxford Business Shelf               | £26  |
| Oxford Compendium on CD-ROM         | £51  |
| Oxford Dictionary of Quotations     | £32  |
| Oxford Language Shelf               | £26  |
| Oxford Reference Shelf on CD-ROM    | £51  |
| Oxford Science Shelf                | £26  |
| Oxford Study Shelf                  | £26  |
| Oxford Thesaurus                    | £32  |
| Oxford Writers Shelf                | £26  |
| <b>MINDSCAPE</b>                    |      |
| Beethoven's Fifth                   | £23  |
| Oceans Below                        | £15  |



## Fonts AND CLIP ART

|                                 |     |
|---------------------------------|-----|
| Adobe Type Manager V3           | £49 |
| Corel Gallery on CD             | £27 |
| Corel Photo Libraries           | £21 |
| Lotus Smartpics                 | £89 |
| Publisher StyleLine Design Pack | £25 |
| MS True Type Fonts Pack 2       | £42 |
| MS True Type HP Fonts Pack      | £42 |
| Word Perfect Clip Art Home      | £21 |
| Word Perfect Clip Art Office    | £21 |



## FORMS AND CHARTS

|                   |     |
|-------------------|-----|
| Labels Unlimited  | £29 |
| Family Tree Maker | £35 |
| Form Tool Gold    | £43 |



## GRAPHICS

|  |      |
|--|------|
| <b>DESIGN</b>                              |      |
| Adobe Illustrator                          | £389 |
| Adobe Type Manager WP                      | £46  |
| Corel Draw 3.0                             | £62  |
| Corel Draw 4.0 on 3.5" & CD                | £109 |
| Corel Draw 4 on CD                         | £99  |
| Corel Draw 5.0 on 3.5" & CD ROM            | £389 |
| Corel Draw 5.0 CD ROM Only                 | £289 |
| Corel Draw 3.0 to 5.0 Upgrade on CD        | £199 |
| Corel Draw 3.0 to 5.0 Upgrade on 3.5" & CD | £270 |
| Corel Draw 4.0 to 5.0 Upgrade on CD        | £118 |
| Corel Draw 4.0 to 5.0 Upgrade on 3.5" & CD | £145 |



|   |     |
|---|-----|
| Visio V3  | £88 |
| Visio Upgrade                                   | £59 |
| Visio Express for Office                        | £59 |
| Visio Express for Smartsuite                    | £59 |
| Visio Stencil - Advanced Flowcharts             | £39 |
| Visio Stencil - Advanced Network Diagrams       | £39 |
| Visio Stencil - Software Diagrams               | £39 |
| Visio Stencil - Marketing                       | £39 |
| Visio Stencil - Advanced Electrical Engineering | £39 |
| Visio Stencil - Advanced Space Planning         | £39 |
| Visio Stencil - Chemistry                       | £39 |
| Visio Stencil - Chemical Engineering            | £39 |
| Visio Stencil - Biotechnology / Medicine        | £39 |
| Visio Stencil - Mechanical Engineering          | £39 |
| Visio Stencil - Petroleum Engineering           | £39 |
| Visio Stencil - Home Planning                   | £39 |
| Visio Stencil - Landscape Planning              | £39 |

|  |      |
|--|------|
| <b>PRESENTATIONS</b>                     |      |
| Asound V2                                | £135 |
| Asound V2 Competitive Upgrade            | £79  |
| Autodesk Animator Pro                    | £349 |
| Asymedia Interactive Media Presentation  | £85  |
| Asymedia Mediablitz                      | £49  |
| Asymedia Toolkit                         | £110 |
| Harvard Graphics V3                      | £179 |
| Harvard Graphics Competitive Upgrade     | £135 |
| Lotus Freelance V2.0                     | £258 |
| Lotus Freelance V2.0 Competitive Upgrade | £135 |
| Lotus Freelance V2.01                    | £95  |
| MS Powerpoint V4.0                       | £224 |
| MS Powerpoint V4.0 Upgrade               | £84  |
| MS Powerpoint V4.0 Competitive Upgrade   | £115 |



## IMAGES & IMAGE EDITING

|  |      |
|--|------|
| Adobe Photoshop V3                         | £449 |
| Adobe Premier Software                     | £180 |
| Corel Artshow V4.0                         | £119 |
| Corel Photo CD (over 100 titles available) | £19  |



## KIDS

|  |     |
|--|-----|
| Fun School 3 for under 5's             | £15 |
| Fun School 3 for 5-7's                 | £15 |
| Fun School 3 for 7-11's                | £15 |
| Fun School 4 for 5's                   | £15 |
| Fun School 4 for 5-7's                 | £15 |
| Fun School 4 for 7-11's                | £15 |
| Fun School in Time 8-11 on 3.5" or CD  | £19 |
| Fun School Dreamland 4-7 on 3.5" or CD | £19 |
| Fun School in Space on 3.5" or CD      | £23 |
| MS Beacon for Kids on 3.5" or CD       | £26 |
| MS Creative Writer                     | £26 |
| MS Fine Artist                         | £26 |

## BUDGET SOFTWARE

|  |     |
|--|-----|
| Cosmi Just Lotto   | £15 |
| <i>(Aim to beat the National Lottery - It Could Be You)</i>    |     |
| Cosmi Just Pools (If you can't beat the lottery win the pools) | £15 |
| Cosmi Kazanhen's Flying Circus                                 | £15 |
| Cosmi Garden Architect   | £11 |
| Cosmi SwiftDraw  | £15 |
| Cosmi Calendar Magic   | £11 |
| Cosmi Windows Arcade Solid Gold                                | £15 |
| Cosmi Desktop Publisher for Windows                            | £11 |
| Cosmi Fun Fonts & Dingbats                                     | £11 |
| Cosmi 3D Virtual Reality Room Planner                          | £11 |
| Cosmi CHAOS! Screensaver                                       | £7  |
| Cosmi Windows on the World - Atlas                             | £11 |
| Cosmi Forms Maker for Windows                                  | £15 |
| GST Wine Cellar  | £16 |
| GST Video Library  | £16 |
| GST Business Expenses  | £25 |
| GST Instant Receipts   | £16 |
| GST Motoring Expenses  | £16 |
| GST Purchasing Manager   | £25 |



## CAD

|                                    |      |
|------------------------------------|------|
| Autocad LT                         | £355 |
| Autosketch V2                      | £139 |
| Autosketch V3                      | £60  |
| Autodesk Home Designer             | £35  |
| Autodesk Kitchen Designer          | £35  |
| Autodesk Landscape Designer        | £35  |
| Generic Cad V6.1                   | £359 |
| Key Cad Complete Win on 3.5"       | £29  |
| Planix for Windows (Office Design) | £88  |
| TurboCAD V2.0 Windows              | £55  |
| TurboCAD Professional Win          | £155 |
| FastCad FloorPlan Plus 3D          | £129 |
| FastCad 3D Design Plus 2.0         | £88  |
| FastCad Estimator Plus             | £44  |



## COMMUNICATIONS

|  |        |
|--|--------|
| Carbon Copy V2                             | £74    |
| Carbon Copy Plus V6.1                      | £74    |
| Compuserve Information Manager             | £19    |
| Delrina Wincomm Pro                        | £65    |
| Lotus Notes Starter Pack Windows V3.2      | £599   |
| Lotus Notes Starter Pack OS/2              | £1,239 |
| Lotus Notes Starter Pack NLM V3.1 for 3.5" | £1,239 |
| Lotus Notes Starter Pack NLM V3.1 for CD   | £599   |
| Lotus NotesSuite Starter Pack for CD       | £749   |
| Lotus Notes Client                         | £325   |
| Lotus Notes Express                        | £125   |
| Norton PC Anywhere for Win V2              | £98    |
| Norton PC Anywhere for DOS Host & Remote   | £89    |
| Norton PC Anywhere V5 for DOS Host         | £55    |
| Norton PC Anywhere for DOS Remote          | £64    |
| Reachout - Modern Host & View              | £85    |
| Reachout - Modern Host Only                | £65    |
| Reachout - Modern View Only                | £55    |
| Reachout - Network 4 User                  | £129   |
| Procomm Plus V2.1 DOS                      | £54    |
| Procomm Plus V2.1 Win                      | £99    |
| <b>FAX</b>                                 |        |
| Delrina Winfax Pro V4.0                    | £52    |
| Delrina Winfax Pro Upgrade                 | £33    |
| Delrina Winfax LAN Starter Kit             | £182   |
| Wordperfect ExpressFax Plus                | £34    |
| Network Superfax 5.1 UK 5 Users            | £199   |
| Network Superfax 5.1 UK Unlimited Users    | £379   |



## GAMES AND ENTERTAINMENT ON CD

|   |     |
|---|-----|
| Adult Cover Girl Strip Poker (cert 18)                            | £21 |
| Adult The Lovers Guide  | £27 |
| Adult Digital Love  | £19 |
| Adult The Joys of Sex   | £29 |
| Adult The Essential Guide to Better Sex                           | £20 |
| American S/W Software Walk Thru & Fly By (Includes book and disk) | £21 |
| CDJ America's 101 Greatest Hit                                    | £14 |
| BMG Lookstar  | £35 |
| Codemasters Psycho Pinball  | £27 |
| EA Broderbund "Arthur's Teacher Trouble"                          | £25 |
| EA Broderbund "Grandma and Me"                                    | £23 |
| EA Labyrinth  | £25 |
| EA Strike Commander   | £29 |
| EA Myst   | £29 |
| EA Ultima VIII  | £34 |
| EA Theme Park   | £29 |
| EA PGA Tour Golf  | £29 |
| Gametek Bureau 13   | £25 |
| Gametek Elite 2   | £25 |
| Gametek First Encounters  | £25 |
| Gametek Humans (V1)   | £27 |
| Gametek The Journeyman Project Turbo                              | £25 |
| Harpoon Classics  | £25 |
| Interplay Lord of the Rings                                       | £25 |
| Interplay Dungeon Masters 2                                       | £25 |
| Interplay Star Trek 25th Anniversary CD                           | £29 |
| Interplay Sim City CD   | £29 |
| Interplay Ten Year CD Compilation                                 | £26 |
| Legend of Kyrandia/Hook Bundle                                    | £15 |
| Loom  | £14 |
| Loderunner  | £29 |
| Microprose Dragonsphere   | £22 |
| Microprose Iron Helix   | £25 |
| Microprose Subwar 2050  | £29 |
| Microprose UFO  | £29 |
| Mindscape Mario is Missing  | £29 |
| Mindscape Dracula Unleashed                                       | £29 |
| Mindscape Mega Race   | £24 |
| Mindscape Sherlock Holmes 2                                       | £25 |
| Mindscape Sherlock Holmes 3                                       | £25 |
| Mindscape Commander Blood   | £29 |
| Monty Pythons Complete Waste of Time                              | £35 |
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| Claris Works   | £59    |
| Lotus SmartSuite V3.0 CD                                 | £369   |
| Lotus SmartSuite V3.0 CD Upgrade                         | £199   |
| Lotus SmartSuite V3.1                                    | £315   |
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| Lotus SmartSuite V3.1 Upgrade                            | £169   |
| Lotus Works V3.0 for DOS                                 | £80    |
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| MS Works V3.0 Upgrade                                    | £82    |
| MS Works V3.0 Windows (Now includes FREE MS Money)       | £82    |
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| Novell PerfectOffice V3 Professional Competitive Upgrade | P.O.A. |
| Novell PerfectOffice Professional Upgrade                | P.O.A. |
| Novell PerfectOffice Standard                            | £179   |
| Novell PerfectOffice Standard Competitive Upgrade        | £155   |
| Novell PerfectOffice Standard Upgrade                    | £133   |
| Wordperfect Works WIN                                    | £50    |

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| Novell Personal Network 5 User   | £184   |
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| Sage Mainline Software Only      | £49    |

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| Textbridge                      | £69  |
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| Character Eyes 2.5 Professional | £169 |

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| IBM OS/2 Warp V3 3.5 Upgrade Kit | £40  |
| IBM OS/2 Warp V3 CD Upgrade Kit  | £27  |
| MS DOS 6.22 Upgrade              | £36  |
| MS Windows NT Server V3.5 CD     | £485 |
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| Cordl SCSI   | £65  |
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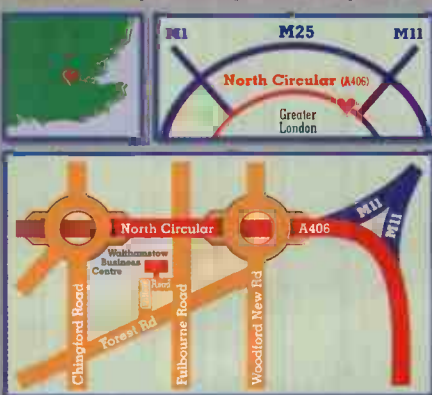
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| Accent Express   | £35  |
| Accent Express Special Edition                                   | £95  |
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### Office Graduate

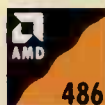
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- 2 Serial, 1 parallel ports
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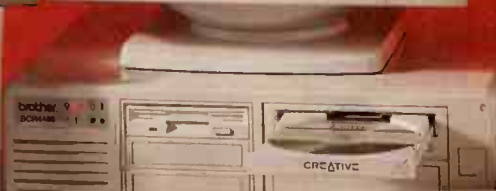
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MULTIMEDIA ENCYCLOPEDIA



Boxes shown for illustration only

EnergyStar  
compliant with  
advanced Power  
Saving Facilities

- 486DX2 66MHz Processor
- 420Mb Hard Disk
- 128K Cache
- 8Mb RAM exp. to 128Mb
- 14" SVGA Low Radiation MPRII, Non-interlaced Colour Monitor (0.28 dp), EPA EnergyStar
- 1Mb VESA Local Bus Graphics Accelerator
- 3.5" 1.44Mb Floppy Disk
- 2 VESA Local Bus slots
- 2 serial, 1 Parallel Ports
- 1 x 8-bit, 6 x 16-bit (2VL) slots
- Dual speed CD-ROM
- SoundBlaster 16-bit Stereo Soundcard
- Games Pro Joystick
- Deluxe Stereo Speakers
- PC GemFax Internal Fax/Modem with communications software
- Microsoft compatible mouse
- 102 key enhanced Keyboard
- The MAX Software Package (see panel for details)
- Windows for Workgroups 3.11 and MS-DOS 6.2
- Desktop Case
- 12 months on-site warranty

Amazing power. Fantastic features. And a stunning array of software. The Brother MAX gives you everything you need to enjoy the multimedia experience - and much, much more besides.

The MAX is designed for uncompromising performance - 486DX2 66MHz processor, 8Mb of RAM, large 420Mb storage, a double-speed CD-ROM, 16-bit stereo soundcard and high-speed VESA local bus graphics.

When it comes to getting the most from your system the MAX is exceptional - all your Business, Education, Entertainment and Communications needs are catered for - we even include a modem and software to get you into the exciting world of the information superhighway

The MAX is a system you deserve. Built with attention to detail, quality engineered and designed to keep you up and running, year after year.

AMAZING  
VALUE

£1249

Add £130 to upgrade to Modem with Voice Facility

### The Max Software Package:

#### Business: Lotus Smartsuite v3 inc:

- Lotus 123 v5 Spreadsheet
- Lotus AmiPro 3.1 Word Processor
- Lotus Approach 3.0 Database
- Lotus Freelance Graphics Presentation
- Lotus Organizer 1.1

#### Entertainment: (Top 10 Games)

- Dragon Lore
- MegaRace
- Theme Park
- FIFA International Football

#### Education:

- Grolier's MultiMedia Encyclopaedia
- MultiMedia Typing Tutor

#### Communications:

- Connection to Compuserve and Internet (Free for Limited period)
- Supervoiced (requires Modem with Voice available for extra £130)

#### Utilities:

- Pilot MultiMedia Graphical Interface
- Training for Lotus Smartsuite
- Interlude and Get Organised
- Professor MultiMedia
- Professor Windows

(On-line documentation included)

To the best of our knowledge the specifications and prices shown are correct at the time of press. Subject to change without notice. E & O.E.

ALL PRICES EXCLUDE VAT



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mouse pre-  
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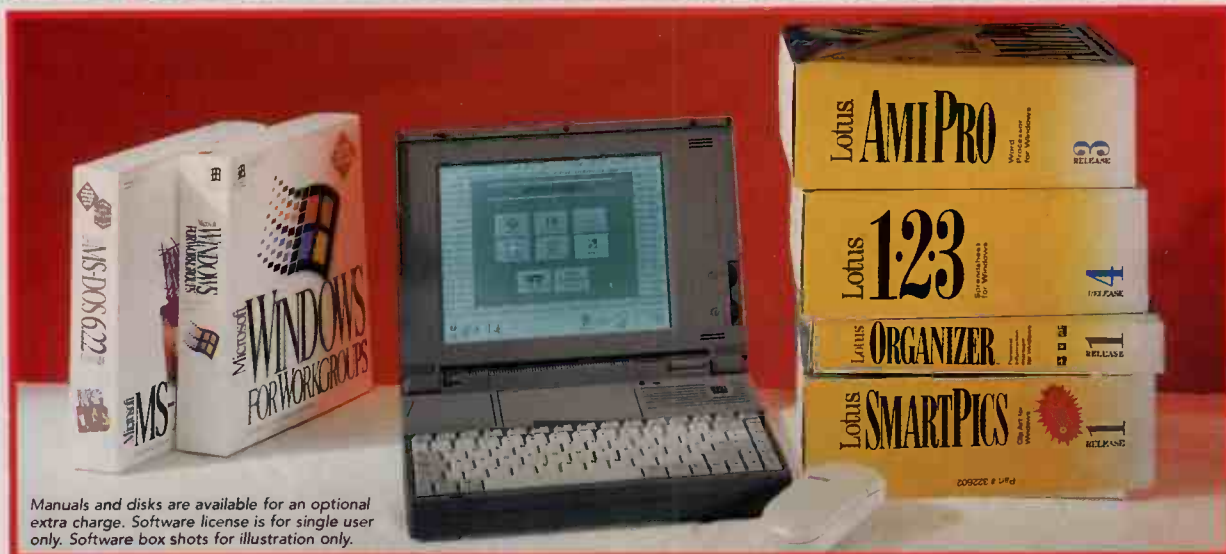
Visit our Showroom  
Mon-Fri 9am-5pm  
Sat 10am-4pm

DELIVERY: Add £20+VAT per system  
for delivery in UK Mainland. Delivery  
will normally be effected on the next  
working day. Please allow 5 days for  
cheque clearance. Carriage will be  
charged for items returned within the  
30 day guarantee period

ALL PRICES EXCLUDE VAT

**Kyodai**  
A BROTHER COMPANY

## The Brother & Lotus Notebook



Manuals and disks are available for an optional extra charge. Software license is for single user only. Software box shots for illustration only.

Brother brings you an exclusive notebook solution that represents truly amazing value. The powerful Brother BCP431V notebook with its fast 486DX 33MHz processor and large 250Mb hard disk, together with a complete suite of Lotus Windows software (now upgraded to include Lotus 123 v5) pre-installed and ready to run for your convenience. This solution provides the answer to all your needs - word processing, spreadsheet, personal organising plus clipart graphics - and all Lotus documentation is pre-loaded to provide on-line help as you need it.

### LOTUS SOFTWARE

All this software is Pre-installed and ready to run

- Lotus 123 v5
- Lotus Ami Pro 3.1
- Lotus Smart Pics
- Lotus Organizer 1.0
- Lotus ScreenCam

Disks and manuals extra.  
Does not include  
Microsoft Works



### Brother BCP431V

- 486DX 33MHz Processor
- Maths Co-processor
- Internal cache memory
- 250Mb Hard Disk
- 4Mb RAM expandable to 8Mb
- Power saving conservation feature on Hard Disk and LCD
- Easy to read back-lit 10" VGA Mono LCD with 64 greyscales
- 3.5" 1.44Mb floppy disk drive
- 2 x Serial, 1 x Parallel, SVGA monitor and keyboard ports
- 2-4 hours average charge time
- Password protection
- Microsoft compatible Mouse
- Lotus Software Bundle
- Windows for Workgroups 3.11, MS-DOS 6.2
- 292(w) x 217(d) x 46(h) mm
- Weighs only 3Kg
- 12 Month on-site warranty
- Wide range of options: carry case, car adaptor, trackerball, extra battery, LAN Ethernet D link, keyboard adaptor.

**£899**

## The Brother Litebook

No other Notebook is this  
lightweight, this powerful,  
this flexible or this affordable

**£699**

For ultimate portability without sacrificing usability or performance, the Brother LiteBook sub-notebook is what you've been waiting for. Never has so much computing power been packed into such a compact unit. PCMCIA slots give you access to optional plug-in cards that can provide fax/modem, extra memory and much more. The Sleep and Suspend feature extends usage time and the Nickel Metal Hydride battery provides up to 4 hours of power. To complete the package Microsoft Works v3.0 is pre-loaded to provide a complete suite of applications the moment you power up.

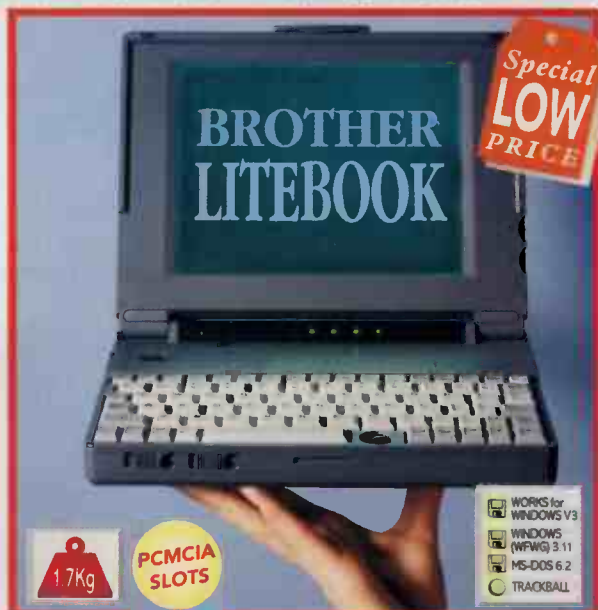
### The Brother Traveller



### The Brother Litebook with GemFax PCMCIA Fax/Modem and Communications Software

- PCMCIA card slots straight into Litebook
- Gain access to the InterNet and Information Superhighway with FREE subscription + £25 on-line time
- Free Communication Software (Windows & DOS)
- Group III Send and Receive Fax
- 2400 bits per second Modem
- Dataflex 5 Year Guarantee

**£799**



- 486SLC 25MHz processor
- Built-in co-processor
- 4Mb RAM exp. to 20Mb
- 80Mb Hard Disk
- PCMCIA slots: 2 x type II, 1 x type III
- External 3.5" 1.44Mb FDD
- 8.5" VGA LCD 64 Greyscales
- External colour (1024 x 768) port
- Ports: 1 serial, 1 parallel, 1 SVGA + External keyboard, 1 External Floppy Disk Drive
- Built-in Micro Trackball with left/right buttons
- Microsoft Works 3.0 package includes Word Processing, Spreadsheet, Database and Communications
- Microsoft Windows 3.11, MS-DOS 6.2
- Removable Long-Life NiHi battery
- 252mm x 192mm x 39mm
- Weight 1.7kg with battery
- 12 months on-site warranty



# New Brother Trekker Notebooks

**SUPERFAST**  
**50MHz**  
**PROCESSOR**

Trekker 486 Mono 250Mb

£799



Trekker 486 Colour 250Mb

£979

Brother Trekker Mono and Trekker Colour come standard with Trackball Module.

The Brother Trekker is the perfect business travelling partner. It is one of the world's smallest and most lightweight portable computers yet packs the power of the Superfast 486SLC2 50MHz processor and is equipped with a formidable array of features you would expect to find on your desktop PC. Giving you the power to run your applications while visiting customers on-site, while on the move or to bring work home.

Designed for flexibility, the Brother Trekker features Personality Modules - exchangeable cartridges enabling you to tailor the Trekker for your own use. The Trekker comes with a Trackball device as standard, optional modules include a Pocket Fax/Modem, Lan Ethernet Adaptor and a second RS232 port.

Weighing a mere 2.3Kg and approximately the size of an A4 sheet, the Brother Trekker combines the most advanced technology with superb portability enabling it to readily perform as your primary computer, as well as being your perfect portable companion.

Trekkers Now  
Standard with  
**250Mb**  
Hard Disk

## TREKKER SPECIFICATIONS

- 486SLC2 50MHz processor
- 4Mb RAM expandable to 8Mb
- 250Mb hard disk
- Built-in 3.5" 1.44Mb floppy disk drive
- Mono: 9.5" VGA LCD 64 greyscales
- Colour: 8.25" passive matrix colour LCD
- External colour (800 x 600) SVGA port
- Micro Trackball module with left/right buttons
- 80-key keyboard with embedded numeric keypad
- Suspend/Resume feature
- Ports: 1 serial, 1 parallel, 1 SVGA + external keyboard
- 2-4 hour fast charge NiCd battery
- Microsoft Works v3.0 integrated package includes Word Processing, Spreadsheet, Database, Communications
- Microsoft Windows for Workgroups 3.11, MS-DOS 6.2
- 279mm x 210mm x 40mm
- Weight 2.3kg
- 12 Months on-site warranty

## TREKKER OPTIONS

Brother Trekker with 250Mb Hard Disk and Lotus Bundle 1\*

(Lotus 123 v5,  
Lotus Ami Pro 3.1,  
Lotus Organiser 1.0,  
Lotus Smart Pics,  
Lotus ScreenCam)

Mono: **£808**  
Colour: **£1028**



Brother Trekker with 250Mb Hard Disk and Lotus SmartSuite 3.0\*

(Lotus 123 v5,  
Lotus Ami Pro 3.1,  
Lotus Organiser 1.0,  
Lotus Approach 3.0,  
Lotus Freelance Graphics)

Mono: **£868**  
Colour: **£1088**



|                    |      |                      |     |
|--------------------|------|----------------------|-----|
| Additional 4Mb RAM | £150 | Car Adaptor          | £49 |
| RS232 Module       | £13  | Executive Carry Case | £49 |

\* Includes on-line documentation. Disks and manuals available at extra cost. Does not include Microsoft Works. Boxes shown for illustration.

## Software worth over £200



- Microsoft® Works for Windows V3 integrated package inc. Word Processing, Spreadsheet, Database, Communications
- MS-DOS 6.2 • Microsoft Windows for Workgroups 3.11

Documentation and disks included. Software boxes shown for illustration only.

To the best of our knowledge the specifications and prices shown are correct at the time of press. Subject to change without notice. E & O.E.

ALL PRICES EXCLUDE VAT



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working day. Please allow 5 days for  
cheque clearance. Carriage will be  
charged for items returned within the  
30 day guarantee period

**ALL PRICES EXCLUDE VAT**

**Kyodal**  
A BROTHER COMPANY

## New Brother Pro'Book



PCMCIA Card Slots  
Type II and Type III



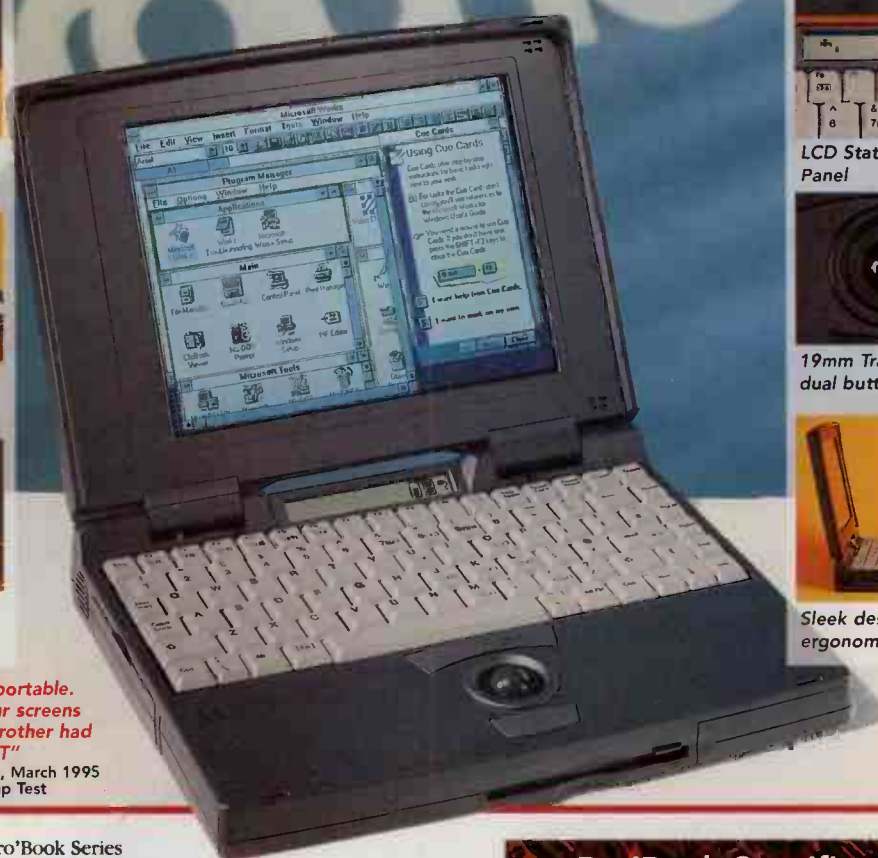
Removable long-life  
battery with 5-level  
charge indicator



Removable Hard Disk  
for Infinite Storage  
and Security

*"A well designed portable.  
Of all the 256 Colour screens  
reviewed here, the Brother had  
the nicest TFT"*

Personal Computer World, March 1995  
40 Notebook Group Test



LCD Status Indicator  
Panel



19mm Trackball with  
dual buttons



Sleek design and  
ergonomic palmrests

The New Brother Pro'Book Series represents the next generation in portable computing. Now you can have more power in your notebook than you have on your desktop. Choose from DX/33, DX/50 and the lightning-fast IntelDX4™ processor running at 75MHz or 100MHz.

Designed for the most sophisticated users the Pro'Books are equipped with quite simply the ultimate in features and facilities, while providing sleek aesthetics and comfortable usability.

Convenient upgradability has arrived with the modular design Pro'Book: the hard disk is removable allowing infinite storage and security; the LCD displays are exchangeable, providing an upgrade path from Mono to Dual Scan Colour or onto TFT Colour at a later date. And as the Pro'Book is designed to give easy access to the motherboard it allows simple upgrades of memory. The processor chip is even upgradable.

In addition the 3.3V technology design enhances the efficiency of the removable battery which features a 5-level remaining capacity display.

To enhance the Pro'Book, PCMCIA slots give access to versatile applications including Fax/Modem, networking, SCSI devices and hard disks.

Along with your Brother Pro'Book you get excellent support, 12 months on-site warranty and a 30-day money-back guarantee. Superb ergonomics, an extensive list of features, outstanding performance and superb pricing - the Pro'Book is the professionals choice.

### Pro'Book BCP600 Series

All prices are for  
standard 250Mb Hard Disk.

| Model   | Processor  | 9.5" Mono | 9.5" Dual Scan | 9.5" TFT Colour |
|---------|------------|-----------|----------------|-----------------|
| BCP 631 | 486DX-33   | £999      | £1299          | £1899           |
| BCP 641 | 486DX2-50  | £1079     | £1379          | £1979           |
| BCP 651 | 486DX4-75  | £1249     | £1549          | £2149           |
| BCP 661 | 486DX4-100 | £1299     | £1599          | £2199           |

### Pro'Book Options

|  |       |
|--|-------|
| Upgrade from 4Mb to 8Mb RAM                | £159  |
| Upgrade from 8Mb to 16Mb RAM               | £299  |
| Upgrade from 16Mb to 32Mb RAM              | £599  |
| Internal Battery Pack                      | £49   |
| Business Sound System                      | £49   |
| Docking Station                            | £399  |
| Additional NiMH Battery Pack               | £73   |
| Car Adaptor                                | £49   |
| Executive Carry Case                       | £49   |
| Extra Hard Disk Kits:<br>250Mb/340Mb/520Mb | £CALL |

Brother Pro'Book 486DX33 Mono/250Mb  
and Lotus Bundle 1\*

inc: Lotus 123 v5,  
Lotus Ami Pro 3.1,  
Lotus Organiser 1.0,  
Lotus SmartPics,  
Lotus ScreenCam

**£1019**

Brother Pro'Book 486DX33 Mono/250Mb  
Hard Disk and Lotus SmartSuite 3.0\* **£1079**

\*Disks and manuals extra. Does not include Microsoft Works.

### Pro'Book Specifications

- **Choice of Display:**  
Mono 9.5" VGA LCD 64 greyscales  
Dual Scan Colour 9.5"  
Colour Active Matrix TFT 9.5"
- **Choice of Processor:**  
486DX 33MHz, 486DX2 50MHz,  
486DX4 75MHz, 486DX4 100MHz
- 4Mb RAM exp. to 8Mb, 16Mb or 32Mb
- Removable 250Mb hard disk  
(340Mb/520Mb options)
- Built-in 3.5" 1.44Mb floppy disk drive
- 1Mb VESA Local Bus graphics accelerator
- PCMCIA slots: 2 x Type II and 1 x Type III
- Docking Station Connector
- Ergonomic Palmrests
- Full feature power management with doze,  
sleep, suspend and suspend to disk mode
- LCD Status Indicator
- Removable battery pack with 5 level  
LED display of remaining capacity
- External colour (1024 x 768) SVGA port
- 19mm Trackball module with dual buttons
- 84-key keyboard with embedded  
numeric keypad
- Ports: 1 serial, 1 enhanced bi-directional  
parallel, 1 SVGA + external keyboard
- 2 hour fast battery charge
- Microsoft Works v3.0 integrated package  
includes Word Processing, Spreadsheet,  
Database, Communications
- Microsoft Windows for Workgroups 3.11,  
MS-DOS 6.2
- 286mm x 220mm x 45mm
- Weight 2.6kg
- 12 Months on-site warranty

### PCMCIA Fax/Modems

With Delrina WinFax Lite Software

14,400bps **£129** 28,800bps **£199**



# New Brother Printers

All Brother Printers inc  
1 Year On-site Warranty

brother

**New**  
Brother HL-660  
Laser Printer  
Now Available



## The new HL-630 Superfast All-Rounder. Ordinary Windows-only printers don't look so clever now.

The amazing new HL-630 is a completely different kind of laser printer. It's the first superfast all-rounder on the market.

### SUPERFAST FOR WINDOWS™

It offers outstanding performance within Windows. Its GDI technology means first page out is virtually instant, and printing is continuous, with no pause between pages.

### SUPER-VERSATILE TOO

But unlike the cheap & cheerful GDI-only printers currently available, the HL-630 is also at home outside Windows, because Brother have put the technology into this new printer that others have left out of theirs. Conventional GDI printers rely directly on your PC and can't think for themselves. That means they're only as good as your existing hardware. What's more GDI printers only work effectively within Windows, so they are useless if you need to print directly from DOS or connect to a network. The HL-630 is completely different. It has PCL level 4 and multi-emulations, which mean it can print directly from DOS - and it's fully networkable too. So you get all the benefits of GDI without the limitations.

### OUTSTANDINGLY HIGH QUALITY

Print quality is excellent too, with possibly the lowest cost per copy on the market. And you only have to try the HL-630 once to realise that it's built like every other Brother laser, with no compromise on quality.

### OUTSTANDINGLY LOW PRICE

You'd expect a significant price premium for such a major advance in versatility and technology. But you'd be wrong - no laser printer has ever offered so much for so little. The new HL-630 superfast all-rounder. It makes competitors look less than clever

### BROTHER HL-630 Laser Printer

- Superfast first page out
- Six pages per minute
- GDI mode for windows
- Built-in emulations for DOS printing
- Low cost per copy
- Network connectivity
- Microfine toner
- Straight paper path
- Auto emulation switching
- Economy print mode

only **£349**

### BROTHER HL-660 Laser Printer

All the features of the HL-630 plus

- 600dpi resolution
- 2Mb RAM expandable to 8Mb
- HP LaserJet™ 4, Epson FX-850 and IBM Proprinter XL emulations

only **£499**

### Brother HJ-400 Low Cost InkJet Printer



- Optimised for Windows
- Apple Mac and PC compatible
- Built-in 100 sheet feeder
- 2ppm
- Small footprint

only **£169**

- Genuine 600dpi with 1200dpi achieved with high resolution control & photoscale technology
- True 12ppm print speed
- 2Mb memory upgradeable to 26Mb
- BR-Script level 2 (PostScript®) and PCL5e emulations
- Duplex and Network options available
- 75 Scalable Fonts
- 500 sheet paper cassette plus 150 sheet multi tray
- Microfine Toner
- PCMCIA card slot and Font cartridge slot

only **£949**

### The new HL-1260 Ultimate Workgroup Laser Printer



**New**

Full Range of Printers from Brother, Canon, Epson and Hewlett-Packard available

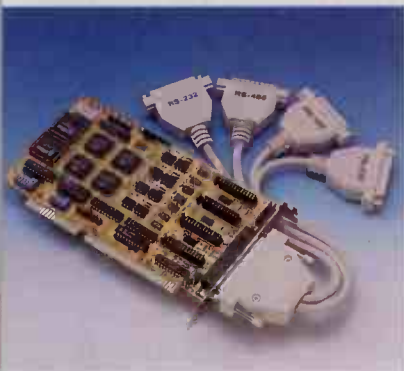
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# SEMAPHORE

## COMMUNICATIONS INTERFACES



### 4-Port RS232/RS422/RS485 Serial Card

High Quality AT Bus 4-Port Serial Communications Card. Shown above. Each port can be individually set for RS232, RS422 or RS485. Supplied with 16550 UARTs for baud rates to 115Kbps.

- ▼ Port address 100H - 3F8H
- ▼ Interrupts IRQ2-7, 10-12, 15
- ▼ LED indicators for transmit & receive
- ▼ Automatic data flow in RS485 mode
- ▼ Compatible with Arnet 4-Port Card
- ▼ Can be used for adding 4 ports to Windows and SCO Unix
- ▼ Supplied with 4-way cable set

£149

### Dual 16550 Serial Card + bi-directional Parallel

Ideal for hardware requiring high speed communications.

- ▼ Two 16550 serial ports COM1-COM4, IRQ2-5
- ▼ Bi-directional Parallel Port LPT1-LPT3, IRQ5,7
- ▼ Optional games port
- ▼ Enable/disable any port

£50

### Isolated Dual Port RS232/Current-Loop Card

Providing 2 Isolated RS-232 or current loop serial ports with baud rates up to 56Kbps.

- ▼ Supplied with 16550 UARTs
- ▼ Provides 500VDC isolation
- ▼ Port address 200H - 3F8H
- ▼ Interrupts IRQ2-7, 10-12, 15
- ▼ 16-Bit AT bus

£119

### Synchronous Serial Card

Single channel, multi-protocol communications adapter which uses an AMD 85C30-10 serial communications controller (SCC) as standard.

- ▼ RS232 interface
- ▼ Synchronous mode to 1.23M baud
- ▼ IRQ2-7, 10-12, 14-15
- ▼ DMA Channels 1 - 3

£220

Also Synchronous RS422/RS485 £220

### DigiBoard Serial Cards

The Best Engineered Multi-Channel Boards on the market today. The DigiCHANNEL PC/X is ideal for use in multi-user environments, most operating systems are supported with drivers available for DOS, XENIX, UNIX, OS/2, and many more.

|        |                    |      |
|--------|--------------------|------|
| PC/4   | 4-Port RS232 Card  | £295 |
| PC/8   | 8-Port RS232 Card  | £395 |
| PC/16  | 16-port RS232 Card | £750 |
| PC/4s  | 4-Port with 16550  | £325 |
| PC/8s  | 8-Port with 16550  | £450 |
| PC/16s | 16-Port with 16550 | £850 |

### DigiBoard PC/Xe Cards

The DigiCHANNEL PC/Xe range are intelligent multi-port RS232 high speed communication boards with on-board 80186 processor and 64K memory for increased throughput. Drivers available for DOS, Windows NT, Windows, OS/2, Xenix and UNIX.

|        |                          |      |
|--------|--------------------------|------|
| PC/2e  | 2-Port Intelligent Card  | £189 |
| PC/4e  | 4-Port Intelligent Card  | £395 |
| PC/8e  | 8-Port Intelligent Card  | £495 |
| PC/16e | 16-Port Intelligent Card | £795 |

### DigiBoard ISDN Card

Enables remote users to log in to a Novell File Server over a Digital Telephone Line (ISDN). Requires one card for the remote user and one card for the Server.

- ▼ Transfer rate 128Kbps
- ▼ Support for Novell Netware and Windows NT Remote Access Server
- ▼ Transparent connection
- ▼ BT Approved

£699

### AT bus Serial Card

Provides access to additional interrupts and any port address

- ▼ 2 RS232 serial ports
- ▼ 16 bit AT bus
- ▼ Interrupts IRQ2-7, 10-12, 14-15
- ▼ Selectable and shareable interrupt features

£75

Add £20 for 16550 option

### Dual RS422/RS485 Card

Offering 2 high speed serial ports for transmissions up to 4000 feet

- ▼ 2 RS422/RS485 serial ports
- ▼ Supplied with 16550 UARTs
- ▼ Up to 115K baud
- ▼ Port address 200H-3F8H
- ▼ IRQ2-7, 10-12, 15
- ▼ 16 bit AT bus

£89

Also Isolated RS422/RS485 Card £109

### Remote Data Acquisition Modules for RS485 Network

ADAM Modules (shown below) are compact intelligent sensor-to-computer interface units designed specifically for reliable operation in harsh environments. Their built-in microprocessors, encased in rugged Industrial grade plastic packages, let them independently provide intelligent signal conditioning, analog I/O, digital I/O, data display and RS485 Communication.



### Isolated RS232/RS485 Converter

ADAM modules need only 2 wires to communicate with their controlling host computer over a multidrop RS-485 network. ADAM modules also accept any power source between 10V and 30V and are protected against power reversal.

- ▼ Automatic control of data flow
- ▼ Input RS232 (4-wire)
- ▼ Output RS485 (2-wire)
- ▼ Baudrate 1.2K to 38.4K

£99

### Analog Input module

ADAM modules can accommodate multiple types and ranges of analog input. You select type and range remotely by issuing ASCII commands from your host computer.

- ▼ Input for thermocouple, mV, V, or mA
- ▼ Input range 15mV to 2.5V, 20mA
- ▼ 10 samples per second
- ▼ 1 digital input / event counter
- ▼ 2 digital outputs
- ▼ Baudrate 1.2K to 19.2K

£165

### ADAM Modules

|                                |      |
|--------------------------------|------|
| ADAM 8ch Analog Input Module   | £210 |
| ADAM 8ch Thermocouple Module   | £225 |
| ADAM Analog Output Module      | £165 |
| ADAM Digital I/O Module        | £119 |
| ADAM Relay Output Module       | £119 |
| ADAM Counter/Frequency Module  | £210 |
| ADAM IP66 Industrial Enclosure | £85  |
| ADAM Industrial PSU DIN-Rail   | £149 |

### PC-104 Modules

PC-104 Modules (shown below) allow easy development of PC-based controllers for embedded applications. The PC-104 modules simply stack together to produce compact modular PC-based systems without the need for backplanes or card cages. Many of the modules can also be added to our range of Industrial CPU Cards. Such systems are perfect for applications such as vending machines, laboratory instruments, telecomms, medical equipment and portable analyzers.

### PC-104 386SX CPU Module

The PC-104 386SX/33 CPU Module is a low power, high performance single board computer for embedded control applications.

- ▼ Very low power consumption
- ▼ CPU type AMD 386SX/SXL-33
- ▼ Watchdog timer
- ▼ Precision power monitoring
- ▼ Requires only single power supply +5V @ 540mA
- ▼ 512Kb Memory on-board

£229

Also with 1Mb £299, 2Mb £390, 4Mb £550

### PC-104 SVGA Display Module

The PC-104 Super VGA Module is a 16-bit hi-res display controller.

- ▼ 16-bit data bus
- ▼ Tseng Labs ET4000AX
- ▼ Requires single power supply +5V @ 580mA
- ▼ 1Mb DRAM for high-speed memory access

£169

### PC-104 Ethernet Module

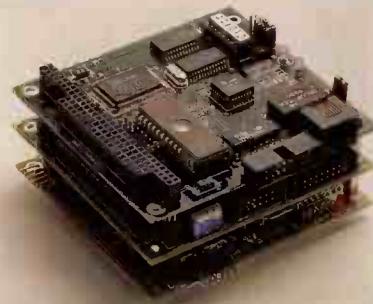
The PC-104 Ethernet Module is a 16-bit communication controller that complies with IEEE 802.3 CSMA/CD and is fully NE2000 compatible.

- ▼ Hardware and software compatible with Novell NE2000
- ▼ 10Mbps throughput
- ▼ Remote boot ROM socket
- ▼ Requires only single power supply +5V @ 400mA
- ▼ Base address 300H-360H
- ▼ IRQ2-7, 10-12

£109

### Embedded PC Modules

|                                  |      |
|----------------------------------|------|
| PC-104 Super I/O Module          | £99  |
| PC-104 RAM/ROM Disk Module       | £89  |
| PC-104 PCMCIA Memory Card Module | £250 |
| PC-104 RS232/RS422/RS485 Module  | £199 |
| PC-104 30KHz A/D Module          | £350 |
| PC-104 48ch Digital I/O Module   | £120 |





### Multifunction DAS Card

Versatile fully integrated low cost Multifunction AD/DA Digital I/O card.

- ▼ 12 bit 40KHz
- ▼ 16 single-ended or 8 differential A/D inputs
- ▼ 1 D/A output
- ▼ 16 digital inputs
- ▼ 16 digital outputs
- ▼ Pacer Clock
- ▼ Timer/Counter
- ▼ DMA and Interrupt
- ▼ Wiring Terminal Board

**£199**

### High Performance DAS Card

The complete and cost-effective solution for your PC based automation needs.

- ▼ 12 bit 100KHz
- ▼ 16 single-ended or 8 differential A/D inputs
- ▼ Built in 1K word FIFO
- ▼ Amplifier x0.5 to x1000
- ▼ 1 D/A Output
- ▼ 16 digital inputs
- ▼ 16 digital outputs
- ▼ Timer/counter
- ▼ Pacer Clock
- ▼ DMA and Interrupt
- ▼ Wiring Terminal Board

**£375**

### Digital I/O and Counter Card

The simple solution for providing digital I/O and timer functions

- ▼ 32 digital inputs TTL
- ▼ 32 digital outputs TTL
- ▼ 3 channel programmable counter/timer
- ▼ User configurable clock source
- ▼ Breadboard area

**£89**

### 144 bit Digital I/O Card

High Density mixed digital I/O Card for industrial monitoring & control.

- ▼ 144 Digital I/O lines
- ▼ Buffered circuits for higher driving capacity than the 8255
- ▼ Interrupt handling
- ▼ Output status readback

**£155**

### Industrial I/O Cards

|                             |      |
|-----------------------------|------|
| D/A Output Card 2ch.        | £155 |
| D/A Output Card 6ch.        | £285 |
| D/A Output Card 12ch.       | £399 |
| 24 bit Digital I/O Card     | £60  |
| 48 bit Digital I/O Card     | £80  |
| IEEE-488 Interface Card     | £199 |
| 4 1/2 Digit Voltmeter Card  | £295 |
| Stepping Motor Control Card | £255 |

### Industrial Workstation with 14" Colour CRT

Rugged heavy duty workstation for 19" rack or panel mounting.

- ▼ Highly integrated PC Workstation
- ▼ 1024 x 768 Colour CRT Monitor
- ▼ 27-key membrane keypad
- ▼ IP56/IP52 sealed hardened front panel
- ▼ Heavy duty aluminium and steel chassis
- ▼ 250-watt power supply
- ▼ 8 ISA slots
- ▼ 19"W x 14"D x 16.2"H

**£1600**

### Industrial Workstation with 9.4" LCD Display

Rugged heavy duty workstation with flat-panel LCD display and 80-key membrane keypad.

- ▼ Highly integrated PC Workstation
- ▼ 640 x 480 colour TFT display
- ▼ 19" rack/panel mount
- ▼ IP56/IP52 front panel
- ▼ 200-watt power supply
- ▼ 8 ISA slots
- ▼ 19"W x 10.5"D

**£3400**

Also with B/W LCD display

£1400

Also with EL display

£2550

### Relay Actuator and Isolated Digital Input Card

Offering 8 programmable electro-mechanical relays for ON/OFF control or small power switching, and 8 opto-isolated inputs which can be used as digital input under noisy environment or floating potential.

- ▼ 8 on-board SPDT relays
- ▼ LED indicators to show activated relays
- ▼ 8 opto-isolated digital input channels
- ▼ Easy to use and program

**£129**

### Wiring Kit & Relay Boards

|                                   |      |
|-----------------------------------|------|
| Wiring Terminal Board             | £35  |
| Industrial Wiring Kit             | £30  |
| Isolated Digital input board 16ch | £99  |
| Isolated Digital input board 24ch | £109 |
| Relay Board 16ch, 120V 1A         | £115 |
| Relay Board 24ch, 120V 1A         | £135 |
| Relay Board 16ch, 250V 5A         | £130 |
| Relay Board 24ch, 250V 5A         | £165 |
| SSR Module Carrier Board 8ch      | £70  |
| SSR Module Carrier Board 16ch     | £80  |
| SSR Module 280V AC 3A             | £9   |
| SSR Module 60V DC 3A              | £9   |

### Industrial 19" Chassis

The rugged all steel chassis conforms to the 19" rack mounting standard. The unit includes a 14 slot passive backplane and a high efficiency switching power supply (250W) in a dual-fan cooled chassis.

- ▼ Supports 286/386/486 CPU Cards, Optional PCI bus for Pentium
- ▼ Mounting for up to 4 drives
- ▼ Hold down clamp to protect plug in cards from vibration
- ▼ Positive air pressure inside generated by dual (push-pull) cooling fans
- ▼ Removable air filters

**£550**

### Flash/RAM/ROM Disk Card

Half-size disk card which can use up to 3Mb of SRAM, EPROM or Flash memory chips to replace a floppy disk drive. It offers faster access times and better protection from vibration, vapors and contaminants than physical drives.

- ▼ Emulates drive A,B,C or D
- ▼ Boots when emulating drive A
- ▼ Accepts 128Kx8 or 512Kx8 EPROMs, Flash Memory or SRAM.
- ▼ Simple installation
- ▼ No software required

**£110**



### Industrial CPU Cards

Industrial Grade CPU Cards designed to be highly reliable in harsh industrial environments. Built to ensure high end stability under extremes of temperature, shock and vibration. Special features include watchdog timers, RAM/ROM disk, PC-104 interface, floppy/IDE interface, bi-directional EPP/ECP parallel port and high speed RS232/RS485 serial ports.

|                                |       |
|--------------------------------|-------|
| Half-size Cards                |       |
| CPU Card 286/16                | £190  |
| CPU Card 386SX/25              | £240  |
| CPU Card 486SX/250             | £375  |
| CPU Card 486DX/266             | £455  |
| Full-size Cards                |       |
| CPU Card 486SX/250 256K cache  | £410  |
| CPU Card 486DX/266 256K cache  | £490  |
| CPU Card 486DX/4100 256K cache | £590  |
| CPU Card Pentium/66 256K cache | £1400 |

### Passive Backplanes

|                           |      |
|---------------------------|------|
| Passive Backplane 3 slot  | £30  |
| Passive Backplane 6 slot  | £45  |
| Passive Backplane 8 slot  | £50  |
| Passive Backplane 12 slot | £60  |
| Passive Backplane 14 slot | £70  |
| Passive Backplane 20 slot | £130 |

### Display and Keyboards

|                                |      |
|--------------------------------|------|
| 14" SVGA Colour Monitor        | £250 |
| Rack Mount Kit for 14" Monitor | £250 |
| SVGA Piggyback for CPU Cards   | £149 |
| SVGA Display Card 1Mb          | £80  |
| Rack Mounted Compact Keyboard  | £199 |
| Compact keyboard               | £60  |
| Standard Keyboard              | £40  |

### Disk Drives & Memory

|                             |          |
|-----------------------------|----------|
| Chassis with 420Mb drive    | add £160 |
| Chassis with 540Mb drive    | add £175 |
| Chassis with 1.44Mb floppy  | add £40  |
| Chassis with 1.2Mb floppy   | add £40  |
| CPU Card with 1Mb on-board  | add £50  |
| CPU Card with 4Mb on-board  | add £140 |
| CPU card with 8Mb on-board  | add £280 |
| CPU Card with 16Mb on-board | add £480 |



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# SEMAPHORE



# RICH NIGHT

SERVICING THE COMPUTER MEMORY INDUSTRY SINCE 1987

## DESKTOP MEMORY

| AST                                       | 2Mb | 4Mb | 8Mb | 16M  | 32M |
|---|-----|-----|-----|------|-----|
| ADV. 386SX/20; 386SX/25; Pro 386SX/25     | 54  | 210 |     |      |     |
| ADV. 486/25; 486/33; 486/33p; 486SX/20;   | 57  | 300 |     |      |     |
| Bravo 4/33 (Original); 486/25; Premium-   |     |     |     |      |     |
| 486/25; 486/25E; 486/33; 486/33E;         |     |     |     |      |     |
| 386/33TE; 486/25TE; 486/33TE; Premium-    |     |     |     |      |     |
| II 386/25; 386/33; 486/33; 486SX/20;      |     |     |     |      |     |
| Power Premium 3/33; 4/33; 4/33s; 4/50d;   |     |     |     |      |     |
| 4/66d; Premium Server SE 4/33             |     |     |     |      |     |
| Advantage Pro 486DX/33; 486SX/25;         |     | 105 | 210 | 440  | 880 |
| Bravo 4/25s; 4/33; 4/33s; 4/50d; 4/66d;   |     |     |     |      |     |
| Bravo LC 4/25s; 4/33; 4/33s; 4/50d;       |     |     |     |      |     |
| 4/66d; Bravo LP 4/25s; 4/33; 4/66d;       |     |     |     |      |     |
| Bravo MT 4/33; 4/66d                      |     |     |     |      |     |
| ADV. 486DX/33; 486DX2-50; 486DX2-66       |     | 110 | 210 |      |     |
| Bravo 286's; 386sx/16; 386sx/20; 386sx/25 | 70  | 210 |     |      |     |
| Bravo 3/25s; 3/33s                        | 54  | 210 |     |      |     |
| Premila 4/33; 4/33s; 4/50d; 4/66d         |     | 140 | 230 | 440  | 880 |
| Premium 386; Premium 386C                 |     | 140 |     |      |     |
| Premium 386/25; 386/33; 386SX/16;         |     | 140 |     |      |     |
| 386/33T; Premium II 386SX/20;             |     |     |     |      |     |
| 386SX/25; Premium Server SE 4/50;         |     |     |     |      |     |
| SE 4/66; Cupid Expansion Board            |     |     |     |      |     |
| Manhattan SMP                             |     |     |     | Call |     |

| COMPAQ                                       | 2Mb | 4Mb | 8Mb | 16M | 32M |
|--|-----|-----|-----|-----|-----|
| Deskpro 286N; 386N; 386s/20; 386s/20M;       | 70  | 115 | 220 | 440 | 880 |
| 3/25i; 3/33i; 4/25iS; 4/33i; 4/66i; 386/25M; |     |     |     |     |     |
| 386/33M; 486/33M; 486s/16M; 486s/25M;        |     |     |     |     |     |
| 486DX2/50M; 486DX2/66M; Deskpro XE-          |     |     |     |     |     |
| 433s; 450; 466; Enhanced Prolinea;           |     |     |     |     |     |
| Prolinea 4/25s; 4/33; 4/50; 4/66; 4/33s;     |     |     |     |     |     |
| CDS; Net 1/25s; 1/25s; 1/25T; Prolinea-      |     |     |     |     |     |
| MT 4/33s; MT 4/50; MT 4/66; Prosignia-       |     |     |     |     |     |
| 400/600/800 Series; Prosignia PC-            |     |     |     |     |     |
| Server 486/33; 486DX/2/66; Prosignia VS;     |     |     |     |     |     |
| Systempro/LT 386/25; 386/33; 486SX/25;       |     |     |     |     |     |
| 486/33; 486DX2/50; ProLiant 1000-            |     |     |     |     |     |
| 486DX2/66                                    |     |     |     |     |     |
| Deskpro 386/33; 486/25; 386/33L;             | 80  |     | 320 |     | 975 |
| 486/33L; 486/50L; Systempro 386/33;          |     |     |     |     |     |
| 486/33; 486/33-1020e; 486/33-1e; 486/33-     |     |     |     |     |     |
| 2040e; 486/33-680e                           |     |     |     |     |     |
| Deskpro 5/60M; 5/66M; XE 560;                |     |     | 280 | 460 | 880 |
| ProLiant 1000 5/60; ProLiant 2000-           |     |     |     |     |     |
| 486/50; 5/66; ProLiant 4000 486/50; 5/66;    |     |     |     |     |     |
| Prosignia PC Server 5/60                     |     |     |     |     |     |
| Prolinea 3/25s; 3/25s                        | 54  |     | 210 |     |     |
| Systempro /XL 486/50; Pentium                |     |     |     | 460 | 880 |

| DESKPRO 386/16                   | 1Mb | 1-2  | 4-8 | 8Mb |
|----------------------------------|-----|------|-----|-----|
|                                  | 67  | 160  | 314 | 470 |
|                                  | 4Mb | Mod. | 4Mb | 8Mb |
| Deskpro 386s                     |     |      | 154 | 207 |
| Deskpro 386/20; 386/20e; 386/25; |     |      | 154 | 187 |
| 386/25e                          |     |      |     |     |

| DELL                                  | 2Mb | 4Mb | 8Mb | 16M | 32M |
|---------------------------------------|-----|-----|-----|-----|-----|
| System 316SX; 320SX (Rev. 1); 325SX   | 70  |     |     |     |     |
| System 320SX (Rev. 2); 325D; 325P;    |     | 115 |     |     |     |
| 333D; 333P; 433P                      |     |     |     |     |     |
| Power Desktop 486D/16; 486D/20;       |     |     | 115 |     | 440 |
| 486D/25; 486D/33; 486D/50; 486D/66;   |     |     |     |     |     |
| Low Profile Desktop 486P/16; 486P/20; |     |     |     |     |     |
| 486P/25; 486P/33; Low Profile Power-  |     |     |     |     |     |
| Desktop 486P/50; 486P/66; Precision-  |     |     |     |     |     |
| 486 Series                            |     |     |     |     |     |
| Performance 425s/L; 425s/M; 433A/L;   |     | 115 |     | 440 |     |
| 433/M; 433T; 433s/L; 433s/M; 450/L;   |     |     |     |     |     |
| 450/M; 450T; 466/L; 466/M; 466T       |     |     |     |     |     |
| Performance 425s/ME; 433/ME; 433s/ME; |     |     | 230 |     | 880 |
| 450/ME; 466/ME; 400/XE Series 486/33; |     |     |     |     |     |
| 486/50; 486/66                        |     |     |     |     |     |
| System 425TE; 433TE; PowerLine-       | 80  | 140 | 230 | 440 | 880 |
| Workstations 420DE; 425DE; 433DE;     |     |     |     |     |     |
| 450DE; 450DE/2; 466DE; 420SE; 425SE;  |     |     |     |     |     |
| 433SE; 450SE; 450SE/2; 466SE          |     |     |     |     |     |

| HEWLETT PACKARD                       | 2Mb | 4Mb | 8Mb | 16M | 32M |
|---------------------------------------|-----|-----|-----|-----|-----|
| Vectra DS/16SS; DS/20; RS/20; RS/20C; | 70  | 140 |     |     |     |
| RS/25; RS/25C                         |     |     |     |     |     |
| Vectra 386/25 PC; 486/25VL; 486/33VL; | 70  | 115 | 220 | 440 | 880 |
| 486/66VL; 486/25N; 486/33N; 486/50N;  |     |     |     |     |     |
| 486/66N; 486/25M; 486/25M; 486/25N;   |     |     |     |     |     |
| 486/33M; 486/33M; 486/33M; 486/33M;   |     |     |     |     |     |
| 486/33M; 486/33N; 486 PC; 486s/20;    |     |     |     |     |     |
| 486/25T; 486/33T PC; 486/25U PC;      |     |     |     |     |     |
| 486/33U PC; 486/50U PC; 486/66U PC;   |     |     |     |     |     |
| 486/33ST; 486/66ST; 486/33XM;         |     |     |     |     |     |
| 486/50XM; 486/66XM; 486/33XM;         |     |     |     |     |     |
| NetServer LE Series 486DX/33;         |     |     |     |     |     |
| 486DX2/66; 486SX/33; NetServer LM-    |     |     |     |     |     |
| Series 4/33 LM; 4d/66 LM; 5/60 LM     |     |     |     |     |     |
| Vectra 386/16N PC; 386/20N PC;        | 70  |     | 280 |     |     |
| 386/25N PC; 386/33N; 386/33N          |     |     |     |     |     |

| IBM                                   | 1Mb | 2Mb | 4Mb | 8Mb | 16M |
|---------------------------------------|-----|-----|-----|-----|-----|
| PS/1 286 (2011); PS/1 386SX (2121)    |     | 75  | 140 |     |     |
| PS/1 PRO 386SX (2123); (2133- 72PIN); | 36  | 62  | 120 | 220 | 440 |
| (2155 72PIN); (2168- 72PIN);          |     |     |     |     |     |
| PS/ValuePoint (6381); (6382); (6384-  |     |     |     |     |     |
| 72PIN); (6387)                        |     |     |     |     |     |
| PS/1 (2133- 30PIN); (2155- 30PIN);    |     |     | 110 |     | 420 |
| PS/ValuePoint (6384- 30PIN)           |     |     |     |     |     |

|  |    |    |     |     |     |
|--|----|----|-----|-----|-----|
| PS/2 25/286; 30/286                      | 83 |    |     |     |     |
| PS/2 35LS; 35SX; 40SX; 50Z; 55LS;        | 40 | 70 | 120 | 220 |     |
| 55SX; 56SLC; 56SLC L5; 56SX; 56LS;       |    |    |     |     |     |
| 57SLC; 57SX; 65SX; 70; 80; 90 XP 486;    |    |    |     |     |     |
| 95 XP 486 (8595); E (9533); Server 85;   |    |    |     |     |     |
| Premier PS/2 56; 57; 76; 77; Ullmedia-   |    |    |     |     |     |
| MS7; M77                                 |    |    |     |     |     |
| PS/2 95 XP 486 (9595); Server 95 (9595); |    |    | 140 | 260 | 480 |
| Server 95 Array (9596)                   |    |    |     |     |     |
| PS/2 Series 16/32 Bit MCA Exp. Board     |    |    | 194 | 240 | 360 |
| (6450609 & 34F3077)                      |    |    |     |     |     |

| ZENITH                                   | 2Mb | 4Mb | 8Mb | 16M | 32M |
|--|-----|-----|-----|-----|-----|
| Z-386SX; Z-386SX/20; Z-325/SX            | 70  |     | 210 |     |     |
| Z-386/20; Z-386/25; Z-386/33; Z-386/33E; |     | 115 |     |     |     |
| Z-486/25E                                |     |     |     |     |     |
| Z-486/33ET                               |     | 140 |     | 440 |     |
| Z-420/SX; Z-425/SX; Z-433/DX; Z-433/SX;  |     | 115 |     | 440 |     |
| Z-Station 3255Sh; 3255N; 420Sh; 420Sn;   |     |     |     |     |     |
| 425Sh; 433Dh; 420Sh; 420Sn;              |     |     |     |     |     |
| 433Dh; 450Dh; Z-400+ Series              |     |     |     |     |     |
| Z-Server 425SE; 433DE; 450DE;            |     |     |     |     |     |
| EX 433DE; EX 450DE; EX P66E;             | 140 | 230 | 440 | 880 |     |
| LT 433DE; LT 466XE; LT P60E              |     |     |     |     |     |



## WORKSTATION MEMORY

| HEWLETT PACKARD                          | 4Mb | 8Mb | 16M  | 32M  | 64M |
|--|-----|-----|------|------|-----|
| HP 3000 9x7LX Series 917LX; 927LX;       |     |     |      |      |     |
| 937LX; 947LX; 957LX; 967LX;              |     |     |      |      |     |
| 9x7 Series 937; 947; 957; 967; 977; 987; |     |     |      |      |     |
| 9000 Series 807S; 817S; 827S; 837S;      |     |     |      |      |     |
| 847S; 857S; 867S; 877S; 887S; 897S       |     |     |      |      |     |
| HP Apollo 9000 Series 375; 380; 400d;    | 140 | 240 | 460  | 880  |     |
| 400s; 400t; 425s; 425t; 433s             |     |     |      |      |     |
| HP Apollo 9000 Series 382; 425e          | 140 | 240 | 460  |      |     |
| HP Apollo 9000 Series 700/RX 16Ca;       | 120 | 230 |      |      |     |
| 16C1; 19Ca; 19M1                         |     |     |      |      |     |
| HP Apollo 9000 Series 705; 710           | 300 | 580 | 1100 |      |     |
| HP Apollo 9000 Series 745i; 747i;        | 300 | 580 | 1100 | 2300 |     |
| 715/33; 715/50; 725/50                   |     |     |      |      |     |
| HP Apollo 9000 Series 720; 730; 735      |     | 580 | 1100 | 2300 |     |
| HP Apollo 9000 Series 750; 755           |     | 580 | 1100 | 2300 |     |

| IBM                                    | 4Mb | 8Mb | 16M | 32M  | 64M  |
|--|-----|-----|-----|------|------|
| Xstation 120; 130                      | 115 |     |     |      |      |
| RS/6000 POWERstation/POWERserver-      | 115 | 220 |     |      |      |
| 220 Series                             |     |     |     |      |      |
| RS/6000 POWERstation/POWERserver-      |     |     | 780 | 1150 | 2100 |
| 320; 320E; 320M; 340; 340R; 350; 350R; |     |     |     |      |      |
| 520; 520M; 530; 530E; 530M; 550; 550E; |     |     |     |      |      |
| 550S; 560; 560F; 580; 730; 930; 950;   |     |     |     |      |      |
| 970; 980                               |     |     |     |      |      |

| SUN MICROSYSTEMS                    | 4Mb | 8Mb | 16M | 32M | 64M  |
|-------------------------------------|-----|-----|-----|-----|------|
| Model 3/60; 3/80; 4/110             | 140 |     | 420 |     |      |
| SPARCstation ELC (4/25); IPX (4/50) |     |     | 480 |     |      |
| SPARCserver/SPARCstation 330; 370;  |     | 240 |     |     |      |
| 390                                 |     |     |     |     |      |
| SPARCstation SLC (4/20)             | 120 |     |     |     |      |
| SPARCstation IPC (4/40); 1 (4/60);  | 140 |     | 420 |     |      |
| 1+ (4/65); 2 (4/75)                 |     |     |     |     |      |
| SPARCstation Classic LC (4/15);     |     | 240 |     | 900 |      |
| LX (4/30)                           |     |     |     |     |      |
| SPARCserver/station/engine 10-      |     |     | 520 |     | 1950 |
| Model 30; Model 41; Model 52/54     |     |     |     |     |      |
| SPARCserver 630MP; 670MP; 690MP     |     |     |     |     | 1920 |



## CYRIX PROCESSOR UPGRADES

| UPGRADE PROCESSORS                    |     |
|---------------------------------------|-----|
| 80386SX - 16 & 20 MHz TO 486 - 40 MHz | 165 |
| 80386SX - 25 MHz TO 486 - 50 MHz      | 185 |
| 80386DX - 16 MHz TO 486 - 33 MHz      | 180 |
| 80386DX - 20 MHz TO 486 - 40 MHz      | 210 |
| 80386DX - 25 MHz TO 486 - 50 MHz      | 240 |
| 80386DX - 33 MHz TO 486 - 66 MHz      | 240 |
| NUMERIC CO-PROCESSORS                 |     |
| 80387SX - 0-33 MHz                    | 45  |
| 80387DX - 0-33 MHz                    | 45  |

## 30 & 72 PIN SIMM

| 30 PIN J.E.D.E.C. MODULES           | 60Ns | 70Ns | 80Ns | 100Ns |
|-------------------------------------|------|------|------|-------|
| 256K x 8 BIT - 2 CHIP               |      |      |      | 7     |
| 256 x 9 BIT - 3 & 9 CHIP            |      |      | 8    | 7     |
| 1MB x 8 BIT - 8 CHIP                |      | 30   |      |       |
| 1MB x 9 BIT - 3 CHIP                |      | 27   | 27   |       |
| 1MB x 9 BIT - 9 CHIP                | 32   | 31   | 33   | 30    |
| 4MB x 9 BIT - 9 CHIP                | 108  | 105  | 105  |       |
| 16MB x 9 BIT - 9 CHIP               |      | 495  |      |       |
| 72 PIN J.E.D.E.C. MODULES           |      |      |      |       |
| 1MB = 256K x 36 BIT - SINGLE SIDED  |      |      |      | 40    |
| 2MB = 512K x 36 BIT - SINGLE/DOUBLE |      | 70   |      | 65    |
| 4MB = 1MB x 36 BIT - SINGLE SIDED   | 105  | 102  |      |       |
| 4MB = 1MB x 36 BIT - SINGLE/DOUBLE  | 120  | 115  |      |       |
| 8MB = 2MB x 36 BIT - DOUBLE SIDED   | 220  | 210  |      |       |
| 8MB = 2MB x 36 BIT - DOUBLE SIDED   | 230  | 220  |      |       |
| 16MB = 4MB x 36 BIT - SINGLE/DOUBLE | 460  | 440  |      |       |
| 32MB = 8MB x 36 BIT - DOUBLE SIDED  |      | 860  |      |       |

CALL FOR DYNAMIC RAM CHIPS

## PORTABLE MEMORY

| AST                                       | 1Mb | 2Mb | 4Mb | 8Mb | 16M  |
|---|-----|-----|-----|-----|------|
| BRAVO NB: ADVANTAGE EXPLORER              |     |     | 142 |     | 735  |
| PREMIUM EXECUTIVE 286/12;                 | 62  |     | 147 |     |      |
| 386SX/20; 386SX/25; 386SX/25C             |     |     |     |     |      |
| POWER EXECUTIVE 3/25SL; 3/25SL-C;         |     | 97  | 151 | 345 | 655  |
| 4/25SL (SE); 4/33SL; Colour; Colour +; EL |     |     |     |     |      |
| POWER EXECUTIVE 4/25SL; Colour;           |     |     | 167 |     | 614  |
| Colour Plus                               |     |     |     |     |      |
| CANON                                     | 2Mb | 4Mb | 8Mb |     |      |
| NoteJet 486/25 (BN-22)                    | 85  | 130 | 273 |     |      |
| NoteJet 486/33 (BN-22); 486C (BN-100C)    |     | 180 | 320 |     |      |
| NoteJet II 486C (BN-32P)                  | 85  | 145 | 280 |     |      |
| COMMODORE                                 | 2Mb | 4Mb |     |     |      |
| C286-LT; C386SX-LT (16 MHz)               | 84  |     |     |     |      |
| C386SX-LT (20 MHz)                        |     | 181 |     |     |      |
| COMPAQ                                    | 1Mb | 2Mb | 4Mb | 8Mb | 16M  |
| CONCERTO 4/25; 4/33; LTE ELITE            |     |     | 148 | 284 | 710  |
| CONTURA 3/20; 3/25; 3/25C                 |     | 43  | 163 | 238 |      |
| CONTURA 4/25; 4/25C; 4/25EX; 4/25EX       |     |     | 273 | 347 | 638  |
| CONTURA AERO                              |     |     | 150 | 310 |      |
| LTE 286                                   | 40  | 74  | 100 |     |      |
| LTE 386s/20                               | 77  |     | 176 |     |      |
| LTE LITE/20; LITE/25; LITE/25C;           |     | 60  | 176 | 340 | Call |
| LITE/25E                                  |     |     |     |     |      |
| LTE LITE 4/25; 4/25C; 4/25E; 4/33C        |     |     | 148 | 288 | 694  |
| PORTABLE 486/66; 486C/66                  | 47  | 74  | 130 | 250 |      |
| SLT 286                                   | 70  |     | 222 |     |      |
| SLT 386s/20                               | 60  | 84  | 174 |     |      |
| DELL                                      | 2Mb | 8Mb |     |     |      |
| 212N; 320N; 320N +                        | 84  |     |     |     |      |
| 316LT; 320LT; 320LX                       | 70  |     |     |     |      |
| 320SLI; 325SLI                            | 87  | 314 |     |     |      |
| 325N; 325NC                               | 88  |     |     |     |      |
| NL20; NL25                                | 84  |     |     |     |      |
| EVEREX                                    | 2Mb |     |     |     |      |
| TEMPO CARRIER                             | 90  |     |     |     |      |
| TEMPO LX                                  | 88  |     |     |     |      |



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| PS/2 L40 SLX; N33 SX; PS/NOTE 182   |     | 87   | 168  | 296  |      |
| PS/2 N51 SLX; N51 SX  |     | 77   | 157  | 322  |      |
| PS/2 P70 031; 061; 121; P75   | 40  | 74   | 130  | 250  |      |
| PS/Note 2618 C45; E35; M40;   |     |      | 168  | 322  | 527  |
| Thinkpad 350/C  |     | Call |      |      |      |
| PS/NOTE N45 SL  |     | 80   |      | 287  |      |
| THINKPAD 300  |     |      |      | 330  |      |
| THINKPAD 600  |     |      | 170  | 330  |      |
| THINKPAD 710T   |     | 87   | 160  | 315  |      |
| THINKPAD 360; 360C; 360CS; 360P; 750; 750C; 750CS; 750P; 755C; 755CS                                    |     |      | 176  | 347  | 679  |
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| T1600   |     |      | 54   |      |      |
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| T5100   |     |      | 63   |      |      |
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| MASTERSPORT 386SX   |     |      | 101  |      |      |
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| Z-NOTE 320L; 320Lb; 325L; 325Lc; 325Lp  |     |      | 80   |      | 287  |
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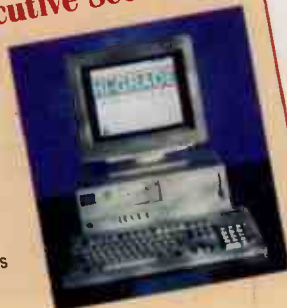
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| HL-6V                         |      |      | 103 | 165 |      |

|   |  |     |      |      |      |
|---|--|-----|------|------|------|
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| LBP-4; 4 LITE; 4 PLUS                                 |  | 90  | 120  |      |      |
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| LBP-430   |  | 43  | 135  |      |      |
| LBP-8II; 8IIR; 8IIT                                   |  | 72  | 110  |      | 187  |
| LBP-8III; 8III PLUS                                   |  | 104 | 134  | 164  |      |
| LBP-8IV; 4U   |  | 40  |      |      | 130  |
| LBP-8SX   |  | 75  | 110  |      |      |
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| EPL-7000  |  | 24  | Call | Call |      |
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| LASERJET II; IIi                                      |  |     | 72   | 110  | 187  |
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| 6A (4029-021); 10 (4029-030);                         |  |     |      |      |      |
| 10A (4029-041); 10L (4029-040);                       |  |     |      |      |      |
| (4037-5E)   |  |     |      |      |      |
| LaserPrinter 4039 10R; 10R DUPLEX;                    |  |     |      | 130  | 250  |
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| F-1200S (Pre 92); 2000A; 3000A;                       |  | 76  | 160  | 219  |      |
| 3300 (Pre 92)   |  |     |      |      |      |
| FS-1500 & 1500A                                       |  | 60  | 106  | 245  |      |
| <b>MANNESMAN TALLY</b>                                |  | 1Mb | 2Mb  | 4Mb  |      |
| MT-904; 904 PLUS                                      |  | 62  |      |      |      |
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| <b>OLIVETTI</b>                                       |  | 2Mb | 4Mb  |      |      |
| PG-108; 208   |  | 110 | 187  |      |      |
| PG-308  |  | 115 | 193  |      |      |
| <b>OKI</b>  |  | 1Mb | 2Mb  | 4Mb  |      |
| OL 400  |  | 58  | 87   |      |      |
| OL 400e; 400ex; 410ex                                 |  | 72  | 102  | 162  |      |
| OL 410; 810   |  | 77  | 107  | Call |      |
| OL 800; 820   |  | 62  | 92   | 152  |      |
| OL 830; 840; 850                                      |  |     | 117  |      |      |
| <b>PANASONIC</b>                                      |  | 32K | 1Mb  | 2Mb  | 4Mb  |
| KXP-11241   |  | 15  |      |      |      |
| KXP-4410; 4430  |  |     | 63   | 93   | 153  |
| KXP-4420; 4450; 4451                                  |  |     | 62   | 92   | 152  |
| KXP-4400; 5400  |  |     | 62   | 93   | 173  |
| KXP-4440; 5410  |  |     | 74   | 104  | 178  |
| KXP-4450  |  |     | 73   |      |      |
| KXP-4455  |  |     |      | 118  |      |
| <b>QMS</b>  |  | 1Mb | 2Mb  | 4Mb  | 8Mb  |
| COLOURSCRIPT 210; 230                                 |  | 40  |      | 130  | 240  |
| PS-410  |  | 70  | 99   | 159  |      |
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| JX-9400; 9460; 9600; 9600PS; 9660;                    |  | 65  |      | 98   | 178  |
| 9700E   |  |     |      |      |      |
| JX-9500; 9500E; 9500H; 9700; 9700E;                   |  | 73  | Call |      | 140  |
| 9700H   |  |     |      |      | 209  |
| JX-9500PS   |  | 58  |      |      |      |
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| MICROWRITER; PS17; PS35                               |  | 68  | 107  |      |      |

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Expansion slot for docking station  
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## pcD4000 Series

The pcD4000 series features 486 dx-2 and dx-4 processors running at 66, 75 and 100MHz.

- 4Mb RAM (expandable)
- 256K Cache
- 14" SVGA Colour Monitor
- 486 VL-Bus Motherboard
- 3.5" 1.44Mb Floppy Drive
- 102 Key Keyboard
- VLB IDE Enhanced Controller
- 1Mb VL-Bus SVGA Graphic Card
- 1 Year On-Site Warranty (optional 2 or 3 Year)
- (2 x Serial, 1 x Parallel and one Games Port)
- Desktop Mini Tower Case

| Model      | Processor     | 250Mb   | 420Mb   | 540Mb   | 1.0Gb    |
|------------|---------------|---------|---------|---------|----------|
| pcD4660dx2 | 486dx2 66MHz  | £729.00 | £759.00 | £789.00 | £999.00  |
| pcD4750dx4 | 486dx4 75MHz  | £799.00 | £829.00 | £859.00 | £1069.00 |
| pcD4100dx4 | 486dx4 100MHz | £859.00 | £889.00 | £919.00 | £1129.00 |

## pcD5000 Series

The pcD5000 Series features the startlingly fast Intel Pentium® processor running at 75, 90 or 100MHz and include:

- Intel CPU with Heat Sink and Fan
- 3 x PCI and 4 x 16bit ISA Slots
- 3 Button Serial Mouse
- 8Mb RAM (expandable)
- 3.5" 1.44Mb Floppy Drive
- 102 Key Keyboard
- 256K Cache
- 1Mb PCI Graphic Card
- 1 Year On-Site Warranty (extendable to 2 or 3 years)
- IDE Enhanced Controller
- Desktop or Mini Tower
- 15" SVGA colour Monitor
- (2 x FDD, 2 x Serial and 1 x Parallel Port)

| Model   | Processor       | 540Mb    | 1.0 Gb   |
|---------|-----------------|----------|----------|
| pcD5750 | Pentium® 75MHz  | £1339.00 | £1584.00 |
| pcD5900 | Pentium® 90MHz  | £1499.00 | £1749.00 |
| pcD5100 | Pentium® 100MHz | £1619.00 | £1869.00 |

## Value Multimedia Option

Our Value Multimedia option takes advantage of all the features of the pcD4000 and pcD5000 Series adding the following features:

- Desktop case
- Panasonic dual speed internal CD-ROM
- Microsoft Encarta
- External 25W Active speakers
- Creative Labs SoundBlaster 16 Value

| Model       | Processor       | 250Mb    | 420Mb    | 540Mb    | 1.0Gb    |
|-------------|-----------------|----------|----------|----------|----------|
| pcDM4660dx2 | 486dx2 66MHz    | £929.00  | £959.00  | £989.00  | £1199.00 |
| pcDM4750dx4 | 486dx4 75MHz    | £999.00  | £1029.00 | £1059.00 | £1269.00 |
| pcDM4100dx4 | 486dx4 100MHz   | £1059.00 | £1089.00 | £1119.00 | £1329.00 |
| pcDM5750    | Pentium® 75MHz  | -        | -        | £1539.00 | £1784.00 |
| pcDM5900    | Pentium® 90MHz  | -        | -        | £1699.00 | £1949.00 |
| pcDM5100    | Pentium® 100MHz | -        | -        | £1819.00 | £2069.00 |

MS-DOS V6.2 and Windows V3.11 £75

## CD ROMs

Mitsumi FX300 CD ROM Triple speed internal, includes interface Only £114

Matsumi FX400D Quad speed, IDE, 230ms access time £139

Panasonic CR-562B Internal Dual Speed 320ms. Motorised Tray. MPC and Photo CD Standard £89

NEC Quad Speed Internal CD-ROM £169

Blue Point ICD-300 Internal IDE Dual Speed. No interface required. Just plug into your IDE controller and play! £85



## Monitors

14" Mono VGA £75

14" SVGA Low Radiation 28DP Colour Monitor £159

14" SVGA Non Interlaced 1024x768, 0.28 low radiation, MPRII £179

15" SVGA Energy saving \* approved, flat screen. Non Interlaced FST .28DP, 1024x768 & 1280x1024, low radiation, MPRII £239

**SPECIAL OFFER**

17" Colour Monitor .26DP, low radiation. Microprocessor for power control. £439



## Components

### Motherboards

486 VLB Latest high quality motherboard 256K cache, upgradeable to 64Mb RAM, two 72 pin SIMMS and 30 pin SIMM sockets. 6 x 16 bit ISA, 3 x 32 bit VLB expansion slots, ZIFF socket expandable to INTEL DX4. Takes Cyrix/AMD/INTEL CPUs. £78

486 PCI/ISA Motherboard Onboard enhanced IDE, fast serial card, 4 x 72 pin SIMMS, Award Bios, SIS chipset, Pentium® Overdrive socket and LBA mode HD support. £129

Intel Plato 75/90/100 Motherboard 3.3 Volt, 3 x PCI and 4 x ISA, Intel Neptune chipset, Flash Bios, 4 x 72 pin sockets (useable in banks of 2), onboard enhanced IDE I/O card. Plug and play compatible. £249

Pentium® 90/100 Motherboard 256K cache, SIS chipset (without built-in enhanced controller) £139

Super Micro Pentium® 90/100/120 Made in the USA. 256K Cache, 4 x PCI, 1 x VLB, 5 x ISA Includes a Flash EPROM Bios. £179

AIR 90/100 Pentium® EISA/PCI 512K Cache, Adaptec 7870 SCSI-2 with Multi I/O Controller £499

AIR 90/100 Pentium® PCI/VL-Bus 256K Cache, IDE Mode 3 Super I/O Controller £279

AIR 90/100 Pentium® PCI/VL-Bus 512K Cache, IDE Mode 3 Super I/O Controller £299

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### Intel CPUs

486DX2 66MHz £118

486DX4 75MHz £138

486DX4 100MHz £185

Pentium® 75MHz £248

Pentium® 90MHz £429

Pentium® 100MHz £549

### AMD CPUs

486DX2 66MHz £97

486DX2 80MHz £108

486DX4 100MHz £168

### Cooling Fans

486DX £8 Pentium®: 60/66MHz £9 90MHz £9.50

### Hard Drives

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340Mb IDE £119 540Mb SCSI £160

420Mb IDE £125 1.0Gb SCSI £379

520Mb IDE £139 2.0Gb SCSI £799

### Cases

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16Bit Combo BNC/AUI/RJ45 £45

Pocket LAN Parallel Port £69

VL-Bus Ethernet Card Combo £99

PCI Combo Ethernet Card £129

PCMCIA BNC Ethernet Card £119

Boot ROM £5

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- 8Mb SIMMS 70ns 72 Pin with parity £249
- 16Mb 70ns (72 Pin) £379
- 16Mb SIMMS 70ns with parity £399
- 32Mb SIMMS 70ns (72 Pin) £799

### Graphics Cards

ISA 1Mb SVGA £49

VLB/PCI

- 1Mb SVGA Cirrus Logic 5428 £59
- 1Mb SVGA Cirrus Logic 5429 - 35% Faster! £65
- 1Mb Cirrus 64Bit 5434 VLB/PCI £99
- 1Mb Diamond Stealth 64 VLB/PCI £105
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- 2Mb Cirrus 64Bit 5434 VLB/PCI £139
- 2Mb VRAM Diamond Stealth 64 VLB/PCI £239
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For other cards please call

### Fax Modems

Internal Fax Modem Fully BABT approved, 14,400bps, V21, V22 bis and V32 bis data. Telephone plug and cable, software and manual included. Trio Datafax (DOS, Windows) 5 year warranty. £79

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Iomega Tape Streamers Fits in a 3.5" Floppy Bay, and are optimised for Windows and DOS. Back-up software allow you to back up automatically without interrupting your work - even at night!

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Parallel Card £10

Fast Serial Card £28

VLB Enhanced IDE I/O 4 x HDD, 1 x Parallel, 2 x Serial and 1 x Game £19

Enhanced IDE I/O

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PCI PCI IDE (Mode 3) Paddle Board & I/O £39

PCI SCSI-2 (CMD 6500) £169

Promise DC5030 PCI IDE 0K expandable to 16Mb Cache £129

### Floppy Drives

Panasonic/Sony/Mitsumi 3.5" 1.44Mb Floppy Drive £21

5.25" Floppy Drive £39

Floppy Fitting Kit 3.5" into 5.25" £5

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### Mouse & Keyboard

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3-Button Mouse £8

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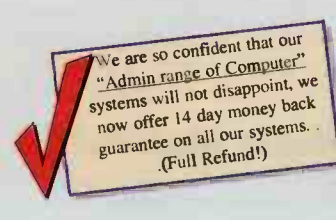
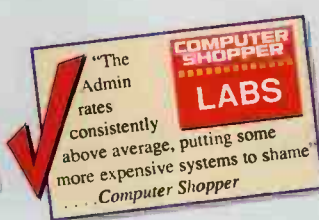
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102 Key enhanced keyboard  
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|------|---------|---------|
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### Admin Green Upgrades . . .

|                                    |                                  |                           |                                    |                                   |
|------------------------------------|----------------------------------|---------------------------|------------------------------------|-----------------------------------|
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| 5.25 (1.2mb) Floppy Drive . . .£32 | 730Mb IDE Hard Disk . . . .£29   | 17" Monitor . . . . .£299 | MS Windows for Workgroups 3.11 £49 | 2 Year On-Site Warranty . . .£95  |
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# A D M I N

# C U R E



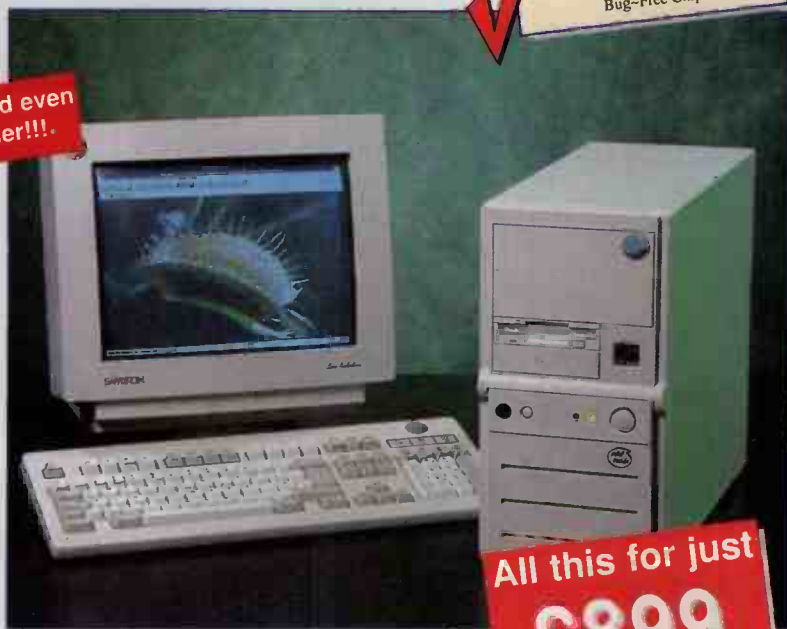
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**66MHz**  
**£1149**

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| Gem/fax Pocket V22.bis.....         | £58   |
| Gem/fax PCMCIA.....                 | £149  |
| <b>Hypergem:</b>                    |       |
| New desktop V34.....                | £POA  |
| New Portable V34.....               | £POA  |
| New Internal V34.....               | £POA  |
| <b>Hayes:</b>                       |       |
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| Optima 28.8 + fax.....              | £429  |
| Ultra 24.....                       | £219  |
| Ultra 96.....                       | £395  |
| Ultra 14.4.....                     | £467  |
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| NEW Linnet 32+VFX.....              | £POA  |
| "Message Desk".....                 | £POA  |
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| <b>Internal Version</b>             |       |
| Microlin FX32+.....                 | £149  |
| Microlin FX.....                    | £87   |
| NEW Microlin FX34.....              | £POA  |
| <b>PCMCIA Version</b>               |       |
| Microlin FX +NB32+.....             | £199  |
| NEW Microlin FX NB 34.....          | £POA  |
| Mobilax 24.....                     | £79   |
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| Microlin FX32+.....                 | £169  |
| NEW Microlin FX34.....              | £POA  |
| NEW Mobilax 24 with free            |       |
| compuserve membership.....          | £POA  |
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| compuserve membership.....          | £POA  |
| Mobilax 144.....                    | £119  |
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| NEW Courier Dual Standard           |       |
| V.34 Fax with V.32bis.....          | £POA  |
| W/Port Dual STD.....                |       |
| Cell PCMCIA.....                    | £199  |
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| Cell Portable.....                  | £179  |
| Sportster Int. 14.4 Fax.....        | £129  |
| Sportster Ext. 14.4 Fax.....        | £129  |
| Sportster Ext. 14.4 Mac.....        | £139  |
| Sportster 28.8 V34 Ext.....         | £199  |
| Courier V34 Ext. Bundle.....        | £279  |
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|                            |     |
|----------------------------|-----|
| 3 Button Serial Mouse..... | £7  |
| MS Mouse 2.0.....          | £19 |
| PS 2 Mouse.....            | £19 |



## Cases with PSU

|                                 |     |
|---------------------------------|-----|
| Mini Tower with LED.....        | £29 |
| Desk Top with LED.....          | £29 |
| Full Tower.....                 | £79 |
| Deluxe Desktop Case TUV.....    | £49 |
| Desktop Multi-Media.....        | £99 |
| Stimline Case.....              | £49 |
| Deluxe Mini-Tower Case TUV..... | £49 |
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| Desktop/Minitower 200w PSU..... | £29 |
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| 300 watt PSU.....               | £49 |
| <b>Diamond Series</b>           |     |
| Desktop.....                    | £59 |
| Mini Tower.....                 | £59 |
| Power Cable.....                | £5  |



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|---------------------------------|-------|
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| 14" SVGA (0.28) MPRII LR.....   | £155  |
| 14" SVGA (0.28) N/LLR.....      | £169  |
| Hyundai Mono14".....            | £79   |
| View Sonic 14"6E.....           | £169  |
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|------------------------------------|------|
| <b>Colorado Drives</b>             |      |
| Jumbo DJ20 250Mb.....              | £93  |
| Jumbo DJ35 350MB.....              | £115 |
| Jumbo DJ25 700Mb.....              | £199 |
| Tracker 250Mb.....                 | £189 |
| Tracker 350mb.....                 | £239 |
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| HP2 CX scan.....               | £679  |
| Logitech Scanman 256 gray..... | £79   |
| Logitech scanman.....          |       |
| 32-pc+DOS.....                 | £59   |
| Logitech Scanman colour.....   | £169  |
| Epson GT6500 Parallel.....     | £497  |
| Epson GT6500 SCSI.....         | £725  |
| Epson GT8000 Parallel.....     | £670  |
| Epson GT8000 SCSI.....         | £740  |
| Epson GT8000 SCSI-Adobe.....   | £890  |
| Epson GT9000 SCSI.....         | £995  |
| Epson GT9000 SCSI-Adobe.....   | £1139 |
| Trust 1200 dpi flatbed.....    | £349  |
| Trust 2400 dpi flatbed.....    | £449  |
| ScanFX combined unit.....      | £339  |
| Dexxa sheetfeed col.....       | £239  |
| Dexxa hand held col.....       | £129  |



## I/O Controller Cards

|                                     |     |
|-------------------------------------|-----|
| <b>ISA</b>                          |     |
| Multi I/O.....                      |     |
| 2HDD,2FDD,2S,1P,1G.....             | £9  |
| Promise DC 200.....                 |     |
| 4IDE 2FDD OK.....                   | £75 |
| <b>VLB</b>                          |     |
| Multi I/O 2HDD 2FDD.....            |     |
| 2S 1P 1G enhanced.....              | £17 |
| CMD 6210 IDE mode 3 4IDE.....       |     |
| 2FDD 2S 1P.....                     | £28 |
| VL 410 mode 3 2IDE 2FDD (2.88)..... |     |
| 2S 1G 1P 16550.....                 | £49 |
| <b>PCI</b>                          |     |
| M1520 EIDE Mode 3.....              | £21 |
| CMD 6400 PCI mode 3 4IDE.....       |     |
| high speed.....                     | £26 |



## SCSI

|                                |      |
|--------------------------------|------|
| SCSI Adaptec 1542 AHA.....     | £134 |
| SCSI Adaptec 2940 PCI Kit..... | £199 |
| SCSI Adaptec 2742 EISA.....    | £249 |
| SCSI Adaptec 1542 Kit.....     | £179 |
| SCSI Adaptec 1508 8bit.....    | £49  |
| SCSI Adaptec 1522.....         | £109 |
| SCSI Adaptec T348 Kit.....     | £109 |
| Promise DC2040 ISA.....        | £149 |



## I/O Controllers

|                                  |     |
|----------------------------------|-----|
| Parallel port card.....          | £9  |
| Serial card.....                 | £9  |
| Serial with fast Uart 16550..... | £29 |
| 4 Port RS232.....                | £89 |



## Multimedia

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|---------------------------------|------|
| Soundblaster 16 Value.....      | £64  |
| Soundblaster 16 MCD.....        | £89  |
| Soundblaster 16 ASP MCD.....    | £113 |
| Soundblaster 16 SCSI.....       | £113 |
| Soundblaster 16 SCSI ASP.....   | £138 |
| Soundblaster 32 AWE2.....       | £169 |
| Orchid Gameware 32.....         | £79  |
| Soundrive EZ.....               | £65  |
| Soundrive EZ SCSI.....          | £79  |
| Soundwave 32 Pro.....           | £135 |
| Soundwave 32 Pro SCSI.....      | £149 |
| Wave Booster 4MB + FX.....      | £179 |
| Wave Booster 4MB CUE L.....     | £155 |
| Wave Booster 2MB CUE L.....     | £119 |
| <b>MULTIMEDIA BUNDLES</b>       |      |
| Discovery CD 16.....            | £229 |
| Gameblaster CD 16.....          | £229 |
| Digital Edge.....               | £369 |
| MS Office CD16.....             | £389 |
| Sony Fusion II Pack.....        | £169 |
| Longshine DS 16 Pack.....       | £139 |
| <b>CD ROM DRIVES</b>            |      |
| Mitsumi DS.....                 | £79  |
| Mitsumi FX300 triple speed..... | £114 |
| Mitsumi Quad speed 250ms.....   | £126 |
| NEC 3X1.....                    | £218 |
| NEC 3XP.....                    | £275 |
| NEC Quad-X IDE INT.....         | £163 |
| NEC Quad-X IDE EXT.....         | £218 |
| NEC SCSI Interface kit.....     | £59  |
| NEC Parallel SCSI IF. Kit.....  | £    |
| SCSI NEC 4X1 Quad INT.....      | £256 |
| Panasonic SCSI D S.....         | £106 |
| Panasonic Ext. SCSI.....        | £132 |
| Sony DS COV33A.....             | £96  |
| Sony CDU 55E 2.4X.....          | £89  |
| Panasonic CR562.....            | £85  |
| Panasonic 563CD.....            | £94  |
| Interface Kit.....              | £10  |
| <b>VIDEO/TV CODERS</b>          |      |
| Video Blaster RT300.....        | £275 |
| Video Blaster "FS200".....      | £244 |
| Video Spigot.....               | £93  |
| Creative MP4000.....            | £199 |
| TV Coder Int.....               | £109 |
| TV Coder Ext.....               | £125 |
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| Orchid Vidiola Pro.....         | £349 |
| Orchid Vidiola Premier.....     | £569 |
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| Video Logic Captivator Pro..... | £185 |
| Captivator Pro TV.....          | £239 |
| 1Mb 928 Movie ISA.....          | £185 |
| 1Mb 928 Movie VLB.....          | £185 |
| 1Mb 928 Movie ISA Sound.....    | £255 |
| 1Mb 928 Movie VLB Sound.....    | £255 |
| 2Mb PCI Movie.....              | £325 |
| 1Mb VRAM Upgrade.....           | £89  |
| 1Mb 928 Movie with              |      |
| MPEG Player ISA.....            | £429 |
| 1Mb 928 Movie with              |      |
| MPEG Player VLB.....            | £429 |
| MPEG Player for VMC.....        | £239 |
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| Reelmagic Full Version.....     | £325 |
| Diamond Videostar.....          | £289 |
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| Rombo Media Pro Plus.....       | £189 |
| Rombo TV Buster Int.....        | £49  |
| Rombo TV Buster Ext.....        | £49  |
| Rombo PC Tuner.....             | £69  |
| Intel Smart Recorder pro.....   | £299 |
| Flexicam Desktop TV Camera..... | £399 |
| Video conferencing.....         | £POA |



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| 256K VGA.....                  | £21  |
| 512K VGA.....                  | £27  |
| 1MB SVGA.....                  | £44  |
| Cirrus Logic 5428/9.....       | £49  |
| Cirrus Logic 5434 PCI 1Mb..... | £69  |
| Cirrus Logic 5434 PCI 2Mb..... | £99  |
| <b>Diamond Stealth Viper</b>   |      |
| VLB/PCI 2Mb VRAM.....          | £POA |
| DS 64 PCI/VLB 2Mb DRAM.....    | £POA |
| DS 64 PCI/VLB 2Mb VRAM.....    | £POA |
| DS 64 PCI/VLB 4Mb DRAM.....    | £POA |
| DS 64 PCI/VLB 4Mb VRAM.....    | £POA |
| Orchid Kelvin 64.....          |      |
| I64 ISA / PCI / VLB 2MB.....   | £129 |
| SA / PCI / VLB 1MB.....        | £99  |
| EZ 1MB VLB.....                | £99  |
| Fahrenheit.....                |      |
| VA 1MB High Colour.....        | £99  |
| 64 PCI/VLB 4MB DRAM.....       | £359 |
| 64 PCI/VLB 1MB DRAM.....       | £119 |
| 64 PCI/VLB 2MB DRAM.....       | £159 |
| Fahrenheit VA/VLB 1MB.....     | £139 |
| Pro 64 VLB 2MB DRAM.....       | £239 |
| <b>Techworks-ThunderBolt</b>   |      |
| 1Mb ISA.....                   | £59  |
| 1Mb ET4000 VLB.....            | £96  |
| 2Mb ET4000 VLB.....            | £135 |
| 1Mb -T 9420 DGiPCI.....        | £75  |
| 2Mb -T 9420 DGi PCI.....       | £116 |

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| <b>Toshiba</b>          |      |
| TF511.....              | £499 |
| TFP71.....              | £299 |
| <b>Brother</b>          |      |
| NEW FX475M.....         | £POA |
| NEW FX 490DT.....       | £POA |
| NEW FX 5000P.....       | £POA |
| Fax 1400M.....          | £399 |
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| <b>BT</b>               |      |
| DF100.....              | £209 |
| DF200.....              | £269 |
| BF800 Laserfax.....     | £749 |

## Panasonic

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| UF - 745.....   | £1099 |
| UF - 322EAs UF321 also with memory and semi dual operation..... | £675  |
| UF - 755E The latest and best plain paper laser fax.....        | £1299 |
| PC Interface Option.....  | £199  |
| V24 / Encryption.....   | £249  |
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| The old 3 in 1 favourite.....                                   | £279  |
| KXF - 2400E.....  |       |
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| Fax 950.....  | £POA  |

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| 730MB AC2700A 10ms 128k Cache 3YR Warranty | £181 |
| 850MB AC2850A 12ms 128k Cache 3YR Warranty | £174 |
| 1GB AC31000A 10ms 128k Cache 3YR Warranty  | £253 |

### QUANTUM

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| 540MB MV 540AT 14ms 128k Cache 2YR Warranty | £122 |
| 725MB LT 540AT 10ms 128k Cache 2YR Warranty | £132 |
| 730MB LT 730AT 11ms 128k Cache 2YR Warranty | £151 |

### MAXTOR

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| 540MB 7540A12ms 256k Cache 1YR Warranty  | £115 |
| 850MB 7850AV12ms 256k Cache 1YR Warranty | £171 |

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| 428MB ST3491A 15ms 120k Cache 3YR Warranty  | £114 |
| 545MB ST3660A 14ms 120k Cache 3YR Warranty  | £124 |
| 725MB ST 3780A 12ms 256k Cache 3YR Warranty | £170 |
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| 1GB ST 31220A12ms 256k Cache 3YR Warranty   | £247 |

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| 1.05GB ST 31200N SCSI 9ms 256k Cache 3YR Warranty      | £POA |
| 1.7GB ST11900N SCSI Hawk                               | £POA |
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| 4.0GB ST 15 150N 9ms 512k Cache 5Yr Warranty           | £POA |

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| 420MB CSF 420A 13ms 32k Cache 1YR Warranty  | £109 |
| 540MB CFA 540A 15ms 256k Cache 1YR Warranty | £126 |
| 810MB CFA 810A 12ms 256k Cache 1YR Warranty | £POA |
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| 528MB M2684T IDE 14ms 256k Cache 2YR Warranty      | £132  |
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| IDE 1Gb MIC4110A 9ms 512k Cache 5Yr Warranty       | £POA  |
| SCSI II 1.6GB MIC2217 10ms 512k Cache 5Yr Warranty | £595  |
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| 3.5" Floppy (1.44)        | £23 |
| 5.25" Floppy (1.2)        | £35 |
| Removable Hard Drive Rack | £28 |
| Fixing Ki                 | £5  |
| Hard Drive Cables         | £5  |
| ISA Multi I/O             | £10 |
| VLB Multi I/O 4HDD 2FDD   |     |
| 2S 1P Mode 3 (1Gb)        | £17 |
| PCI Multi I/O             | £19 |



## Motherboards

### 486 VESA Motherboards



|   |     |
|---|-----|
| 486SX/DX/DX2-66 256k cache, VL-BUS Zif, SIS471, 472 pin simm, dark green  | £69 |
| 486 SX/DX2/DX4-100 256K, VL-BUS, Zif, SIS471, 472pin simm, dark green   | £75 |
| 486SX/DX2-66 256K, VLBUS, Zif, SIS471, 8*30pin +2*72pin simm dark green (limited stock)   | £75 |
| 486 new GREEN, 256K (max 512K), 3 VESA, With 3 Slaves / 2 Master Vesa Bus 2 72 pin and 4 30 pin simm (max128)260mm (L) x 220mm (W), PC/SIS chipset, AWARD (GREEN BOIS) DX4 Support, Ziff Socket | £69 |



## Memory

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|--------------------------------------|--------|
| Prices changing please confirm price |        |
| We only sell top branded modules:    |        |
| 1Mb X 9 70ns 3 Chip                  | £26.50 |
| 4Mb X 9 70ns 3 Chip (30pin)          | £97    |
| 1 X 32 bit 70ns 72pin (4Mb)          | £97    |
| 2 X 32 bit 70ns 72 pin (8Mb)         | £199   |
| 2 X 36 bit 70ns 72 pin (8Mb)         | £229   |
| 4 X 32 bit 70ns 72 pin (16Mb)        | £299   |
| 4 X 36 bit 70ns 72 pin (16Mb)        | £349   |
| 8 X 32 bit 70ns 72 pin (32Mb) EPOA   |        |
| 8 X 36 bit 70ns 72 pin (32Mb) EPOA   |        |



## Keyboard

|                     |     |
|---------------------|-----|
| 102 key standard    | £10 |
| Cherry Membrane     | £25 |
| MS Natural Keyboard | £69 |

### 486 PCI Motherboards

|  |     |
|--|-----|
| 486SX/DX/DX2-66, 256k cache, 3*PCI, Zif, SIS496, 472pin SIMM, dark green | £79 |
| 486SX/DX/DX4, 256k cache, 3*PCI, Zif, SIS496, 472pin SIMM, dark green    | £85 |

### New VIP

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|---|-----|
| VESA, ISA, PCI MOTHERBOARD Intel 486SX up to DX4, Zif Socket, 256K Cache (1Mb Max), 4 72 Pin simm (256 Max) 4 PCI 2 Vesa 4 ISA AWARD GREEN PC BIOS, 300mm X 220mm BARE BOARD (NO CPU) Supports write back mode CPU internal level cache | £89 |
|---|-----|

### Pentium Chip Motherboards

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|----------------------|------|
| Intel Pentium 60 PCI | £189 |
| Intel Pentium 90 PCI | £219 |
| Elite P60 PCI        | £99  |
| Elite P90 PCI        | £159 |
| Gibabyte P60 PCI     | £159 |
| Gibabyte P90 PCI     | £199 |



## CPU'S

|  |      |
|--|------|
| Intel 486SX 25                         | £49  |
| Intel 486SX 33                         | £55  |
| Intel 486SX 2-50                       | £59  |
| Intel 486DX 33                         | £99  |
| Intel 486DXII 50                       | £89  |
| Intel 486DXII 66                       |      |
| Intel 486DX4/100                       |      |
| Intel Pentium 60MHz                    | £209 |
| Intel Pentium 66MHz                    | £209 |
| Intel Pentium 90MHz                    | £399 |
| Heat Sink Fan                          | £9   |
| Heat sink Pentium60MHz + Pentium 90MHz | £17  |



## Optical Drives

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|----------------------------|------|
| FUJITSU M2511A, 128Mb, Int | £425 |
| M2511A/X, 128Mb, Ext       | £525 |
| M2312A, 230Mb, Int         | £540 |
| M2512A/X, 230Mb, Ext       | £640 |

## Dot Matrix, Ink Jets & Laser Printers



## INK JET PRINTERS

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|------------------------------|------|
| EPSON NEW Stylus Colour      | £329 |
| NEW Stylus 800 + Stylus 1000 | £179 |
|                              | £319 |



|                           |         |
|---------------------------|---------|
| STAR SJ144 Limited stocks | £169.36 |
| CANON BJ200               | £189    |
| BJ230                     | £254    |
| BJ300                     | £369    |
| BJ330                     | £396    |
| BJC - 600                 | £328    |
| NEW BJC4000c              | £249    |

### HEWLETT PACKARD

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| NEW Deskjet 540             | £POA  |
| 540 Colour Kit              | £29   |
| NEW Deskjet 660             | £POA  |
| Deskjet 320                 | £149  |
| Deskjet 320 + SSF           | £265  |
| Deskjet 560C Limited stocks | £POA  |
| Deskjet 1200C +             | £299  |
| Deskjet 1200PS              | £1269 |
| Paintjet XL300              | £1569 |
| Paintjet XL300PS            | £2569 |
| NEW XL300                   | £2753 |



## LASER PRINTERS

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| BROTHER HL 660            | £479  |
| HL - 1260                 | £999  |
| HL - 630                  | £329  |
| NEC Nec Superscript 610+  | £289  |
| Nec Superscript 660       | £415  |
| Nec Superscript 660i      | £565  |
| Nec Superscript Col. 3000 | £639  |
| OKI OL400ex 4PPm          | £359  |
| OL410ex 4PPm 600dpi       | £479  |
| KYOCERA FS400 4ppm        | £POA  |
| FS1550 10ppm              | £POA  |
| FS1600 10ppm 600dpi       | £POA  |
| PANASONIC NEW KXP 6100    | £POA  |
| KXP 4400                  | £279  |
| KXP 4401                  | £344  |
| KXP 4430                  | £484  |
| KXP 4440                  | £714  |
| KXP 5400PS                | £545  |
| CANON LBP 4i              | £399  |
| LBP- 8 MK4                | £919  |
| STAR Wintype 800c Colour  | £POA  |
| NEW Wintype 4000          | £299  |
| HP LASERJET HP 4Mv (A3)   | £1989 |
| HP 4L                     | £389  |
| 4ML                       | £739  |
| HP 4 plus                 | £945  |
| HP 4M plus                | £1265 |
| HP4Si                     | £2099 |

|                    |       |
|--------------------|-------|
| HP 4Si MX          | £2975 |
| HP 4P              | £599  |
| HP 4MP             | £855  |
| HP4V               | £1379 |
| HP colour laserjet | £4279 |

|                          |      |
|--------------------------|------|
| HP SUPPORT PACKS 310/520 | £39  |
| 500/500c/560c            | £64  |
| 1200/XL300               | £98  |
| 4L                       | £98  |
| 4P/4MP                   | £124 |
| 4/M                      | £155 |
| 4Si                      | £459 |



## Dot Matrix Printers

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|-----------|------|
| KXP 2135c | £129 |
| KXP2124C  | £238 |
| KXP2624   | £254 |
| KXP 3626  | £269 |

|              |      |
|--------------|------|
| EPSON LX 300 | £91  |
| LX 1050      | £169 |
| FX 870       | £225 |
| FX 1170      | £282 |
| LQ 100       | £99  |
| LQ 150M      | £117 |
| LQ 150C      | £159 |
| LQ 300       | £147 |
| LQ 570+      | £189 |
| LQ870        | £357 |
| LQ1070       | £289 |
| LQ1170       | £405 |

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| SU 496 4 in 1 out manual parallel   | £28 |
| SU969 X over manual parallel  | £28 |
| Manual Serial T Switch SU128 2 in 1 out manual serial                                       | £18 |
| SU673 4 in 1 out manual serial  | £25 |
| SU850 X over manual Serial  | £28 |
| Keyboard & Minter Switches TM0313 2 Way XT/AT   | £42 |
| TM0314 4 Way XT/AT  | £51 |
| TM0315 2 Way PS/2   | £51 |
| TM0316 4 Way PS/2/54 Automatic Parallel T Switch NS244 2 in 1 out auto parallel pocket size | £48 |



## HP Design Jet Plotters

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|-------------------|-------|
| DJ 220 A1/A4      | £1496 |
| DJ 220 AO/A4      | £1964 |
| DJ 600 A1/A4      | £2810 |
| DJ 600 AO/A4      | £3360 |
| DJ 650c A1/A4     | £3846 |
| DJ 650c AO/A4     | £4541 |
| Calcomp Plotters  | £POA  |
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| Roland DXY1250 A3 | £718  |
| Roland DXY1350 A3 | £939  |

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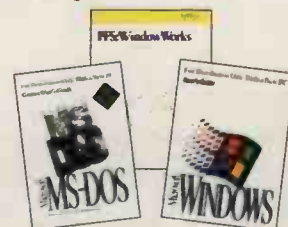
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Finally, just to get you started, we've pre-installed PFS Windows Works, an integrated software package that gives word processing, spreadsheet, data-base and modem facilities. The Mitac Popular is delivered ready to go!



Distributed by: Actinet Computers Ltd

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# PCs

**NEXT DAY** 

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## CLICK DX2-66 8/540

 **£899** <sup>+VAT</sup>



- Genuine Intel 486dx2-66 processor
- 8Mb RAM upgradeable to 128Mb
- 540Mb IDE hard disk with local bus hard disk controller
- 3.5" 1.44Mb floppy drive
- Local Bus Cirrus Logic 1Mb video card (upgradeable to 2Mb)
- Parallel, serial, joystick, and mouse port
- 5 free expansion slots including 1 VESA local bus slot
- 14" SVGA colour monitor
- includes 102 key keyboard and mouse
- Supplied with
- MS-Dos 6.2 and MS Windows for Workgroups 3.11
- 1 years onsite maintenance warranty

**As above with Pentium P60..... £999**

## CLICK NOTEBOOKS

- 486 DX processor
- 4Mb memory upgradeable to 20Mb
- Built in 1.44Mb 3.5" floppy drive
- Fast removable 2.5" 340Mb IDE hard drive upgradeable to 810Mb
- Soundblaster compatible - Multimedia ready
- Built in speaker and microphone
- 9.5" mono LCD with 64 grey levels or either
- 256 colour Dual scan passive or active TFT displays.
- Built in accelerated local bus video with 1Mb RAM capable of providing simultaneous support of LCD and external VGA monitor
- Full function 86 key keyboard
- Built in high quality trackball
- 1 EPP compliant parallel port, 1 9-pin serial port, external mouse/keyboard socket, external audio ports, external VGA port, and port for docking station
- Choice of 2 type II or 1 type III PCMCIA card slot
- NiMH removable battery pack quick recharge 90 mins, 5 hours continuous operation
- Power management BIOS featuring suspend to disk function and battery level meter
- Multi-voltage AC adaptor
- Weight ~ mono - 2.4kg colour - 2.7kg

**Upgrade to 8Mb ~ £129**  
**Upgrade to 540 Hdd ~ £99**



| Model      | Mono  | Dual Scan Colour | TFT Active Colour |
|------------|-------|------------------|-------------------|
| 486DX2-50  | £1082 | £1377            | £2058             |
| 486DX2-66  | £1111 | £1406            | £2087             |
| 496DX4-75  | £1137 | £1431            | £2112             |
| 486DX4-100 | £1183 | £1478            | £2159             |

## COMPAQ Presario

PRESARIO  
CDS510

**£1015** <sup>+VAT</sup>



- 486sx-33 processor
- 4 MbRAM expandable to 64Mb
- 270Mb hard disk
- 3.5" 1.44Mb floppy drive
- Local bus SVGA graphics
- Parallel, serial, joystick, MIDI, and mouse ports
- Integrated 16bit stereo soundcard with microphone and speakers
- Dual speed multi-session CD-ROM drive
- Built in 9624 faxdata modem with telephone answering facility
- Integral 14" low radiation SVGA monitor
- Supplied with:-
- MS-Dos 6.2, Windows 3.1, Tabworks, Welcome centre, Control centre and Learning centre
- Microsoft Works v3, MS money and Ms Entertainment
- Microsoft encarta CD and The Ultimate Human Body CD
- 3 Year Compaq warranty

CDS520 486sx2-66 420Mb ..... **£1094**  
RAM upgrade to 8Mb ..... **£175**

## COMPAQ NOTEBOOKS

### Compaq Contura Aero



- 486sx-25 or sx-33 processor
- 4 Mb RAM expandable to 12 Mb
- 170 Mb or 250 Mb hard disk
- External PCMCIA floppy drive
- Compact 78 key keyboard
- Integrated trackball
- Ports: Serial, parallel, port expander
- PCMCIA type II slot
- Rechargeable NiMH battery
- Supplied with Dos 6.2 and Windows 3.1
- 3 year Compaq warranty

Contura Aero 4/25M 170 ..... **£849**  
Contura Aero 4/33C 170 ..... **£1189**  
Contura Aero 4/33C 250 ..... **£1349**

### Compaq Contura 410



- 486dx2-50 processor
- 4 Mb RAM expandable to 20 Mb
- 170 Mb or 250 Mb hard disk
- internal 3.5" 1.44 Mb floppy drive
- Compact 79 key keyboard
- Integrated trackball
- Ports: Serial, parallel, mouse or keyboard and VGA monitor
- Two PCMCIA type II slots
- Rechargeable NiCAD or NiMH battery
- Supplied with Dos 6.2 and Windows 3.1
- 3 year Compaq warranty with 1st year onsite

| Model           | HD               | Display |       |
|-----------------|------------------|---------|-------|
| Contura 410     | 250Mb mono STN   |         | £1289 |
| Contura 410C    | 350Mb colour STN |         | £1719 |
| Contura 410CX   | 250Mb colour TFT |         | £2239 |
| 4Mb RAM upgrade |                  |         | £165  |

 **01705 66 41 44**

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# PRINTERS

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## Dot Matrix

### EPSON

|                    |      |
|--------------------|------|
| LX300              | £88  |
| LX1050             | £172 |
| FX870              | £221 |
| FX1170             | £279 |
| LQ100              | £96  |
| LQ300 <i>New !</i> | £141 |
| LQ570+             | £186 |
| LQ870              | £352 |
| LQ1070+            | £283 |
| LQ1170             | £401 |

### PANASONIC

|                 |      |
|-----------------|------|
| KX-P1150        | £89  |
| KX-P2023        | £108 |
| KX-P2135 Colour | £126 |
| KX-P2124        | £198 |
| KX-P3626        | £252 |



## Plotters

### CALCOMP

|                      |       |
|----------------------|-------|
| TechJet Colour A4-A0 | £4431 |
| DesignMate A4-A0     | £2007 |
| Digitising Tablet A4 | £216  |

### HEWLETT PACKARD



|                             |       |
|-----------------------------|-------|
| DesignJet 220 A4-A1 *       | £1445 |
| DesignJet 220 A4-A0 *       | £1902 |
| DesignJet 600 A4-A1 *       | £2716 |
| DesignJet 600 A4-A0 *       | £3246 |
| DesignJet 650C A4-A1 *      | £3711 |
| DesignJet 650C A4-A0 *      | £4386 |
| 3 Years On-site Maintenance | £295  |



## Cables

### PARALLEL TO PRINTER

|                           |     |
|---------------------------|-----|
| 1.8 M Printer Cable       | £2  |
| 1.8 M Bi-Centronics Cable | £4  |
| 3 M Printer Cable         | £6  |
| 5 M Printer Cable         | £10 |
| 10 M Printer Cable        | £15 |

### M - M CENTRONICS

|                         |     |
|-------------------------|-----|
| 2 Metre M-M             | £5  |
| 3 Metre M-M             | £8  |
| 5 Metre M-M             | £10 |
| 10 Metre M-M            | £15 |
| 2 Way Manual switch Box | £17 |



## Inkjet Printers

### CANON

|                      |      |
|----------------------|------|
| BJ200                | £177 |
| BJ200ex <i>New !</i> | £199 |
| BJ230                | £240 |



|                       |             |
|-----------------------|-------------|
| <b>BJC4000 Colour</b> | <b>£234</b> |
| BJC600                | £336        |
| BJ300                 | * £358      |
| BJ330                 | * £398      |
| BJC800                | * £1079     |
| BJC820                | * £1225     |

### EPSON



|                             |             |
|-----------------------------|-------------|
| <b>Stylus Colour 720dpi</b> | <b>£327</b> |
| Stylus Colour 720 dpi Paper | £Call       |
| Stylus 800+                 | £168        |
| Stylus 1000                 | £311        |

### HEWLETT PACKARD

|                                  |             |
|----------------------------------|-------------|
| DeskJet 320                      | £163        |
| DeskJet 320+SheetFeed            | £177        |
| DeskJet 320 Colour Kit           | £28         |
| DeskJet 320 Battery Pack         | £27         |
| DeskJet 520                      | £193        |
| <b>DeskJet 540 <i>New!</i></b>   | <b>£195</b> |
| DeskJet 560C                     | £305        |
| <b>DeskJet 850C <i>New!</i></b>  | <b>£391</b> |
| DeskJet 1200C                    | £626        |
| DeskJet 1200 PS                  | £992        |
| <b>DeskJet 1600C <i>New!</i></b> | <b>£835</b> |
| PaintJet XL300                   | £1594       |
| PaintJet XL300 Pscript           | £2562       |
| XL300 Ps 10Mb A3 Value Pack      | £2712       |

### HP for APPLE MAC

|                                   |             |
|-----------------------------------|-------------|
| DeskWriter 320                    | £169        |
| DeskWriter 320+SheetFeed          | £182        |
| <b>DeskWRITER 540 <i>New!</i></b> | <b>£197</b> |
| Deskwriter 560C                   | £337        |

No of \* = No of years On-Site Maint.



## Laser Printers

### BROTHER

|        |        |
|--------|--------|
| HL630  | £324   |
| HL631  | £365   |
| HL660  | £465   |
| HL1260 | * £919 |

### CANON

|          |        |
|----------|--------|
| LBP4i    | * £409 |
| LBP8 Mk4 | * £907 |

### EPSON

|                  |         |
|------------------|---------|
| EPL5200          | * £462  |
| EPL5600          | * £594  |
| EPL9000 12ppm A3 | * £1064 |

### HEWLETT PACKARD

|                                     |              |
|-------------------------------------|--------------|
| LaserJet 4L                         | £353         |
| <b>LaserJet 5P <i>New !</i></b>     | <b>£587</b>  |
| <b>LaserJet 5MP <i>New !</i></b>    | <b>£704</b>  |
| LaserJet 4+                         | £935         |
| LaserJet 4M+ Pscript                | £1258        |
| LaserJet 4V A3                      | £1368        |
| LaserJet 4MV Pscript A3             | £1972        |
| LaserJet 4Si                        | * £2054      |
| LaserJet 4Si MX                     | * £2927      |
| <b>LaserJet Colour <i>New !</i></b> | <b>£4199</b> |

### NEC



|                          |             |
|--------------------------|-------------|
| <b>Superscript 610</b> * | <b>£268</b> |
| SuperScript 610 Plus     | * £289      |
| SuperScript 660          | * £416      |
| SuperScript 660i         | * £569      |
| SuperScript Color 3000   | * £669      |

### PANASONIC

|                             |               |
|-----------------------------|---------------|
| <b>KX-P6100 <i>New!</i></b> | <b>* £275</b> |
| KX-P4400                    | * £278        |
| KX-P4401                    | * £289        |
| KX-P5400                    | * £524        |
| KX-P4430                    | ** £479       |
| KX-P4440                    | ** £698       |

### QMS Fast Adobe Postscript

|                         |       |
|-------------------------|-------|
| PS1060 A4 600x600 12Mb  | £1576 |
| PS1660 A3 1200x600 12Mb | £2891 |

### STAR

|              |      |
|--------------|------|
| Wintype 4000 | £288 |
|--------------|------|

No of \* = No of years On-Site Maint.



## Printer Ribbons

### AMSTRAD

|                   |            |          |
|-------------------|------------|----------|
| DMP2000/3000/3160 | 2+ RN 1.80 | 12+ 1.70 |
| PCW9512           | MS 2.30    | 1.99     |

### EPSON

|                       |         |      |
|-----------------------|---------|------|
| LQ100, LQ150 Original | DN 5.25 | 4.95 |
| LQ300/570/850/870     | DN 3.05 | 2.75 |
| LQ1070/1170           | DN 3.50 | 3.10 |
| LX300/400/850         | FN 2.85 | 2.55 |
| LX1050, FX1170        | FN 3.10 | 2.75 |

### PANASONIC

|                 |         |      |
|-----------------|---------|------|
| KXP1123/1124    | RD 2.30 | 2.20 |
| 2123/2124 BLACK | RD 3.95 | 3.70 |
| 2123/2124 COL   | RD 7.95 | 7.50 |

### STAR

|                    |         |      |
|--------------------|---------|------|
| LC10/100           | FN 1.60 | 1.40 |
| LC24-1/2/300, XB24 | DN 2.30 | 2.10 |



## Ink Cartridges

### CANON

|                    |             |
|--------------------|-------------|
|                    | 1+ 6+       |
| BJ10E, BJ20        | 14.75 13.95 |
| BJ200/BJ230        | 16.95 15.45 |
| BJ300/BJ330        | 13.00 12.00 |
| BJC600 Black       | 7.00 6.00   |
| BJC600 Colours     | 8.00 7.00   |
| BJC4000 BC21Black  | 8.00 7.00   |
| BJC4000 BC21Colour | 14.00 13.00 |
| BJC4000 BC20 Black | 23.00 21.00 |

### EPSON

|                            |       |       |
|----------------------------|-------|-------|
| Stylus 400, 800, 1000      | 10.00 | 9.00  |
| Stylus 800, 1000 Long Life | 19.00 | 17.00 |
| Stylus Colour Black        | 14.00 | 13.00 |
| Stylus Colour              | 35.00 | 33.00 |

### HEWLETT PACKARD

|                            |       |       |
|----------------------------|-------|-------|
| DeskJet 310, 320           | 16.75 | 15.95 |
| DeskJet 500, 520, 540, 560 | 19.75 | 18.95 |
| DeskJet Colour             | 21.00 | 19.00 |
| DeskJet 1200 Black         | 19.00 | 18.00 |



## Laser Toner

### HEWLETT PACKARD

|                        |       |       |
|------------------------|-------|-------|
| LaserJet IIP, IIIP     | 48.00 | 46.00 |
| LaserJet II, III, IIID | 49.00 | 47.00 |
| LaserJet 4L, 4ML, 4P   | 46.00 | 44.00 |
| LaserJet 4, 4M, 4+     | 71.00 | 69.00 |

### NEC

|                 |       |       |
|-----------------|-------|-------|
| SuperScript 610 | 78.00 | 76.00 |
|-----------------|-------|-------|

### STAR

|                    |       |       |
|--------------------|-------|-------|
| Laser 5 All Models | 67.00 | 65.00 |
| WinType 4000       | 68.00 | 62.00 |

**Free Carriage on all Consumables !**  
**Orders over £50 go Next Day**  
**We have Huge Range of Consumables**  
**Please Call if yours is not Listed**



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# PERIPHERALS

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## Monitors

### GOLDSTAR

|                              |      |
|------------------------------|------|
| GS1455D 14" 800x600          | £139 |
| GS1466DM 14" 1024x768 NI LR  | £177 |
| GS1505DM 15" 1024x768 NI LR  | £195 |
| GS1520DM 15" 1024x768 NI LR  | £248 |
| GS1727DM 17" 1024x768 NI LR  | £455 |
| GS1725DM 17" 1024x768 NI LR  | £480 |
| GS1730DM 17" 1280x1024 NI LR | £526 |

### NEC

#### Value Series

|                         |      |
|-------------------------|------|
| 2V 14" 1024x768 I LR    | £228 |
| XV15 15" 1024x768 NI LR | £279 |
| XV17 17" 1024x768 NI LR | £559 |

#### Efficiency Series

|                         |       |
|-------------------------|-------|
| XE15 15" 1024x768 NI LR | £389  |
| XE17 17" 1024x768 NI LR | £697  |
| XE21 21" 1152x870 NI LR | £1329 |

#### Professional Series

|                          |       |
|--------------------------|-------|
| XP17 17" 1152x870 NI LR  | £909  |
| XP21 21" 1360x1024 NI LR | £1749 |

### PHILIPS

|                               |      |
|-------------------------------|------|
| 14M 14" VGA Mono LR           | £89  |
| 14C 14" 1024x768 I LR         | £163 |
| 14B 14" 1024x768 NI LR        | £179 |
| 15B 15" 1024x768 NI LR Stereo | £254 |
| 17C 17" 1024x768 NI LR Stereo | £423 |
| 17A 17" 1280x1024 NI LR       | £643 |
| 17A 17" 1280x1024 NI LR       | £643 |
| 20C 20" 1280x1024 NI LR       | £779 |

### SONY

|                           |       |
|---------------------------|-------|
| CPD-15SF1 1024x768 NI LR  | £287  |
| CPD-17SF1 1024x768 NI LR  | £559  |
| GDM 17SE1 1280x1024 NI LR | £827  |
| GDM 20SE1 1280x1024 NI LR | £1419 |

### TAXAN

|                             |      |
|-----------------------------|------|
| 410 LR 14" 1024x768 NI LR   | £185 |
| 580 LR 15" 1024x768 NI LR   | £282 |
| 880 LR 17" 1280x1024 NI LR  | £509 |
| 885 LR 17" 1600x1200 NI LR  | £624 |
| 895 LR 17" 1600x1200 NI LR  | £834 |
| 1080 LR 20" 1600x1200 NI LR | £909 |



## Keyboards

|                         |     |
|-------------------------|-----|
| Silitek 102 Key Tactile | £17 |
|-------------------------|-----|



MS Natural Keyboard £59



## Scanners

### CANON

|                                 |      |
|---------------------------------|------|
| Ion PC Camera RC260 Kit         | £359 |
| IX-4015 Colour + SCSI Interface | £529 |

### EPSON Colour Scanners



#### SCANNER PACKAGES

Both packages Includes Scanner with all interfaces, cables & software required +

#### GTX includes:

|                                   |      |
|-----------------------------------|------|
| ● Adobe Photoshop LE              |      |
| ● Omni Page Direct OCR            |      |
| ● Page Keeper SE Document Manager |      |
| GTX6500 Parallel                  | £435 |
| GTX6500 SCSI                      | £496 |
| GTX8000 Parallel                  | £548 |
| GTX8000 SCSI                      | £609 |
| GTX9000 SCSI                      | £851 |

#### GTI package includes:

|                                |       |
|--------------------------------|-------|
| ● Adobe Photoshop full version |       |
| GTI6500 SCSI                   | £641  |
| GTI8000 SCSI                   | £753  |
| GTI9000 SCSI                   | £1004 |

### HEWLETT PACKARD

|               |      |
|---------------|------|
| ScanJet 3P PC | £338 |
| ScanJet IIcx  | £674 |

Please specify Interface - PC, MCA, or MAC

### LOGITECH

|                          |      |
|--------------------------|------|
| ScanMan 32 for Dos + OCR | £56  |
| ScanMan 32 for Wind OCR  | £56  |
| ScanMan 256 PC           | £78  |
| ScanMan EasyTouch        | £106 |



ScanMan COLOUR £169  
PowerPage £299

### PLUSTEK

|                                  |      |
|----------------------------------|------|
| ScanPlus 6000 Colour <b>New!</b> | £179 |
|----------------------------------|------|

A4 Sheet fed Includes Pict Pub LE + WordScan OCR



## Tape Streamers

### COLORADO

|                        |      |
|------------------------|------|
| DJ-20 250Mb Internal   | £93  |
| DJ-35 350Mb Internal   | £104 |
| DJ-25 700Mb Internal   | £169 |
| FC-20 Tape Controller  | £48  |
| Trakker 250Mb External | £188 |
| Trakker 350Mb External | £217 |
| Trakker 700Mb External | £304 |
| 250 Mb Tapes           | £12  |
| 350 Mb Tapes           | £18  |
| 700 Mb Tapes           | £22  |

Please Call for Quantity Tape Prices



## Mice

### LOGITECH

|                            |     |
|----------------------------|-----|
| Pilot Serial Mouse         | £17 |
| Mouseman Serial (Rht Hand) | £33 |
| Mouseman Cordless          | £49 |
| Trackman II                | £43 |
| Trackman Portable          | £35 |

### MICROSOFT

|                                    |     |
|------------------------------------|-----|
| Mouse 2 Serial & PS/2 Intellipoint | £35 |
| Home Mouse                         | £29 |



## Joysticks

### CH

|                    |     |
|--------------------|-----|
| Flight Stick       | £27 |
| Flight Stick Pro   | £49 |
| Virtual Pilot Yoke | £63 |

|                          |     |
|--------------------------|-----|
| Multi I/O with Game Port | £14 |
|--------------------------|-----|



## Faxes

### SAMSUNG

|                    |   |      |
|--------------------|---|------|
| SF40               | * | £177 |
| SF500              | * | £188 |
| SF800              | * | £246 |
| SF1505             | * | £247 |
| SF2800 <b>New!</b> | * | £292 |

### HEWLETT PACKARD



|                       |      |
|-----------------------|------|
| FAX 900               | £526 |
| FAX 950               | £678 |
| 3Yrs On-Site Warranty | £70  |



## Modems

### PACE



|                         |      |
|-------------------------|------|
| Mobifax 32+ 14.4 + Fax  | £92  |
| Linnet 34 V.Fast        | £271 |
| Microlin FX32+ External | £147 |
| Microlin FX32+ Internal | £134 |
| Microlin FX32+ PCMCIA   | £189 |

### US ROBOTICS



|                             |      |
|-----------------------------|------|
| Sportster 28.8+fax          | £189 |
| Sportster 14.4+fax          | £125 |
| Sportster 14.4+fax Internal | £126 |
| Worldport 14.4 +CellPhone   | £168 |
| Worldport PCMCIA 2496+fax   | £129 |
| Worldport PCMCIA 14.4 +Cell | £194 |
| Courier v34 External        | £262 |
| Courier v34 Internal        | £298 |

|             |    |
|-------------|----|
| Modem Cable | £9 |
|-------------|----|

APPROVED connection to telecommunications services specified in the instructions subject to the conditions set in them

Please add 17.5% VAT to all prices  
Next Day delivery £10



See Over for Order Details

# Next Day\*



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# SOFTWARE

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## Accounts

Microsoft Money 3 £25



Quicken Deluxe Home Pack £46  
Quicken Deluxe Business Pack £46  
Quicken for Windows 4.0 **New!** £29  
Quicken for DOS £33  
Quick Books v 2.0 £86

## SAGE STERLING for DOS

Book Keeper £56  
Accountant £160  
Accountant Plus £242  
Financial Controller £319  
Financial Controller LAN £506  
Payroll II £129

## STERLING + 2 for Windows



Book Keeper +2 £79  
Accountant +2 £190  
Accountant Plus +2 £272  
Financial Controller + 2 £354  
Financial Controller + 2 LAN £549  
Payroll for Windows £129  
Instant Accounting for Windows £79  
Instant Payroll for Windows £69



## Databases

Lotus Approach r3 £82  
DataEase 5.0 Dos £372  
DataEase 5.0 Windows £372  
DataEase 4.53 LAN 3 User £449  
dBase 5 Windows £228  
dBase 5 Windows Version Upg £89  
dBase 5 Dos £298  
dBase 5 Dos Ver Upg £89  
MS Access v2.0 £218  
MS Access v2.0 CCP Upgrade £78  
MS Foxpro v2.6 Std. Dos or Win £72  
MS Foxpro v2.6 Prof. Dos or Win £276  
Paradox v5 for Win Upgrade £117



## Edutainment

### DORLING KINDERSLEY

My First Amazing Dictionary £27  
The Way Things Work £41  
Ultimate Human Body £41  
Eyewitness Science Encyclopedia £41

### MICROSOFT

Ancient Lands £29  
Art Gallery £29  
Bookshelf £61  
Cinematica 1995 £29  
Dangerous Creatures £29  
Dinosaurs £29



### Encarta 1995 £56

Musical Instruments £29  
Magic School Bus - Human Body £29  
Magic School Bus - Solar System £29  
Gahan's Ultimate Haunted House £29



## Graphics

Adobe Illustrator v4 £345  
Adobe Photoshop v3.0 £398  
Aldus Page Maker Classic £44  
Aldus Page Maker 5 £389  
Aldus Photostyle v1.1 £386



Corel Draw 3 CD Only £45  
Corel Draw 4 CD Only £86  
Corel Draw 5 CD Only £287  
Corel Draw 3 - 5 Upg CD Only £208  
Corel Draw 4 - 5 Upg CD Only £116  
Corel Ventura 5 CD Only **New!** £195  
Corel Ventura 5 Upgrade CD Only £66  
Corel Gallery £26  
Corel Flow £46  
Microsoft Publisher 2 £63  
MS Creative Artist £29  
Quark Express v3.3 £554  
Serif PagePlus 3 £43  
Visio 3 £86  
Visio 3 Upgrade £59



## Integrated

Claris Works & Quicken windows £59  
Lotus SmartSuite 3.0 £315  
Lotus SmartSuite 3.0 Ver Upg £158  
Lotus SmartSuite 3.0 Comp Upg £243



### Microsoft Office 4.2 £319

MS Office 4.2 CCP Upgrade £151  
MS Office v4.2 Trade In £230  
MS Office Professional v 4.3 £423  
MS Office Prof v4.3 CCP Upgrade £227  
MS Office Prof v4.3 TradeIn £267  
MS Works 3 for Dos £83  
MS Works for Windows v3 £82  
Perfect Office 3.0 £145  
Perfect Office 3.0 Version Upg £119



## Languages

Borland Delphi **New!** £187  
Borland Turbo C++ v3 Dos £45  
Borland Turbo C++ v3 Windows £64  
Borland Pascal v7 Dos £64  
Borland Pascal for Windows £78  
CA Visual Objects **New!** £429  
MS Visual C++ Standard £53  
MS Visual C++ Pro CD for Win NT £249  
MS Visual Basic Standard £78  
MS Visual Basic Pro £193



## Netware

Novell Personal Netware £44  
Novell Netware v3.12 5 User £415  
Novell Netware v3.12 10 User £946  
Novell Netware v3.12 25 User £1398  
Novell Netware v4.1 5 User CD £415  
Novell Netware v4.1 10 User CD £946  
Novell Netware v4.1 25 User CD £1398  
Novell Netware v4.1 50 User CD £1898

See Next Page for Great Prices on  
3Com Network Cards



## Systems

MS DOS 6.2 Upgrade £37  
Microsoft Windows 3.1 £64  
MS WorkGroups for Windows 3.11 £91  
MS WFWG 3.11 Add On £43  
Novell Personal Netware £44  
OS/2 WARP 3.5\* £56  
OS/2 WARP CD £46



## Spreadsheet

Microsoft Excel 5 £219  
Microsoft Excel 5 CCP Upgrade £78  
Lotus 123 for Windows 5 £219

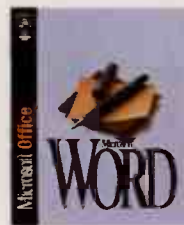


### SuperCalc for Windows £39



## WP

Lotus Ami Pro v3.1 £85  
Locoscript Pro 2 £62  
MS Creative Writer £29



### Word for Windows 6 £221

Word for Windows 6 CCP Upg £78  
WordPerfect for Windows 6.1 £165  
WP Windows 6.1 Version Upg £62  
WP Windows 6.1 CompetitiveUpg £79



## Utilities

Borland Sidekick + Dashboard £37  
Caere PageKeeper 2 **New!** £72  
Central Point PC Tools Win v2 £47  
Dr Solomons Anti Virus Dos £58  
Dr Solomons Anti Virus Windows £70  
Delrina WinComm Pro £55  
Delrina Winfax Pro v4 £53  
Delrina Winfax Pro v4 Upgrade £33  
Landmark WinProbe £45  
Laplink Pro v 5 Dos £59  
Laplink Pro v 5 Windows £84  
Lotus Organiser v2 £79  
Norton Utilities v8 £87  
PC Anywhere v5 DOS (host+Rem) £87  
PC Anywhere Windows £89  
Procomm Plus Windows £55  
QuarterDeck CleanSweep £27  
QuarterDeck Qemv v7.5 £45  
Stacker 4.0 £59  
Stacker 4.0 Upgrade £36  
Xerox Textbridge OCR £66

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# COMPONENTS

at

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## Hard Drives

### CONNER IDE

|         |       |      |      |
|---------|-------|------|------|
| CFS420A | 420Mb | 14ms | £113 |
| CFA540A | 540Mb | 12ms | £123 |

### QUANTUM IDE

|       |       |      |      |
|-------|-------|------|------|
| 540AT | 540Mb | 10ms | £132 |
|-------|-------|------|------|

### SEAGATE IDE



|         |       |      |      |
|---------|-------|------|------|
| ST3491A | 428Mb | 12ms | £112 |
| ST3660A | 545Mb | 12ms | £129 |

### WESTERN DIGITAL IDE

|           |       |      |      |
|-----------|-------|------|------|
| AC-2420   | 420Mb | 13ms | £117 |
| AC-2540   | 540Mb | 12ms | £147 |
| AC-2700A  | 730Mb | 10ms | £162 |
| AC-31000A | 1Gb   | 10ms | £249 |



## Interface Cards

### CONTROLLER CARDS

|                                 |     |
|---------------------------------|-----|
| IDE 2Hdd 2Fdd 1Parr 2 Ser 1Game | £14 |
| VL IDE Cache 1P/1G/2 16550 Ser  | £69 |

#### Promise

|                                 |      |
|---------------------------------|------|
| DC2300 VL IDE 1P/1G/2 16550 Ser | £39  |
| DC200 ISA IDE Cache             | £69  |
| DC4030 VL IDE Cache             | £79  |
| DC5030 PCI IDE Cache            | £105 |

### ADAPTEC SCSI Controllers

|                           |      |
|---------------------------|------|
| 1522 Hdd/Fdd              | £95  |
| 1542C kit ISA Hdd/Fdd     | £179 |
| 2742kit EISA Hdd/Fdd      | £259 |
| 2842kit VL Bus Hdd/Fdd    | £172 |
| 2940kit PCI Hdd           | £194 |
| T460kit PCMCIA fast SCSI2 | £179 |



## Other Drives

|                        |     |
|------------------------|-----|
| 5.25" 1.2Mb            | £39 |
| 3.5" 1.44Mb            | £32 |
| DUAL FLOPPY 5.25"+3.5" | £98 |



## Memory

|                  |      |
|------------------|------|
| 1Mb 70ns 30 Pin  | £27  |
| 4Mb 70ns 30 Pin  | £115 |
| 4Mb 70ns 72 Pin  | £118 |
| 8Mb 70ns 72 Pin  | £229 |
| 16Mb 70ns 72 Pin | £379 |
| 32Mb 70ns 72 Pin | £829 |



## Soundcards

### CREATIVE LABS

|                         |     |
|-------------------------|-----|
| Sound Blaster v2        | £32 |
| Sound Blaster Pro Value | £51 |
| Sound Blaster16 Value   | £64 |



|                            |      |
|----------------------------|------|
| Sound Blaster 16 MCD       | £89  |
| Sound Blaster 16 SCSI      | £112 |
| Sound Blaster 16 MCD AdSP  | £109 |
| Sound Blaster 16 SCSI AdSP | £132 |
| Sound Blaster AWE32        | £168 |
| Zi-Fi Speakers             | £25  |
| Zi-Fi Pro Speakers         | £39  |

### ORCHID

|                          |      |
|--------------------------|------|
| GameWave 32 inc Speakers | £69  |
| SoundWave 32 Pro         | £131 |
| SoundWave 32 Pro SCSI 2  | £143 |



## Graphics Cards

### CLICK

|                            |     |
|----------------------------|-----|
| Cirrus 5422 16.7m Colour   | £49 |
| Cirrus 5428 16.7m VLBus    | £59 |
| Tseng ET4000 1Mb ISA       | £59 |
| Tseng ET4000/W32 2Mb VLBus | £98 |

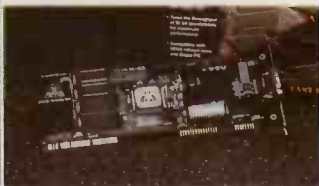
### DIAMOND

|                     |      |
|---------------------|------|
| Stealth 64 1Mb Dram | £104 |
| Stealth 64 2Mb Dram | £144 |

Please specify ISA, VLB, or PCI when ordering

### ORCHID

|                           |      |
|---------------------------|------|
| Fahrenheit VA ISA         | £99  |
| Fahrenheit 64 1Mb         | £114 |
| Fahrenheit 64 2Mb         | £155 |
| Fahrenheit Pro 64 2Mb VLB | £235 |
| Fahrenheit Pro 64 4Mb VLB | £349 |



|                   |      |
|-------------------|------|
| Kelvin EZ VLB 1Mb | £98  |
| Kelvin EZ PCI 1Mb | £98  |
| Kelvin 64 1Mb     | £98  |
| Kelvin 64 2Mb     | £129 |

Please specify ISA, VLB, or PCI when ordering



## CD Kits

### CREATIVE LABS

|                                   |      |
|-----------------------------------|------|
| Sound Blaster16 Cracker Pack      | £165 |
| 16 Bit Stereo Sound Card          |      |
| Panasonic CR563 Dual Speed CD Rom |      |
| Aldus Photostylar SE              |      |
| Grolier Encyclopaedia             |      |
| Battery Powered Speakers          |      |

|                                |      |
|--------------------------------|------|
| SoundBlaster CD16 Discovery    | £222 |
| SoundBlaster MultiMedia Office | £399 |



## CD Drives

### CREATIVE LABS

|                                     |     |
|-------------------------------------|-----|
| 563 MultiMedia Upgrade              | £92 |
| Includes Grolier Ency + PhotoStylar |     |

### NEC

|     |      |
|-----|------|
| 3Xi | £216 |
|-----|------|



### 3Xp Plus

|                            |      |
|----------------------------|------|
| 3Xe                        | £247 |
| 4Xi New !                  | £306 |
| 4Xe New !                  | £226 |
| 4XPro                      | £367 |
| AT Bus SCSI Interface      | £505 |
| MCA Bus SCSI Interface     | £43  |
| Parallel to SCSI Interface | £79  |
|                            | £95  |

### PANASONIC Multi-SessionCD

|                          |     |
|--------------------------|-----|
| CR562 Bare Drive         | £79 |
| Interface Kit inc Cables | £8  |

### TOSHIBA

|                             |      |
|-----------------------------|------|
| XM5201B Bare Internal Drive | £147 |
| XM3601B int Quad speed      | £215 |
| XM3501B int Quad speed      | £264 |

### PIONEER

|                           |      |
|---------------------------|------|
| DRU - 104X Quad Speed     | £179 |
| DRM-602X 6CD Double Speed | £487 |



## Network cards

### 3COM Etherlink III3C509B

| Connection | Bus | 1 Pack | 5 Pack |
|------------|-----|--------|--------|
| BNC        | ISA | £66    | £293   |
| RJ45       | ISA | £65    | £276   |
| BNC & RJ45 | ISA | £75    | £325   |

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# Next Day\*



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# Drives Plus...

\*See below

## SCSI

### Controller cards

|                |             |       |      |
|----------------|-------------|-------|------|
| DTC3280        | Kit         | 16bit | £99  |
| Adaptec 1510   | Kit         | 16bit | £59  |
| Adaptec 1515   | Kit         | 16bit | £69  |
| Adaptec 1542   | Kit         | 16bit | £175 |
| Adaptec 1542+  | Kit         | 16bit | £215 |
| Adaptec 2842VL | Kit         | VESA  | £199 |
| Adaptec 1640   | Kit         | MCA   | £225 |
| Adaptec 2742   | Kit         | EISA  | £275 |
| Adaptec 2940   | Kit         | PCI   | £225 |
| SP360VL        |             | VESA  | £129 |
| SP382VL        | 128k buffer | VESA  | £179 |
| SP296          | Cache       | EISA  | £279 |
| MCS700DNK      | PS/2 MCA    |       | £69  |



### SMC INFO GUIDE

The SCSI interface is necessary for very large drives or certain multi-user operating systems. SCSI is ideal for controlling multiple devices such as hard drives, CD-ROMS, tape drives and optical drives from one controller card as you can mix up to seven different drives from various manufacturers.

Please note: Active terminators are recommended for SCSI-2 and Wide SCSI devices and essential for Fast SCSI devices.

### Cables

|                             |     |
|-----------------------------|-----|
| Single drive internal       | £8  |
| Dual drive internal         | £10 |
| Triple drive internal       | £15 |
| Centronic 50 - Centronic 50 | £18 |
| Centronic 50 - 25 pin       | £18 |
| Centronic 50 - Micro D 50   | £35 |
| Micro D 50 - Micro D 50     | £38 |

### Terminators

|          |     |
|----------|-----|
| External |     |
| Active   | £25 |
| Passive  | £10 |

### Corel software

|                 |      |
|-----------------|------|
| Version 2       | £67  |
| Network manager | £285 |

### Floptical Drives

|                   |      |
|-------------------|------|
| Iomega Drive      | £195 |
| Kit               | £259 |
| Parallel port kit | £399 |

These 21Mb optical-based drives are ideal for storing large graphics or database files for quick and easy access. Having both read and write compatibility with standard 1.44Mb floppy disks they can replace your existing floppy drive.

### Floppy Disk Drives

|   |            |     |
|---|------------|-----|
| 3.5"  | 1.44Mb     | £29 |
| 5.25"   | 1.2Mb      | £39 |
| 3.5" / 5.25"  | Dual       | £89 |
| Single drive cable                                  | 5.25"      | £8  |
| Dual drive cable                                    | 3.5"/5.25" | £10 |
| Bracket and fascia - fits 3.5" drive into 5.25" bay |            | £8  |



### External Drive Boxes

- Prices from £85 - Phone us for advice and pricing
- For 1 to 4 SCSI devices
- Choice of open or closed front panels
- Suitable for:
  - Hard drives
  - DAT drives
  - Tape drives
  - Floptical drives
  - Optical drives
  - Syquest drives
  - CD ROM
- Available with Centronics 50 way, Wide SCSI and Micro D interfaces
- 3 year warranty
- UL / TUV / CSA approved
- Free fitting of any SCSI device when purchased at the same time

### SCSI hard disk drives

| Size   | Manufacturer | Model     | Access time | Cache / buffer | Fast SCSI-2 | Warranty | Price |
|--------|--------------|-----------|-------------|----------------|-------------|----------|-------|
| 270Mb  | Quantum      | MV270S    | 14ms        | 128k           | •           | 2yr      | £127  |
| 290Mb  | Maxtor       | 7290S     | 16ms        | 64k            | •           | 1yr      | £162  |
| 345Mb  | Seagate      | ST3390N   | 12ms        | 256k           | •           | 3yr      | £219  |
| 365Mb  | Quantum      | LT365S    | 12ms        | 128k           | •           | 2yr      | £129  |
| 400Mb  | HP           | C2235     |             |                |             |          | £199  |
| 528Mb  | Seagate      | ST5660N   | 12ms        | 256k           | •           | 3yr      | £219  |
| 532Mb  | Fujitsu      | M2684S    | 14ms        | 256k           | •           | 2yr      | £156  |
| 540Mb  | Conner       | CFA540S   | 12ms        | 256k           | •           | 1yr      | £233  |
| 540Mb  | Quantum      | MV540S    | 14ms        | 128k           | •           | 2yr      | £166  |
| 540Mb  | Quantum      | LT540S    | 11ms        | 128k           | •           | 2yr      | £175  |
| 730Mb  | Quantum      | LT730S    | 11ms        | 128k           | •           | 2yr      | £199  |
| 1.0Gb  | Conner       | CFP1060   | 9ms         | 512k           | •           | 1yr      | £425  |
| 1.0Gb  | Digital      | DSP3107   | 11ms        | 512k           | •           | 5yr      | £409  |
| 1.0Gb  | Fujitsu      | M2694ESA  | 10ms        | 256k           | •           | 5yr      | £379  |
| 1.0Gb  | HP           | C3323S    | 11ms        | 512k           | •           | 5yr      | £369  |
| 1.0Gb  | IBM          | Pegasus   | 9ms         | 512k           | •           | 5yr      | £359  |
| 1.0Gb  | Quantum      | LPS1080S  | 10ms        | 512k           | •           | 2yr      | £425  |
| 1.0Gb  | Seagate      | ST31230N  | 10ms        | 512k           | •           | 5yr      | £385  |
| 1.0Gb  | Seagate      | ST31250N  | 8ms         | 1Mb            | •           | 5yr      | £549  |
| 1.6Gb  | Digital      | DSP3160   | 12ms        | 512k           | •           | 5yr      | £569  |
| 1.6Gb  | Micropolis   | MIC2217   | 10ms        | 512k           | •           | 5yr      | £595  |
| 2.0Gb  | Fujitsu      | M2903S    | 11ms        | 512k           | •           | 5yr      | £815  |
| 2.0Gb  | Micropolis   | MIC4221   | 9ms         | 512k           | •           | 5yr      | £737  |
| 2.0Gb  | Fujitsu      | M2654SA   | 12ms        | 512k           | •           | 5yr      | £1085 |
| 2.0Gb  | IBM          | Alleycat  | 9ms         | 512k           | •           | 5yr      | £739  |
| 2.1Gb  | Digital      | DSP3210   | 10ms        | 1Mb            | •           | 5yr      | £829  |
| 2.1Gb  | HP           | C2490S    | 9ms         | 256k           | •           | 5yr      | £719  |
| 2.1Gb  | Quantum      | LPS2100   | 10ms        | 512k           | •           | 2yr      | £745  |
| 2.1Gb  | Seagate      | ST12400N  | 10ms        | 512k           | •           | 5yr      | £729  |
| 2.1Gb  | Seagate      | ST32430N  | 9ms         | 256k           | •           | 5yr      | £699  |
| 2.1Gb  | Seagate      | ST32550N  | 8ms         | 512k           | •           | 5yr      | £799  |
| 3.0Gb  | Fujitsu      | M2909S    | 11ms        | 512k           | •           | 5yr      | £1075 |
| 3.0Gb  | Micropolis   | MIC1936   | 13ms        | 256k           | •           | 5yr      | £1025 |
| 4.0Gb  | Digital      | DSP5400   | 11ms        | 1Mb            | •           | 5yr      | £1689 |
| 4.0Gb  | IBM          | Wildcat   | 9ms         | 512k           | •           | 5yr      | £1529 |
| 4.0Gb  | Seagate      | ST15230N  | 10ms        | 512k           | •           | 3yr      | £1344 |
| 4.0Gb  | Seagate      | ST15150N  | 10ms        | 512k           | •           | 5yr      | £1425 |
| 4.35Gb | Micropolis   | MIC3243   | 9ms         | 512k           | •           | 5yr      | £1272 |
| 9.0Gb  | Micropolis   | MIC1991   | 12ms        | 12ms           | •           | 3yr      | £2185 |
| 9.0Gb  | Seagate      | ST410800N | 9ms         | 1Mb            | •           | 5yr      | £2494 |

### Audio / Video drives

These high-performance drives are designed to give higher data transfer rates for multimedia applications. Ideal for animations, audio and MIDI recordings, digital video editing etc.

|       |            |           |       |      |   |     |       |
|-------|------------|-----------|-------|------|---|-----|-------|
| 2.1Gb | Micropolis | MIC4221AV | 8.5ms | 512k | • | 5yr | £828  |
| 4.3Gb | Micropolis | MIC3243AV | 8.5ms | 512k | • | 5yr | £1432 |
| 9.1Gb | Micropolis | MIC1991AV | 12ms  | 512k | • | 5yr | £2358 |

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Please ask our advice before ordering to avoid any foreseeable incompatibility problems.  
All trademarks acknowledged.

SMC Computers plc Terms & Conditions of Warranty available on request.



# Your **1st** choice for hard drives



## IDE

### Break your BIOS limitations

#### ADP60

The remarkable ADP60 card contains its own intelligent BIOS which allows IDE drives up to 512Mb to run on any PC - no more configuration worries!

If your PC does not have a 'user definable' option for hard disk drives then you need the ADP60. Available with or without floppy control, the card will fit into any ATISA bus on 286, 386 or 486-based systems.

ADP60 HDD £35  
ADP60F HDD/FDD £39

### Disk Manager



Ideal for 'branded' PC systems - such as those by Compaq, IBM, Amstrad etc - and other manufacturers

whose BIOS does not allow for large hard disk drives.

This easy to install software will initialise, partition and prepare virtually any hard disk drive. Disk Manager eliminates restrictions set by DOS and CMOS, allowing you to extend partitions beyond the parameters set by DOS and giving you complete storage access without the need for additional drivers.

#### DOS version

£29

When purchased with a hard drive

Other versions available are:

DOS £49  
Novell £249  
Macintosh £39

### IDE Upgrade Kits

Each kit contains all you need to upgrade to an IDE drive including:- Multi I/O controller, cable and 3.5" to 5.25" adaptor brackets.

ISA £30  
VESA £45

### Cables

Single drive £8  
Dual drive £10  
Note: Dual drive cables are 14" long with a space of 3.5" between connectors. Please check for compatibility with your system before ordering. We can custom make cables to order - please call with measurements.

### Controller Cards

C&C ISA Multi I/O £15  
C&C VESA Multi I/O £29  
Seagate ST08A ISA £25  
Promise DC-200 ISA cache £89  
Promise DC-4030 VESA cache £95

## 3.5" IDE hard disk drives

| Size  | Manufacturer    | Model    | Access time | Cache / buffer | E-IDE F-ATA | W'ranty | Price |
|-------|-----------------|----------|-------------|----------------|-------------|---------|-------|
| 245Mb | Maxtor          | 7273A    | 13ms        | 64k            | •           | 1yr     | £119  |
| 270Mb | Quantum         | MV270AT  | 14ms        | 128k           | •           | 2yr     | £112  |
| 320Mb | Maxtor          | 7345A    | 15ms        | 64k            | •           | 1yr     | £129  |
| 365Mb | Quantum         | LT365AT  | 11ms        | 128k           | •           | 2yr     | £122  |
| 420Mb | Conner          | CFS420A  | 13ms        | 32k            | •           | 1yr     | £122  |
| 425Mb | Western Digital | AC2420A  | 12ms        | 64k            | •           | 3yr     | £126  |
| 428Mb | Seagate         | ST3491A  | 15ms        | 120k           | •           | 3yr     | £117  |
| 532Mb | Fujitsu         | M2684T   | 14ms        | 256k           | •           | 2yr     | £137  |
| 540Mb | Conner          | CFS540A  | 15ms        | 256k           | •           | 1yr     | £133  |
| 540Mb | Western Digital | AC2540A  | 12ms        | 128k           | •           | 3yr     | £157  |
| 540Mb | Quantum         | MV540AT  | 14ms        | 128k           | •           | 2yr     | £137  |
| 540Mb | Quantum         | LT540AT  | 10ms        | 128k           | •           | 2yr     | £155  |
| 545Mb | Seagate         | ST3660A  | 14ms        | 120k           | •           | 3yr     | £138  |
| 540Mb | Maxtor          | 7540A    | 12ms        | 256k           | •           | 1yr     | £158  |
| 725Mb | Seagate         | ST3780A  | 12ms        | 256k           | •           | 3yr     | £207  |
| 730Mb | Quantum         | LT730AT  | 11ms        | 128k           | •           | 2yr     | £177  |
| 730Mb | Western Digital | AC2700A  | 10ms        | 128k           | •           | 3yr     | £181  |
| 850Mb | Western Digital | AC2850A  | 12ms        | 128k           | •           | 3yr     | £189  |
| 850Mb | Seagate         | ST5850A  | 11ms        | 256k           | •           | 3yr     | £225  |
| 850Mb | Maxtor          | 7850A    | 12ms        | 64k            | •           | 2yr     | £245  |
| 850Mb | Conner          | CFA850A  | 12ms        | 256k           | •           | 1yr     | £259  |
| 1.0Gb | IBM             | 84G8998  | 11ms        | 512k           | •           | 3yr     | £329  |
| 1.0Gb | Maxtor          | 71050A   | 12ms        | 256k           | •           | 1yr     | £343  |
| 1.0Gb | Seagate         | ST31220A | 12ms        | 256k           | •           | 3yr     | £299  |
| 1.0Gb | Western Digital | AC31200A | 10ms        | 128k           | •           | 3yr     | £282  |
| 1.2Gb | Conner          | CFA1275A | 12ms        | 256k           | •           | 1yr     | £299  |
| 1.2Gb | Western Digital | AC31000A | 10ms        | 128k           | •           | 3yr     | £325  |
| 1.2Gb | Maxtor          | 71260A   | 12ms        | 256k           | •           | 2yr     | £359  |
| 1.6Gb | Micropolis      | MIC2217A | 10ms        | 512k           | •           | 5yr     | £595  |

## 2.5" IDE hard disk drives

|       |         |          |      |      |     |      |
|-------|---------|----------|------|------|-----|------|
| 127Mb | Seagate | ST9150AG | 16ms | 32k  | 3yr | £157 |
| 135Mb | Toshiba | MK1522FC | 15ms | 64k  | 1yr | £149 |
| 172Mb | Seagate | ST9190AG | 16ms | 128k | 3yr | £177 |
| 209Mb | Seagate | ST9240AG | 16ms | 64k  | 3yr | £209 |
| 262Mb | Seagate | ST9300AG | 16ms | 120k | 3yr | £225 |
| 262Mb | Toshiba | MK1724FC | 13ms | 128k | 1yr | £199 |
| 340Mb | Toshiba | MK1824FC | 12ms | 128k | 1yr | £242 |
| 341Mb | Seagate | ST9385AG | 16ms | 120k | 3yr | £252 |
| 455Mb | Seagate | ST9550AG | 16ms | 120k | 3yr | £377 |
| 520Mb | Seagate | ST9655AG | 10ms | 120k | 3yr | £414 |
| 532Mb | Toshiba | MK2526FC | 12ms | 128k | 1yr | £376 |



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# Drives Plus...

## DAT DRIVES



### Hewlett Packard

#### SMC INFO GUIDE

Digital Audio Tape (DAT) offers fast, high quality, secure backups to those with large data archiving needs. DAT drives are very compact making them ideal for sharing between several computers and their capacity will suit almost any network.

#### C1553A

##### Autoloader £1569

- Holds up to 6 tapes
- Up to 48Gb data storage
- Cartridge swap in under 15 seconds
- File access in average 90 seconds including tape swaps
- 10 character status display on front panel

Note: Termination not supplied with internal version. See SCSI hard disk drive page.

**For external versions of any HP DAT drive add £100**

#### HP external kits

These kits are direct JetStor equivalents and are supplied complete with Adaptec controller, backup software and all necessary cables and manuals.

|           |       |           |       |
|-----------|-------|-----------|-------|
| HP2000-1  | 2.0Gb | 1 user    | £999  |
| HP2000-25 | 2.0Gb | 25 user   | £1199 |
| HP5000-25 | 4.0Gb | 25 user   | £1339 |
| HP5000-UL | 4.0Gb | Unlimited | £1679 |
| HP6000-25 | 8.0Gb | 25 user   | £1559 |
| HP6000-UL | 8.0Gb | Unlimited | £1899 |

#### 35470A

£549

- 2Gb data storage capacity
- 183 Kb/s (max) transfer rate (11Mb per minute)
- Fastsearch feature finds any file in an average 30 seconds
- Supports both 60m and 90m cartridges

#### 35480A

£635

- Up to 8Gb data storage capacity
- Up to 732Kb/s (max) transfer rate (44Mb per minute)
- Can store 1Gb in under 30 mins
- Fastsearch feature finds any file in an average 30 seconds

#### C1533A

£755

- Up to 16Gb data storage capacity
- 1.5Mb/s (max) sustained transfer rate (90Mb per minute)
- 200,000 MTBF rating
- Files accessed in an average 40 seconds
- Fully compatible with all DDS, DDS-2 and DDS-DC format drives
- Can use 120m, 90m and 60m cartridges

Note: Termination not supplied with internal version. See page 4.

#### Jetstor drives

|        |       |      |
|--------|-------|------|
| JS2000 | 2.0Gb | £665 |
| JS5000 | 4.0Gb | £719 |
| JS6000 | 8.0Gb | £885 |

External options for above add: £100

#### Jetstor external kits

|           |               |       |
|-----------|---------------|-------|
| JS2000XK  | ARC Solo s/w  | £879  |
| JS5000XKD | ARC Serve DOS | £1645 |
| JS5000XKW | ARC Serve Win | £1829 |
| JS6000XKW | ARC Serve Win | £2199 |

### WangDAT

#### 3100

£629

- 2Gb capacity
- Built-in self-activated head cleaner
- 30 second file search time

#### 3200

£669

- Up to 8Gb capacity with compression
- Up to 732Kb/s data transfer rate
- Built-in self-activated head cleaner

External versions add £100



## OPTICAL DRIVES

### SMC INFO GUIDE

The development of re-writeable technology has provided us with a high-capacity, reusable media which can be used time and time again with no deterioration in the media itself. Ideal for large data archives requiring fast access and updating.

### Hewlett Packard

|         |       |         |       |  |
|---------|-------|---------|-------|--|
| C1716T  | 1.3Gb | Int     | £1575 | • Up to 1.6Mb/s reads and 0.8Mb/s writes         |
| C2550A  | 1.3Gb | Ext kit | £1719 | • 23.5ms average access time                     |
| OM 1300 | 1.3Gb | Media   | £95   | • Reads and writes to 630Mb and 1.3Gb cartridges |

3 year on-site warranty from Hewlett Packard available for these drives for just £290

- Standard SCSI interface
- Read and write buffering (read aheads, write re-ordering and immediate reporting)
- 80,000 (MTBF)
- External kit includes drive, HP case, terminator, 1.3Gb media cartridge and DOS/Mac software

### Fujitsu

#### M2511A

- Low profile
- Fixed optics
- 30ms access time
- Embedded SCSI-2 controller
- ISO-standard format
- Up to 4Mb/s transfer rate

#### M2512A

- Up to 2.1Mb/s transfer rate
- Reads and writes 128Mb and 230Mb disks
- 237Kb buffer memory
- ISO-standard format
- 3,600 RPM rotational speed

|         |       |       |      |         |       |       |      |
|---------|-------|-------|------|---------|-------|-------|------|
| M2511A  | 128Mb | Int   | £425 | M2512A  | 230Mb | Int   | £475 |
| M2511AX | 128Mb | Ext   | £525 | M2512AX | 230Mb | Ext   | £575 |
| LMD300  | 128Mb | Media | £22  | OM230   | 230Mb | Media | £35  |

### PANASONIC



- Up to 1.56Mb/s sustained transfer rate
- 45ms access time
- Compatible with DOS, Windows, Macintosh, OS/2 and Unix
- 80,000 hours MTBF (mean time before failure)
- Can use both standard WORM and phase change cartridges
- Automatic lens cleaning mechanism
- 512Kb memory buffer

|          |       |       |       |
|----------|-------|-------|-------|
| LF7304   | 1.5Gb | Int   | £1477 |
| LF7300B  | 1.5Gb | Ext   | £1539 |
| LMR1500A | 1.5Gb | Media | £99   |

### Tapes

|                 |           |     |
|-----------------|-----------|-----|
| DC2060*         | 60/120Mb  | £10 |
| DC2120*         | 120/250Mb | £10 |
| DC48M - QIC80   | 170/340Mb | £17 |
| DC68M - QIC3010 | 350/700Mb | £25 |
| DC6150          | 150Mb     | £14 |
| DC6250          | 250Mb     | £16 |
| DC6525          | 525Mb     | £18 |
| DC9100          | 1.0Gb     | £24 |
| PT25 media      | 1.2Gb     | £28 |
| PT50 media      | 2.0Gb     | £38 |
| DAT 4mm         | 90metre   | £12 |
| DAT 4mm         | 120metre  | £16 |

\*Available pre-formatted to QIC standard. Please add £4.

### Backup software

#### CHEYENNE

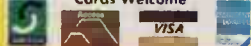
|                     | DOS  | Win   |
|---------------------|------|-------|
| ARCSolo Single user | £88  | £109  |
| ARC Serve 5 user    | £185 | £195  |
| 10 user             | £345 | £395  |
| 25 user             | £525 | £615  |
| 50 user             | £640 | £740  |
| 100 user            | £765 | £865  |
| 250 user            | £845 | £1065 |

ARCserve upgrades available. Please call for details.

### Fax orderline

01753 524443

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Access • Visa  
Switch • AmEx

The SMC Computers 30-day Quality Assurance Guarantee: If a product purchased from our component division should fail within 30 days, you have the option of an immediate exchange or a full refund (excluding carriage). Please note that this does not apply to software or PC Systems. If a non-faulty product is returned and a refund requested there will be a minimum 20% restocking fee.

E&OE: Prices and specifications subject to change without notice.  
Please ask our advice before ordering to avoid any foreseeable incompatibility problems.  
All trademarks acknowledged.

SMC Computers plc Terms & Conditions of Warranty available on request.



# Your **1st** choice for data backup

## TAPE DRIVES



### Colorado Jumbo

|                          |                  |                |
|--------------------------|------------------|----------------|
| <b>DJ20</b>              | <b>120/240Mb</b> | <b>£92</b>     |
| <b>DJ35</b>              | <b>170/340Mb</b> | <b>£109</b>    |
| <b>DJ25</b>              | <b>350/700Mb</b> | <b>£169</b>    |
| <b>External versions</b> |                  | <b>add £75</b> |

- All drives offer up to 6:1 compression with an average of 2:1
- Uses QIC format compatible tapes
- Internal versions can be attached to floppy controller - even with two floppy drives installed
- Dedicated controllers are available for top performance

### Jumbo accessories

|              |                              |             |
|--------------|------------------------------|-------------|
| <b>AB 11</b> | <b>External port</b>         | <b>£25</b>  |
| <b>FC-20</b> | <b>8bit controller</b>       | <b>£49</b>  |
| <b>TC-15</b> | <b>16bit controller</b>      | <b>£115</b> |
| <b>SK7</b>   | <b>Windows software</b>      | <b>£45</b>  |
| <b>SU53J</b> | <b>Unix / Xenix software</b> | <b>£79</b>  |
| <b>SK1</b>   | <b>Sytos Plus for OS/2</b>   | <b>£85</b>  |



### Wangtek

|                          |                 |
|--------------------------|-----------------|
| <b>5150PK kit</b>        | <b>£325</b>     |
| <b>5525ES</b>            | <b>£385</b>     |
| <b>51000ES</b>           | <b>£499</b>     |
| <b>External versions</b> | <b>add £100</b> |

- Wangtek's 5000 Series tape drives offer you leading price/performance in advanced quarter-inch tape drives. With capacities from 150 megabytes to 1 gigabyte, 5000 Series drives are an ideal match to a wide range of system data backup requirements.
- Uses QIC format compatible tapes
  - Quick-File-Access (QFA) feature for fast data retrieval
  - Compatible with most popular data backup software packages
  - PK kits are supplied with proprietary controller card, software, data cartridge and cable

## PARALLEL PORT DRIVES

### SMC INFO GUIDE

These compact, portable units connect to any standard parallel port making them ideal for notebooks and laptops with no or little expansion capabilities. The easy to install software can be loaded on to several systems allowing units to be transferred between systems. All these devices have a pass-through port to connect parallel printers.



### Colorado Trakker

|                           |             |
|---------------------------|-------------|
| <b>250Mb tape drive</b>   | <b>£188</b> |
| <b>350Mb tape drive</b>   | <b>£218</b> |
| <b>700Mb tape drive</b>   | <b>£275</b> |
| <b>Trakker carry case</b> | <b>£39</b>  |

- Conforms to QIC standards
- Supplied with DOS and Windows backup software
- Up to 8Mb/min backup speed



### Backpack CD ROM drive

**Quad speed £285**

- Up to 300kb/s transfer rate
- 190ms access time
- Dust proof mechanism
- Built-in audio circuit with headphone and line out sockets
- Motorised tray loading
- Photo CD compatible
- Weighs only 4lb



### Backpack tape drive

|              |             |
|--------------|-------------|
| <b>250Mb</b> | <b>£219</b> |
| <b>900Mb</b> | <b>£359</b> |

- Conforms to QIC standards
- Weighs only 5lb
- Macro recording for unattended backup
- Novell Netware compatible



### Backpack floppy drives

|                    |             |
|--------------------|-------------|
| <b>3.5" 1.44Mb</b> | <b>£119</b> |
| <b>3.5" 2.88Mb</b> | <b>£175</b> |
| <b>5.25" 1.2Mb</b> | <b>£125</b> |

- 1.44Mb model also accepts 720k disks
- 2.88Mb model also accepts 720k and 1.44Mb disks
- 1.2Mb model also accepts 360k disks
- Background formatting software included
- 32k data buffer

### Notes:

- 360Kb disks that have been written by a 1.2Mb drive may not be readable on a 360Kb drive.
- 2.88Mb format requires special extra density diskettes



### Backpack hard disk drives

|              |             |
|--------------|-------------|
| <b>210Mb</b> | <b>£282</b> |
| <b>420Mb</b> | <b>£332</b> |
| <b>850Mb</b> | <b>£499</b> |
| <b>1.2Gb</b> | <b>£566</b> |

- 14ms access time
- Security password option
- Automatic support for enhanced parallel ports (EPP)
- Up to 600kb/s transfer rate
- Switching power supply reduces heat and power consumption
- Weighs less than 3lbs
- Chains to any other Backpack product





# Drives Plus...

\*See below

## SOUND CARDS



### SoundBlaster AWE-32

#### Full pack

£163

- Built-in AdSP and EMU 8000 sound processors
- 1Mb ROM for MIDI samples and 512kb RAM for downloadable samples - upgradable to 28Mb
- 32-voice wave table built-in
- CD ROM interfaces for Panasonic, Mitsumi and Sony drives

#### Value pack

£123

- Upgrade port for AdSP chip
- 1Mb ROM for MIDI samples and 512kb RAM for downloadable samples
- 32-voice wave table built-in
- CD ROM interfaces for Panasonic, Mitsumi and Sony drives



### Orchid

#### SoundWave 32

£119

- Compatible with: SoundBlaster, Adlib, Windows SoundSystem, General MIDI, Roland MT 32
- Built-In Digital Signal Processor
- Over 100 digital recordings in wavetable ROM



### Gravis

#### Ultrasound

£99

- Stereo recording and playback
- 256k RAM upgradeable to 1Mb
- Real recorded sounds for wave table synthesis
- CD ROM interfaces for Sony, Mitsumi and LMSI drives



### Sound Producer Pro

£71

- Stereo recording and playback
- Speakers supplied
- 20-voice FM music synthesizer
- Built-in 4watt amplifier
- CD ROM interface for Panasonic drives



### SoundBlaster 16

#### Value pack

£59

#### MultiCD

£85

#### SCSI

£105

#### Multi CD/ASP

£111

#### SCSI/ASP

£125

- 16-bit stereo recording and playback
- MultiCD version supports: Panasonic, Mitsumi and Sony drives
- SCSI version supports up to seven SCSI-2 devices
- AdSP upgrade sockets on SCSI and MultiCD versions



### SoundBlaster Pro

#### Value pack

£44

#### With joystick

£52

- Stereo recording and playback
- 20-voice FM synthesizer
- CD ROM interface
- Programmable mixer
- Superb value multimedia card
- 2 FREE games



### SoundBlaster v:2

#### Card only

£28

#### With joystick

£35

- 'De facto' standard for hundreds of programs
- The best selling sound card in the world
- Ideal low cost games or business tool
- 2 FREE games

### WaveBlaster

£95

- Attaches to SoundBlaster 16 cards (not value)
- EMU wave table synthesis
- General MIDI compatible
- Ideal for music and sound effects

## MULTIMEDIA KITS



### GameBlaster CD

£215

#### Contains:

- SoundBlaster 16 sound card
- Creative CR563 CD ROM drive
- CT-38 speakers
- Joystick
- 6 CD ROM titles including 4-title CD and Rebel Assault
- Free Games
- Creative software

Perfect for the dedicated games player.

### CD16 Discovery

Int: £195

Ext: £295

#### Contains:

- SoundBlaster 16 sound card
- Creative CR563 CD ROM drive
- Microphone
- SBS30 Speakers
- 9 CD ROM titles including Grolier
- Creative software

Ideal general use internal multimedia kit with a superb mix of educational and entertainment CD ROM titles.



### SoundBlaster Office

£389

The ultimate upgrade for the home or small business office. We just don't have the space to list all the features. Please call for more information.

## MIDI

### MIDI Blaster

£95

- MTC32 MIDI compatible
- Can be used as a stand-alone device on PC or MIDI
- Plays up to 20 notes simultaneously
- Includes 9v adaptor, cable and software

### Cables

Connect your sound card to any MIDI keyboard or device. Our kit contains cables and software for recording and playback.

SoundBlaster MIDI cable set

£16

SoundBlaster MIDI kit

£49

MIDI Box for multiple devices

£37

## SPEAKERS

### Creative Labs

#### Pro Digital

£29

- 4 watt
- Mains powered
- Magnetically shielded to protect monitors
- Suitable for all popular audio cards

### Yamaha

#### M10

£59

- 10 watt per channel
- Magnetically shielded
- Active Servotechnology for bass response

### SS510 Sub-woofer

£129

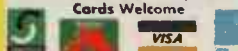
- 25 watts power
- 35Hz-250Khz frequency response  $\pm 3\text{dB}$
- Auto On/Off

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SMC Computers plc Terms & Conditions of Warranty available on request.



# Your **1st** choice for multimedia

## CD ROM DRIVES



### Toshiba

XM3601B Internal £245  
XM3601S External £32

- Up to 684Kb/s sustained data transfer rate
- 150ms access time
- 256Kb data buffer
- Sealed enclosure
- Front panel headphone socket and audio volume control
- Fully compatible with MPC2, Photo CD, CD ROM XA, CD-I etc



### Pioneer

DR-U104X £219

- 614Kb/s sustained transfer rate
- 4Mb/s burst transfer rate
- 190ms access time
- 256k cache
- Fully MPC2 compatible



### GoldStar R540B

£119

From one of the world's largest CD ROM drive manufacturers come one of the fastest IDE CD ROM drives. Fully compatible with all the latest multimedia formats, including Video CD, the R540B will run from any EIDE/ATA interface.

- 190ms access time
- Over 600Kb/s transfer rate
- 256Kb buffer memory
- Motorised tray
- 'Quick Audio Play' control buttons on front panel
- Headphone socket
- Long 100,000 hours MTBF
- Drivers supplied



### Orchid

CDS-3110 £99

- 300kb/s transfer rate
- 350ms access time
- Sleep circuit to maximise laser life and reduce power consumption
- Kit include interface card, cables and drivers



### Panasonic

CR 562 £83  
AT interface card £10

- 320ms access time
- 300Kb/s transfer rate
- Headphone socket with volume control
- Supports Photo CD, CD ROM XA, MPC2
- Embedded lens cleaning mechanism
- 64k buffer memory
- Interface card includes all necessary cables

### SoundBlaster

Omni CD ROM kit £119

- Includes
- CR 563 drive
  - Interface card
  - Free software

CD ROM upgrade kit £93

- Includes
- CR 563 drive
  - Free software

### Backpack CD ROM

Quad speed £295

- 190ms access time
- Connects to any standard parallel port
- Up to 300kb/s transfer rate
- Photo CD compatible
- Weighs only 4lbs



### Mitsumi FX400

£145

- Sub 250ms access time
- 600Kb/s transfer rate
- 256Kb cache
- Drivers for DOS/Windows, Windows NT, OS/2 Warp
- Compatible with most CD ROM standard including CDI-Movie
- Double dustproof system to protect lens
- Headphone socket with volume control
- IDE / EIDE standard interface

### NEC CDR-271

£129

- IDE / EIDE interface
- 250ms access time
- 600Kb/s transfer rate
- 256Kb cache
- Tray loading mechanism
- Fully MPC-2 compatible

## CD ROM SOFTWARE

### Special CD ROM bundle prices.

Because of the very low prices of these top-class CD titles, only SMC Customers who choose one of our large range of CD ROM drives may take advantage of this offer at the time of their purchase.

Don't pay more for your new CD software, call our sales team today and join the multimedia revolution tomorrow!

Here is a selection of the titles available. Please call for our full list.

|                       |     |
|-----------------------|-----|
| Kodak Access Photo CD | £15 |
| Grolier Encyclopaedia | £32 |
| Microsoft Encarta '95 | £52 |
| World Atlas           | £15 |
| Solar System          | £15 |
| Battlechess MPC       | £17 |
| Clipart Heaven        | £18 |
| Animals Encyclopaedia | £27 |
| 7th Guest             | £29 |

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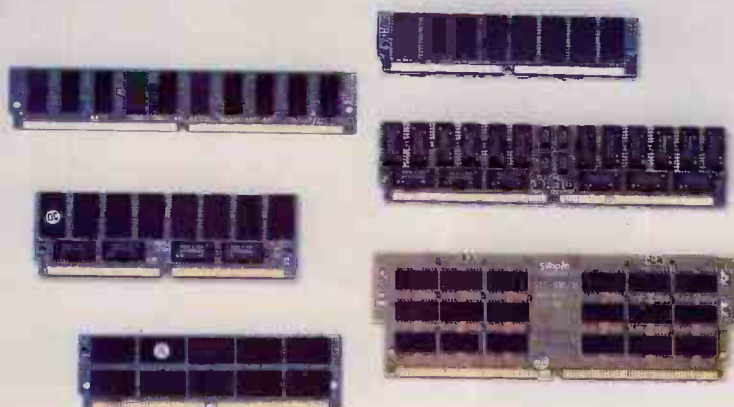




# Drives Plus...

\*See below

## MEMORY MODULES



### IBM

N33SX, L40SX notebook  
2Mb Module £99  
4Mb Module £175  
8Mb Module £330

PS/2 35SX, 35LX, 40SX  
2Mb Module £89  
4Mb Module £159  
8Mb Module £315

PS/2 50, 50Z, 55SX, 55LS, 60, 65SX  
1-16Mb Board £165  
2-16Mb Board £232  
4-16Mb Board £292  
2Mb Module £79  
4Mb Module £130

PS/2 P70 portable  
2Mb Module £79

PS/2 P75 portable  
2Mb Module £85  
4Mb Module £150

PS/2 90, 95  
2Mb Module £93  
4Mb Module £150  
8Mb Module £290

PS/ ValuePoint 6382, 6384, 6387  
2Mb Module £93  
4Mb Module £150  
8Mb Module £290

PS/1 286, 386, Pro  
2Mb Module £85  
4Mb Module £159

PS/1 486  
4Mb Module £156  
16Mb Module £596

Thinkpad 700, 720, 750  
2Mb Module £160  
4Mb Module £200  
8Mb Module £376  
16Mb Module £748

Thinkpad 350, 350C  
8Mb Module £375

### Toshiba

T1200XE  
2Mb Module £92

T1600  
2Mb Module £95

T1000LE, T1800, T1850, T2000, T2000SX, T2200SX  
4Mb Card £175  
8Mb Card £275

T3100e  
2Mb Kit £95

T3100SX  
2Mb Module £85  
4Mb Module £159

T3200  
3Mb Module £175

T3200SX  
4Mb Kit £170

T3200SXC  
4Mb Kit £168

T4400, T6400, T6600  
4Mb Module £169  
8Mb Module £318  
16Mb Module £620

T1900, T1950, T4500, T4600, T4700  
4Mb Card £195  
8Mb Card £375  
16Mb Card £755

T5100  
2Mb Module £99

T5200, T8500  
2Mb Kit £95  
8Mb Kit £330

All our memory modules are distributed by established manufacturers and are supplied with a minimum 5 year warranty

### Dell

NL20, NL25 notebook  
2Mb Module £105

320SX, 325, 333, 433, 486, D, P  
1Mb Module £55  
4Mb Module £139

420, 425, 433, 450DE, SE, TE, 466SE, DSA  
2Mb Kit £95  
4Mb Kit £169  
8Mb Kit £295  
16Mb Kit £592

Performance L, M, T series  
4Mb Module £139  
16Mb Module £495

Performance ME series  
8Mb Kit £310  
16Mb Kit £625  
32Mb Kit £1080

### Zenith

Z-386/20, 25, 33, 33e  
4Mb Module £135

Z-386SX, 386SX/20, 286LP+, 286LS  
2Mb Kit £75

SuperSport 286  
1Mb Module £62

SuperSport 286e, SlimSport 286  
1Mb Module £62  
2Mb Module £97  
4Mb Module £169

SuperSport SX  
2Mb Module £125  
2Mb Module A £125  
2Mb Module B £2065

MasterSport 286  
1Mb Module £75

MasterSport 386SX  
2Mb Module £94

MasterSport 386SL, SLe, SLC  
2Mb Module £92  
4Mb 2x2Mb Modules £184

### Compaq

LTE Lite 386S/20 notebook  
1Mb Module £75  
4Mb Module £185

LTE Lite 4/25C, 33C, 25E, 25SL notebook  
4Mb Card £179  
8Mb Card £349  
16Mb Card £769

SLT 386S/20  
1Mb Module £74  
2Mb Module £135  
4Mb Module £225

SLT 286  
1Mb Module £75  
4Mb Module £265

Deskpro 286/386N, 386S/20, 386S/20N  
1Mb Module £52  
2Mb Module £79  
4Mb Module £139

Deskpro 386S/16  
1Mb Board £135  
4Mb Board £230  
1Mb Module £69  
4Mb Module £189

Deskpro 286E, 386/20, 386/25  
1Mb Module £85  
4Mb Module £193

Deskpro 386/20, 25E  
1Mb Board £114  
4Mb Board £245  
1Mb Module £85  
4Mb Module £190

Deskpro 386/33  
2Mb Module £105

Deskpro 486/33L, 486/50L, 486/25  
2Mb Module £105  
8Mb Module £335  
32Mb Module £1440

Deskpro 486/33M  
1Mb Module £62  
2Mb Module £89  
4Mb Module £159  
8Mb Module £285

Deskpro XE, Li  
4Mb Module £167  
8Mb Module £325

Systempro 386/33, 486/33  
2Mb Module £105  
8Mb Module £335  
32Mb Module £1440

Prolinea 4/25S, 4/33, 4/33S, 4/50, 4/66, NET1, MT  
2Mb Module £79  
4Mb Module £139  
8Mb Module £265

Proliant 1000, 486DX2-66  
8Mb Module £325  
16Mb Module £585  
32Mb Module £1060

Proliant 1000 5/60, 2000, 4000  
16Mb Kit £550  
32Mb Kit £1090  
64Mb Kit £2065

Contura 4/25, 4/25C, 4/25CX  
4Mb Board £165  
8Mb Board £285  
16Mb Board £645

Concerto 4/25, 4/33  
4Mb Module £219  
8Mb Module £399  
16Mb Module £1199

### SMC INFO GUIDE

Our range of memory modules is designed to be 100% compatible with your system. They need no special adaptors other than those required by the manufacturer. Our sales team will be pleased to advise you should your upgrade require more than our module. Please call if you are unsure which module or board you require as we can quickly identify and recommend the right memory module for you.

### Printers

Brother HL-6, 6V  
2-4Mb Board £135  
4Mb Board £225

Brother HL-8D, 8e, 8V  
1-2Mb Board £98  
2Mb Board £148

HP DeskJet Plus, 500, 500C, 550C  
256k Cardtridge £59

HP LaserJet II/IIID  
2-4Mb Board £125  
4Mb Board £197

HP LaserJet IIP, IIP Plus, III, IIID, IIIP  
1-4Mb Board £69  
2-4Mb Board £105  
4Mb Board £182

HP LaserJet IIIsi, PaintJet XL300  
1Mb Module £57  
4Mb Module £140  
8Mb Module £280

HP PaintJet XL300  
4-16Mb Board £200  
8-16Mb Board £340

HP LaserJet 4, 4M, 4Si, 4SiMX, DeskJet 12200C, 1200 / PS  
1Mb Module £57  
2Mb Module £95  
4Mb Module £139  
8Mb Module £329

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2-4Mb Board £149  
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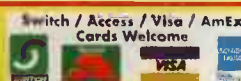
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### SMC INFO GUIDE



More and more software packages are demanding more and more memory to run at their optimum.

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| 4Mb x 9     | 30 pin | £133        | £128        |
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Memory modules and processor chips are sensitive to static electricity and can easily be damaged. When fitting memory ensure you have discharged any static by wearing an anti-static wrist strap (preferred) or by touching your PC case (providing it is connected to mains electricity but not switched on).

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| 486sx-33  | £59          | 486DX4-100  | requires fan | £329 |
| 486DX-33  | £109         | Pentium® 60 | requires fan | £299 |
| 486DX2-50 | requires fan | Pentium® 66 | requires fan | £359 |
| 486DX-50  | requires fan | Pentium® 90 | requires fan | £449 |

### Intel Overdrive Chips

|           |                 |      |
|-----------|-----------------|------|
| ODSX25CP  | SX-25 to DX2-50 | £109 |
| ODDX250SS | DX-25 to DX2-50 | £122 |
| ODDX250DS | DX-25 to DX2-50 | £122 |
| ODDX266SS | DX-33 to DX2-66 | £138 |
| ODDX266DS | DX-33 to DX2-66 | £138 |

Note: SS = Single Socket  
DS = Dual Socket

### CPU Heat sinks

|               |          |     |
|---------------|----------|-----|
| 486           | Standard | £9  |
| 486           | With fan | £15 |
| Pentium 60/66 | With fan | £22 |
| Pentium 90    | With fan | £25 |



## MOTHERBOARDS

### 486 Processor ready

#### VESA

- 256k cache
- 3 VESA, 4 ISA slots
- 30 and 72 pin SIMM sockets
- Maximum 128Mb RAM
- 3.3V
- DX4 compatible

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- 2 VESA, 5 EISA slots
- 30 and 72 pin SIMM sockets
- Maximum 128Mb

£69

#### VESA / PCI 60/66

£197

#### VESA / PCI 90

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#### EISA / VESA 66

£259

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Note: All 486 and Pentium processor motherboard prices exclude CPU. See above right for processors.

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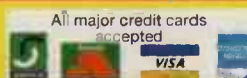
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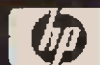
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| HP 35470 2.0GB EXT. KIT*   | -    | £679  |
| HP 35480 2.8GB             | £619 | £659  |
| HP 35480 2.8GB EXT. KIT*   | -    | £789  |
| HP C1533A 4-16GB           | £669 | £725  |
| HP C1533A 4-16GB EXT. KIT* | -    | £849  |
| HP JS2000 2.0GB            | £819 | £925  |
| HP JS5000 4.0GB            | £945 | £1085 |
| HP JS2000 EXT. KIT*        | -    | £1099 |
| HP JS5000 EXT. KIT*        | -    | £1299 |
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|-----------------|-------|-------|
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| HP C1716T 1.3GB | £1345 | £1445 |



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|                   |       |       |
|-------------------|-------|-------|
| HP DESIGNJET 220  | A4-A1 | £1496 |
| HP DESIGNJET 220  | A4-A0 | £1959 |
| HP DESIGNJET 600  | A4-A1 | £2805 |
| HP DESIGNJET 600  | A4-A0 | £3357 |
| HP DESIGNJET 650C | A4-A1 | £3843 |
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540 Mb HARD DISK  
PCI GRAPHICS CARD  
14" SVGA MONITOR

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## FUJITSU

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DiamondTron 21" Monitor

### IDEK

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MF-5221A 21" 1280x1280 FST

MF-8421 21" 1600x1280

MF-8621 21" 1600x1280 FST

### NOKIA

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447B090 17" Trinitron 1280x1024 60Hz

447M090 17" Trinitron 1280x1024 76Hz

447M092 17" Trinitron 1280x1024 60Hz

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445X092 21" TCO 1600x1200 80Hz

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20SE1 20" 1600x1200

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CDP 1730 £699

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| SCSI Seagate |          |       |
| HAWK 1       | 1.05GB   | £399  |
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| BARRACUDA    | 4.29GB   | £1609 |
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STORAGE!

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GT 6500+PicPub LE SCSI

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SCANTOUCH II AX-1200

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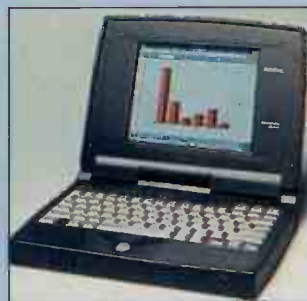
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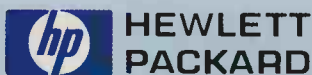
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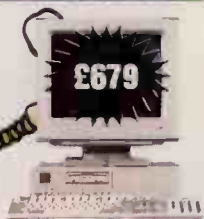
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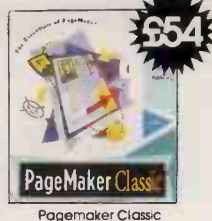
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All prices are subject to VAT (17.5%) and Delivery and may change without notice. Delivery charges: PC systems \$19. Laptops and large items \$15. Other items \$10. Goods are normally delivered within a few days of cleared payment. All orders will be fulfilled within 28 days unless otherwise notified. No surcharges are made to Access, Visa, Amex or Switch. Business user prices shown. End user enquiries welcome. Goods are not supplied on a trail basis. Credit account orders are normally 3% extra. Errors and omissions excepted.



PageMaker Classic

3.5" disk media unless specified

## ALDUS/ADOBE

|                             |       |
|-----------------------------|-------|
| Adobe Acrobat Pro           | \$388 |
| Adobe Type Manager v2.5 Win | \$64  |
| Adobe Illustrator Win       | \$397 |
| Adobe Photoshop Win         | \$466 |
| PageMaker v5 Win            | \$398 |
| PageMaker Classic Win       | \$54  |
| Aldus Persuasion Win        | \$198 |
| Aldus PC Collection Win     | \$829 |
| Aldus Intellidraw Win       | \$84  |
| Aldus PhotoStyler Win       | \$389 |

## ASYMETRIX

|                         |       |
|-------------------------|-------|
| Asymetrix Mediabltz Win | \$57  |
| Multimedia Toolkit      | \$429 |
| Toolbook                | \$224 |

## AUTODESK

|                           |       |
|---------------------------|-------|
| Autosketch for Windows    | \$149 |
| Generic CAD v6.1 DOS      | \$379 |
| Autodesk Animator Pro Win | \$278 |
| AutoCAD LT                | \$373 |



Asymetrix MediaBlitz

## BORLAND LANGUAGES

|                                  |       |
|----------------------------------|-------|
| Borland Base for Win v Upg       | \$119 |
| Borland Base for Win             | \$227 |
| Borland C++ v4.5 DOS & Win       | \$218 |
| Borland C++ v4.5 version Upgrade | \$93  |
| Borland C++v4.5 Compet Upgrade   | \$139 |
| Borland Turbo C++ for DOS v3     | \$45  |
| Borland Turbo C++ Win Visual Ed  | \$80  |
| Borland Turbo Pascal v7 for DOS  | \$66  |
| Borland Turbo Pascal Pro DOS     | \$137 |
| Borland Turbo Pascal for Win     | \$84  |
| dBase 5 DOS Upg                  | \$83  |
| dBase 5 DOS                      | \$324 |
| Borland Daphn                    | \$165 |

## APPLICATIONS

|                            |       |
|----------------------------|-------|
| Borland Sidekick           | \$25  |
| Quattro Pro v5 for DOS     | \$39  |
| Quattro Pro for Windows v5 | \$29  |
| Paradox v4.5 for DOS       | \$POA |
| Paradox V5 Win             | \$238 |
| Paradox v4.5 Comp Upg DOS  | \$139 |



Quattro Pro for Windows V5

|                              |       |
|------------------------------|-------|
| Paradox v4.5 Upg from v4 DOS | \$59  |
| Paradox v5 for Win Upg       | \$118 |

## CENTRAL POINT/SYMANTEC

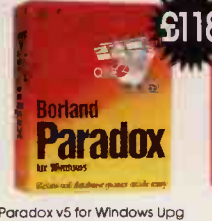
|                                |       |
|--------------------------------|-------|
| CP PC Tools Pro (v9) DOS       | \$74  |
| CP PC Tools for win v2         | \$63  |
| CP Xtree Gold v3               | \$62  |
| CP Xtree for Windows v2        | \$47  |
| Norton Antivirus + Subs v3 Win | \$77  |
| Norton Desktop v3 for Win      | \$88  |
| Norton PC Anywhere DOS         | \$85  |
| Norton PC Anywhere Win H&R     | \$93  |
| Norton PC Anywhere Win Host    | \$50  |
| Norton PC Anywhere Win Remote  | \$55  |
| Norton Utilities v8 DOS        | \$84  |
| ACT v2 for Windows             | \$135 |
| Symantec Q&A v4 for Win        | \$129 |
| Timeline for Win               | \$319 |
| On Target for Win              | \$79  |

## CLARIS

|                           |      |
|---------------------------|------|
| Claris Works & Quicken v3 | \$62 |
|---------------------------|------|

## COREL

|             |      |
|-------------|------|
| CorelDraw 3 | \$84 |
|-------------|------|



Paradox v5 for Windows Upg

|                      |       |
|----------------------|-------|
| 3.5" & CD            | CD    |
| CorelDraw 4          | \$265 |
| CorelDraw 5          | \$420 |
| CorelDraw 3 to 4 Upg | \$150 |
| CorelDraw 3 to 5 Upg | \$271 |
| CorelDraw 4 to 5     | \$150 |
| Corel Ventura V5     | \$259 |
| Corel Ventura v5 Upg | \$149 |
| Corel SCS v2         | \$66  |
| Corel CD Power       | \$25  |
| Corel Prof Photos CD | \$17  |
| Corel Art Show 5 CD  | \$20  |
| Corel Gallery        | \$27  |
| Corel Flow           | \$45  |

## COMPUTER ASSOCIATES

|                           |       |
|---------------------------|-------|
| CA Office DOS             | \$99  |
| Supercalc 5.5 DOS         | \$59  |
| CA AccPak Simply Accounts | \$29  |
| CA dBase                  | \$199 |
| CA Simply Business        | \$58  |
| CA Superproject for Win   | \$469 |
| CA SuperCalc for Windows  | \$68  |



IBM OS/2V3 + Lotus SmartSuite

## DELRINA

|                              |      |
|------------------------------|------|
| Delrina DOSFAX               | \$38 |
| Winfax Pro for Win           | \$53 |
| Winfax Pro Upgrade from Life | \$32 |
| Opus 'n Bill Screen Saver    | \$29 |

## GST

|                              |      |
|------------------------------|------|
| Timeworks v2 DOS             | \$29 |
| GST Pressworks for Windows   | \$49 |
| GST Designworks v2 Windows   | \$64 |
| GST Designworks & Pressworks | \$79 |

## IBM

|                             |       |
|-----------------------------|-------|
| IBM OS/2 v2.0               | \$28  |
| IBM OS/2 v2.1               | \$79  |
| IBM OS/2 v3 + Stacker 3-5"  | \$82  |
| IBM OS/2 v3 + Stacker CD    | \$69  |
| IBM OS/2 v2.1 + Wordperfect | \$219 |
| IBM PC DOS v7               | Call  |
| IBM OS/2 V3                 | \$51  |
| IBM OS/2V3 CD               | \$45  |
| IBM OS/2V3 + Stacker Upg    | \$54  |
| IBM OS/2V3 + Stacker CD     | \$45  |



dBASE v5 for Windows Upg



CA Simply Business



CA SuperCalc for Win



CorelDraw v4 CD



IBM OS2 V3



Symantec ACT v2



Norton Utilities v8



GST Designworks & Pressworks



WinFax Pro



Gemini V7.5

## IMSI

|                      |      |
|----------------------|------|
| TurboCAD v3.2 DOS    | \$56 |
| TurboCAD for Windows | \$69 |
| Format Gold          | \$47 |
| Windose              | \$15 |
| CD Speedway          | \$27 |
| Picture This         | \$47 |
| Space Missions CD    | \$27 |
| World War II CD      | \$27 |
| Masterclips CD       | \$61 |
| Masterclips          | \$83 |

## NEXBASE

|                           |       |
|---------------------------|-------|
| AutoRoute Exp UK DOS      | \$48  |
| AutoRoute Plus v7         | \$216 |
| AutoRoute Express for Win | \$73  |
| AutoRoute Plus for Win    | \$278 |
| Explorer                  | \$66  |

## MapBase

|         |       |
|---------|-------|
| MapBase | \$289 |
|---------|-------|

## QUICKEN

|                            |      |
|----------------------------|------|
| Quicken Deluxe Home V4     | \$46 |
| Quicken Deluxe Business V4 | \$46 |
| Quicken v6 for DOS         | \$35 |
| Quicken v4 Windows         | \$28 |
| QuickBooks v2              | \$86 |
| QuickTax '95               | \$28 |

## RODRICK MANHATTEN

|                               |      |
|-------------------------------|------|
| Org Plus Win                  | \$89 |
| Planix Win                    | \$89 |
| Family Tree Maker Win         | \$39 |
| Arts & Letters Apprentice Win | \$48 |

## SAGE STERLING

|                              |        |
|------------------------------|--------|
| Bookkeeper v7 DOS            | \$51   |
| Accountant v7 DOS            | \$159  |
| Accountant plus v7 DOS       | \$241  |
| Financial Controller v7 DOS  | \$318  |
| Payroll II DOS               | \$143  |
| Job Costing                  | \$106  |
| Moneywise Win                | \$37   |
| Bookkeeper Sterling+2 win    | \$78   |
| Accountant Sterling+2 win    | \$192  |
| Accountant Plus Ster.+2 win  | \$273  |
| Finan Controller Ster.+2 win | \$356  |
| Sage Total Business          | \$Call |

## SOFTKEY/WORDSTAR

|                     |       |
|---------------------|-------|
| Wordstar for Win v2 | \$29  |
| Wordstar v7         | \$223 |
| Wordstar v7 Upg     | \$98  |
| PFS: WindowWorks    | \$39  |

## PFS: Power Album

|                          |      |
|--------------------------|------|
| PFS: Power Album         | \$33 |
| PFS: Publisher for Win   | \$33 |
| PFS: CV & Job Search Pro | \$33 |
| Calendar Creator Plus    | \$33 |
| PC Paintbrush            | \$42 |
| PhotoFinish for Win      | \$85 |

## SHAPEWARE

|                                |      |
|--------------------------------|------|
| Shapeware Visio V3 for Windows | \$89 |
|--------------------------------|------|

## SPC

|                             |       |
|-----------------------------|-------|
| Harvard Graphics DOS        | \$279 |
| Harvard Graphics v3 for Win | \$148 |
| Superbase 4 Developers      | \$599 |

## UTILITIES/COMMS

|                          |      |
|--------------------------|------|
| Carbon copy plus Windows | \$75 |
| Carbon Copy Plus v6 DOS  | \$75 |

## Crosstalk Mik4 v2.1 DOS

|                               |       |
|-------------------------------|-------|
| Crosstalk Mik4 v2.1 DOS       | \$127 |
| Crosstalk for Windows         | \$66  |
| Fontware Face Pack 2          | \$19  |
| Gibson Spinrite II            | \$39  |
| Fastback Plus                 | \$75  |
| Laplink Pro v5 Dos            | \$59  |
| Laplink V1 Win                | \$83  |
| Stacker 4 DOS/WIN             | \$62  |
| Stacker 4 Comp Upg            | \$37  |
| Smartcom for Windows          | \$99  |
| Smartem 320 v4 DOS            | \$165 |
| Smartem 420 Win               | \$149 |
| Procomm Plus for Win v2       | \$57  |
| Procomm Plus v2 DOS           | \$55  |
| QEMM v7.5                     | \$45  |
| Xerox TextBridge OCR Software | \$87  |
| XtraDrive Disk Doubler        | \$39  |



IBM PC DOS 7



QuickTax 95



Quicken v4 for Windows



Visio v3 for Windows



AutoRoute Express Windows



# MICROSOFT



MSDOS 6.22 Upgrade

## APPLICATIONS

### MICROSOFT OFFICE

|                              |      |
|------------------------------|------|
| MS Office V4.2 WIN           | £318 |
| MS Office V4.2 WIN CD        | £318 |
| MS Office V4.2 WIN UPG       | £145 |
| MS Office V4.2 WIN C.U.      | £221 |
| MS Office V4.2 WIN MLP1      | £270 |
| MS Office V4.3 WIN PRO       | £411 |
| MS Office V4.3 WIN Pro CD    | £411 |
| MS Office V4.3 WIN Pro UPG   | £218 |
| MS Office V4.3 WIN Pro C.U.  | £258 |
| MS Office V4.3 WIN Pro MLP20 | £350 |
| MS Office Assistant          | £51  |
| MS Office Assistant MLP1     | £43  |

### MICROSOFT POWERPOINT

|                           |      |
|---------------------------|------|
| MS PowerPoint V4 WIN      | £218 |
| MS PowerPoint V4 WIN MLP1 | £185 |
| MS PowerPoint V4 WIN UPG  | £73  |
| MS PowerPoint V4 C.U.     | £110 |

### MICROSOFT PROJECT

|                        |      |
|------------------------|------|
| MS Project V4 WIN      | £273 |
| MS Project V4 WIN MLP1 | £232 |
| MS Project V4 WIN UPG  | £73  |

### MICROSOFT PUBLISHER

|                              |      |
|------------------------------|------|
| MS Publisher V2 WIN          | £59  |
| MS Publisher V2 WIN MLP1     | £48  |
| MS Schedule + V1 WIN         | £75  |
| MS Schedule + V1 WIN 5 PACK  | £152 |
| MS Schedule + V1 WIN 20 Pack | £519 |
| MS Test V3 WIN               | £373 |



Windows 3.1

## MICROSOFT FOXPRO

|                             |      |
|-----------------------------|------|
| MS FoxPro V2.6 DOS STD      | £56  |
| MS FoxPro V2.6 DOS STD MLP1 | £57  |
| MS FoxPro V2.6 DOS PRO      | £271 |
| MS FoxPro V2.6 WIN STD      | £66  |
| MS FoxPro V2.6 WIN STD MLP1 | £57  |
| MS FoxPro V2.6 WIN PRO      | £271 |

## MICROSOFT EXCEL

|                      |      |
|----------------------|------|
| MS Excel V5 WIN      | £218 |
| MS Excel V5 WIN MLP1 | £185 |
| MS Excel V5 WIN UPG  | £73  |
| MS Excel V5 WIN C.U. | £110 |

## MICROSOFT PRICES

|                          |      |
|--------------------------|------|
| MS Access V2 WIN         | £218 |
| MS Access V2 WIN MLP1    | £185 |
| MS Access V2 WIN UPG     | £73  |
| MS Access V2 C.U.        | £110 |
| MS Access V2 WIN DEV KIT | £218 |

## MICROSOFT WORD

|                               |      |
|-------------------------------|------|
| MS Word V6 WIN                | £218 |
| MS Word V6 WIN MLP1           | £185 |
| MS Word V6 WIN UPG            | £73  |
| MS Word V6 WIN C.U.           | £110 |
| MS Word V6 DOS                | £164 |
| MS Word V6 DOS MLP1           | £138 |
| MS Word for Windows assistant | £36  |

## MICROSOFT WORKS

|                      |     |
|----------------------|-----|
| MS Works V3 DOS      | £80 |
| MS Works V3 DOS MLP1 | £69 |
| MS Works V3 WIN      | £80 |
| MS Works V3 WIN MLP1 | £69 |
| MS Works V3 WIN UPG  | £36 |



MS Visual Basic Win

## MICROSOFT ACCESS

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|--------------------------|------|
| MS Access V2 WIN         | £218 |
| MS Access V2 WIN MLP1    | £185 |
| MS Access V2 WIN UPG     | £73  |
| MS Access V2 C.U.        | £110 |
| MS Access V2 WIN DEV KIT | £218 |

## OPERATING SYSTEMS

### MICROSOFT DOS

|                   |     |
|-------------------|-----|
| MS DOS V6.22      | £36 |
| MS DOS V6.22 MLP1 | £32 |

### MICROSOFT WINDOWS

|                            |     |
|----------------------------|-----|
| MS Windows V3.1            | £61 |
| MS Windows V3.1 MLP1       | £52 |
| MS Windows V3.1 UPG        | £36 |
| MS Windows printing system | £72 |

### MICROSOFT WINDOW NT

|                             |      |
|-----------------------------|------|
| MS NT Workstation V3.5      | £199 |
| MS NT Workstation V3.5 MLP1 | £169 |
| MS NT Server V3.5           | £442 |
| MS NT Server V3.5 MLP1      | £23  |

### MICROSOFT WINDOWS FOR WORKGROUPS

|                            |       |
|----------------------------|-------|
| MS WFWG V3.11              | £82   |
| MS WFWG V3.11 MLP1         | £80   |
| MS WFWG V3.11 MLP20        | £1558 |
| MS WFWG ADD-ON V3.11       | £36   |
| MS WFWG ADD-ON V3.11 MLP1  | £35   |
| MS WFWG ADD-ON V3.11 MLP20 | £671  |



Money v3

## LANGUAGES

|                      |      |
|----------------------|------|
| MS Delta V1 WIN      | £185 |
| MS Delta V1 WIN MLP5 | £772 |

### MICROSOFT FORTRAN

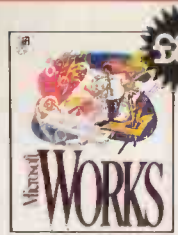
|                                |      |
|--------------------------------|------|
| MS Fortran V5.1                | £110 |
| MS Fortran Powerstation DOS    | £185 |
| MS Fortran Powerstation WIN NT | £318 |
| MS Macro Assembler V6.11       | £88  |
| MS Multiplan V4.2 DOS          | £83  |
| MS Quickbasic V4.5             | £77  |

### MICROSOFT VISUAL BASIC & C++

|                              |      |
|------------------------------|------|
| MS Visual Basic WIN          | £77  |
| MS Visual Basic WIN PRO      | £185 |
| MS Visual Basic V1.0 DOS     | £77  |
| MS Visual Basic V1.0 DOS PRO | £185 |
| MS Visual C++ V1.0 WIN       | £50  |
| MS Visual C++ V1.0 WIN PRO   | £185 |
| MS Visual C++ V2.0 WIN CD    | £240 |
| MS Visual CONTROL V1.0 WIN   | £55  |
| MS Visual TOOLS V1.5         | £165 |

## MULTIMEDIA/LEISURE

|                                  |     |
|----------------------------------|-----|
| MS Space Simulator DOS           | £24 |
| MS Best of Entertainment Windows | £10 |
| MS Ancient Lands CD              | £28 |
| MS Arcade WIN V1                 | £10 |
| MS Bookshelf WIN                 | £55 |
| MS Beethoven WIN CD              | £28 |
| MS Cinemania '95 WIN CD          | £27 |
| MS Creative Writer WIN           | £24 |
| MS Dangerous Creatures CD        | £28 |
| MS Dinosaurs WIN CD              | £28 |
| MS Encarta '95 WIN CD            | £55 |



MS Works v4

|                                 |      |
|---------------------------------|------|
| MS Fine Artist V1 WIN CD        | £24  |
| MS Fine Artist V1 WIN           | £24  |
| MS G Wilson Haunted House WIN   | £24  |
| MS Golf V2 WIN                  | £17  |
| MS Golf V2 WIN CD               | £17  |
| MS Golf ADD-ON Mauna Kea        | £10  |
| MS Golf ADD-ON Pinehurst        | £10  |
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| MS Magic BUS - Human Body       | £24  |
| MS Magic BUS - Solar System     | £24  |
| MS Mozart WIN CD                | £28  |
| MS Musical Instruments          | £28  |
| MS Multimedia Viewer V2 CD      | £185 |
| MS National Art Gallery WIN CD  | £28  |
| MS Scenes Sierra Club           | £14  |
| MS Scenes Outer Space           | £14  |
| MS Scenes Impressionist         | £14  |
| MS Schubert                     | £28  |
| MS Sound Bits MGM WIN           | £11  |
| MS Sound Bits World WIN         | £11  |
| MS Sound Bits Hanna Barbara WIN | £11  |
| MS Sound System V2 With Board   | £95  |
| MS Sound System V2 Software     | £26  |
| MS Strauss CD                   | £38  |
| MS Stravinski CD                | £80  |

## MOUSE/KEYBOARD

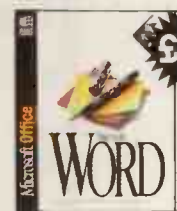
|                             |     |
|-----------------------------|-----|
| MS Mouse IntelliPoint Bus   | £44 |
| MS Mouse IntelliPoint Combi | £33 |
| MS Home Mouse               | £24 |
| MS Mouse Serial/PS2         | £33 |
| MS Mouse Ballpoint PS2      | £48 |
| MS Mouse Bus Dual           | £44 |
| MS Natural Keyboard         | £57 |



Encarta CD 95



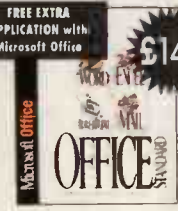
MS Creative Writer



MS Word upg from Works/Word



MS Excel upg from Excel



MS Office upg from works/other + FREE Extra application

# LOTUS



Lotus 123 v6 Upg.



Lotus Ami Pro v3.1



Lotus Freelance v2.1 Upg



Lotus Smartpics



Lotus SmartSuite 3 special price for users of any Lotus product

|                           |      |
|---------------------------|------|
| Lotus 123 V2.4 DOS        | £234 |
| Lotus 123 V4 DOS          | £267 |
| Lotus 123 Rel 5 Ver Upg   | £89  |
| Lotus 123 Win Rel 5 cu    | £139 |
| Lotus 123 Rel 5           | £235 |
| Ami Pro v2 for Windows    | £29  |
| Ami Pro v2 + CorelDraw V3 | £119 |
| Ami Pro v3.1              | £84  |
| Approach v3 for Windows   | £82  |
| Freelance v4 DOS          | £270 |

|                          |      |
|--------------------------|------|
| Freelance v2-Verson Upg  | £89  |
| Freelance V2-Com Upgrade | £139 |
| Freelance v2.01          | £268 |
| Improv for Windows       | £86  |
| Organizer v2             | £85  |
| Organizer v1.0           | £39  |
| Lotus Write v2           | £41  |
| Smartpics clipart        | £84  |

|                       |      |
|-----------------------|------|
| SmartSuite 3 Upgrade  | £159 |
| SmartSuite 3 Comp Upg | £218 |
| SmartSuite 3          | £325 |
| SmartSuite bundles    | £POA |

# NOVELL

## Networks

|                         |       |
|-------------------------|-------|
| Novell Personal Network | £43   |
| Nehware 3.12 5usr       | £388  |
| Nehware 3.12 10usr      | £909  |
| Nehware 4.1 5usr CD     | £489  |
| Nehware 4.1 10user CD   | £1159 |

## Office products

|                    |      |
|--------------------|------|
| Perfect Office Upg | £139 |
|--------------------|------|

|                             |      |
|-----------------------------|------|
| Perfect Office CV           | £169 |
| Perfect Office Pro          | £301 |
| Presentations DOS           | £214 |
| Presentations comp Upg. DOS | £99  |
| Presentations Win v2        | £214 |
| Presentations comp Upg. Win | £99  |
| WordPerfect 6 for DOS       | £211 |
| WordPerfect 6 DOS Upgrade   | £73  |

|                                |      |
|--------------------------------|------|
| WordPerfect 6 DOS Comp Upgrade | £105 |
| WordPerfect 6.1 for Win        | £163 |
| WordPerfect 6.1 Win Upgrade    | £62  |
| WordPerfect 6.1 Win Comp Upg   | £75  |
| Quattro Pro for Windows V5     | £29  |
| Quattro Pro for Windows V6     | £301 |
| WP MAIN STREET                 | £57  |
| WP InfoCentral                 | £57  |

|                       |     |
|-----------------------|-----|
| WP Works              | £58 |
| WP LetterPerfect      | £29 |
| WP Grammarik          | £28 |
| WP Clipart for Home   | £21 |
| WP Clipart for Office | £21 |
| WP Clipart for Kids   | £21 |
| WP Clipart Premium CD | £44 |
| WP Express Fax+       | £35 |

|                                |     |
|--------------------------------|-----|
| WP Kap'n Karaoke               | £21 |
| WP Wallabee Jack - Thai Sun CD | £21 |
| WP Wallabee Jack - Bing Burro  | £21 |
| Stone CD                       | £21 |
| WP Mickey's Memory Challenge   | £21 |
| WP Mickey's Jigsaw Puzzles     | £21 |

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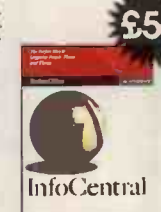
Perfect Office UPG £139



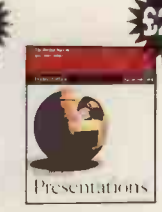
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Quattro Pro V6 Scall



Info Central £57



Presentations £214

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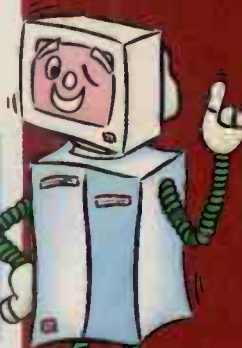
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| Fujitsu     | M2682T  | 353Mb    | 12.0ms | 3.5" 1" | 2 yrs | 256k  | £0.33/Mb | £115  |
| Quantum     | LT365AT | 365Mb    | 12.0ms | 3.5" 1" | 2 yrs | 128k  | £0.33/Mb | £122  |
| West Digit. | WD2420  | 420Mb    | 13.0ms | 3.5" 1" | 3 yrs | 64k   | £0.29/Mb | £120  |
| Conner      | CFS420A | 420Mb    | 14.0ms | 3.5" 1" | 2 yrs | 32k   | £0.29/Mb | £123  |
| Seagate     | ST3491A | 428Mb    | 14.0ms | 3.5" 1" | 3 yrs | 120k  | £0.29/Mb | £125  |
| Fujitsu     | M2684T  | 532Mb    | 12.0ms | 3.5" 1" | 2 yrs | 256k  | £0.29/Mb | £153  |
| Conner      | CFS540A | 540Mb    | 14.0ms | 3.5" 1" | 2 yrs | 64k   | £0.25/Mb | £135  |
| Quantum     | LT540AT | 540Mb    | 11.0ms | 3.5" 1" | 2 yrs | 128k  | £0.31/Mb | £168  |
| West Digit. | WD2540  | 540Mb    | 12.0ms | 3.5" 1" | 3 yrs | 64k   | £0.29/Mb | £157  |
| Quantum     | MV540AT | 540Mb    | 14.0ms | 3.5" 1" | 2 yrs | 128k  | £0.27/Mb | £145  |
| Seagate     | ST3660A | 545Mb    | 14.0ms | 3.5" 1" | 3 yrs | 128k  | £0.27/Mb | £147  |

### 700MB AND UP

|             |          |         |        |         |       |      |          |      |
|-------------|----------|---------|--------|---------|-------|------|----------|------|
| Quantum     | LT730AT  | 730Mb   | 11.0ms | 3.5" 1" | 2 yrs | 128k | £0.25/Mb | £179 |
| Conner      | CFA850A  | 850Mb   | 12.0ms | 3.5" 1" | 2 yrs | 256k | £0.22/Mb | £188 |
| West Digit. | WD2850   | 851Mb   | 10.0ms | 3.5" 1" | 3 yrs | 64k  | £0.21/Mb | £175 |
| West Digit. | WD3100   | 1,083Mb | 10.0ms | 3.5" 1" | 3 yrs | 64k  | £0.22/Mb | £243 |
| Conner      | CFA1275A | 1,275Mb | 12.0ms | 3.5" 1" | 2 yrs | 256k | £0.34/Mb | £432 |
| West Digit. | WD31200  | 1,282Mb | 10.0ms | 3.5" 1" | 3 yrs | 128k | £0.28/Mb | £359 |

## REWRITABLE OPTICAL DISKS

|            |         |       |       |       |
|------------|---------|-------|-------|-------|
| Fujitsu    | M2512A  | 230Gb | £474  | £577  |
| Sony       | SM0F521 | 1.3Gb | £1322 | £1399 |
| H. Packard | C1716T  | 1.3Gb | £1599 | £1799 |

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## MEMORY

| Capacity | Pins | Price |
|----------|------|-------|
| 1Mb      | 30   | £39   |
| 4Mb      | 30   | £120  |
| 1Mb      | 72   | £42   |
| 4Mb      | 72   | £123  |
| 8Mb      | 72   | £260  |
| 16Mb     | 72   | £499  |
| 32Mb     | 72   | £899  |

## SCSI HARD DRIVES

### Up To 1 Gb

| Make    | Model  | Capacity | Access | Size    | Wrrty | Cache | Price/Mb | Price |
|---------|--------|----------|--------|---------|-------|-------|----------|-------|
| Fujitsu | M2682S | 353Mb    | 12.0ms | 3.5" 1" | 2 yrs | 256k  | £0.34/Mb | £120  |
| Quantum | LT365S | 365Mb    | 12.0ms | 3.5" 1" | 2 yrs | 128k  | £0.34/Mb | £125  |
| Fujitsu | M2684S | 532Mb    | 12.0ms | 3.5" 1" | 2 yrs | 256k  | £0.29/Mb | £155  |
| Quantum | MV540S | 540Mb    | 14.0ms | 3.5" 1" | 2 yrs | 128k  | £0.28/Mb | £152  |
| Quantum | LT540S | 540Mb    | 11.0ms | 3.5" 1" | 2 yrs | 128k  | £0.31/Mb | £169  |
| Quantum | LT730S | 730Mb    | 11.0ms | 3.5" 1" | 2 yrs | 128k  | £0.26/Mb | £189  |

### 1 Gb - 1.9 Gb

|         |         |         |        |         |       |      |          |      |
|---------|---------|---------|--------|---------|-------|------|----------|------|
| HP      | C3323SE | 1,050Mb | 9.5ms  | 3.5" 1" | 5 yrs | 512k | £0.36/Mb | £374 |
| Quantum | 1080S   | 1,080Mb | 10.0ms | 3.5" 1" | 5 yrs | 512k | £0.35/Mb | £381 |
| Fujitsu | M1606S  | 1,090Mb | 11.0ms | 3.5" 1" | 5 yrs | 512k | £0.32/Mb | £345 |
| Quantum | 1440S   | 1,440Mb | 10.0ms | 3.5" HH | 5 yrs | 512k | £0.38/Mb | £543 |

### 2 Gb to 4 Gb

|            |           |         |        |         |       |      |          |        |
|------------|-----------|---------|--------|---------|-------|------|----------|--------|
| Quantum    | 2100S     | 2,100Mb | 9.5ms  | 3.5" HH | 5 yrs | 512k | £0.34/Mb | £720   |
| HP         | C2490SE   | 2,100Mb | 8.9ms  | 3.5" 1" | 5 yrs | 256k | £0.34/Mb | £724   |
| Micropolis | MIC4221   | 2,100Mb | 8.5ms  | 3.5" HH | 5 yrs | 512k | £0.35/Mb | £730   |
| Micropolis | MIC4221AV | 2,100Mb | 8.5ms  | 3.5" HH | 5 yrs | 512k | £0.37/Mb | £770   |
| Fujitsu    | M2903S    | 2,110Mb | 11.0ms | 3.5" HH | 5 yrs | 512k | £0.38/Mb | £810   |
| Fujitsu    | M2909S    | 3,100Mb | 11.0ms | 3.5" HH | 5 yrs | 512k | £0.33/Mb | £1,028 |

### 4 Gb AND UP

|            |           |         |        |          |       |      |          |        |
|------------|-----------|---------|--------|----------|-------|------|----------|--------|
| Quantum    | GP4280S   | 4,280Mb | 8.6ms  | 3.5" HH  | 5 yrs | 512k | £0.29/Mb | £1,250 |
| Micropolis | MIC3243   | 4,300Mb | 8.5ms  | 3.5" HH  | 5 yrs | 512k | £0.25/Mb | £1,075 |
| Micropolis | MIC3243AV | 4,300Mb | 8.5ms  | 3.5" HH  | 5 yrs | 512k | £0.26/Mb | £1,131 |
| Micropolis | MIC1991   | 9,100Mb | 12.0ms | 5.25" FH | 5 yrs | 512k | £0.22/Mb | £1,999 |
| Micropolis | MIC1991AV | 9,100Mb | 12.0ms | 5.25" FH | 5 yrs | 512k | £0.23/Mb | £2,050 |

Please call for external SCSI

## TAPE BACK UP

|            |         |                   | int   | ext   |
|------------|---------|-------------------|-------|-------|
| Colorado   | D120    | 125/250Mb         | £107  | £172  |
| H. Packard | HP35470 | DAT 2 Gb          | £572  | £657  |
| H. Packard | JS2000  | DAT 2 Gb          | £650  | £780  |
| Sony       | SDT5200 | DAT DDS2 4 Gb     | £573  | £642  |
| H. Packard | HP35480 | DAT 4/8 Gb        | £657  | £742  |
| H. Packard | JS5000  | DAT 4/8 Gb        | £739  | £868  |
| H. Packard | HPC1533 | DAT DDS2 4/16 Gb  | £770  | £860  |
| H. Packard | JS6000  | DAT DDS2 4/16 Gb  | £892  | £989  |
| Sony       | SDT5000 | DAT DDS2 4/16 Gb  | £639  | £708  |
| H. Packard | HPC1553 | DAT DDS2 24/96 Gb | £1599 | £1650 |

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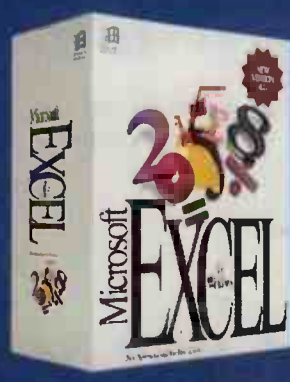




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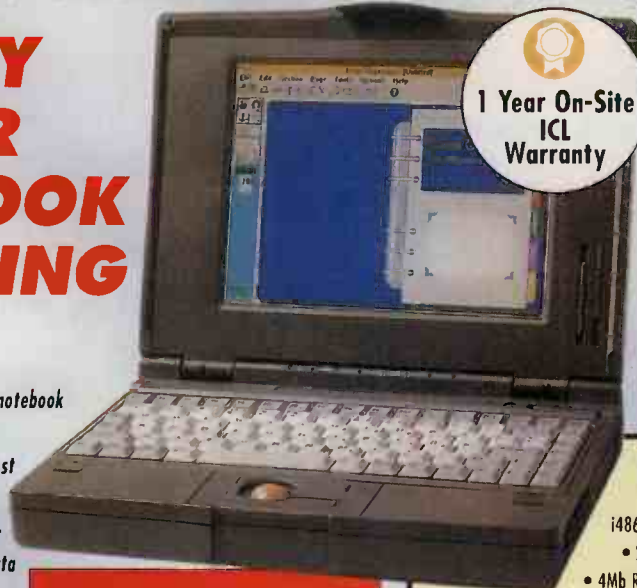
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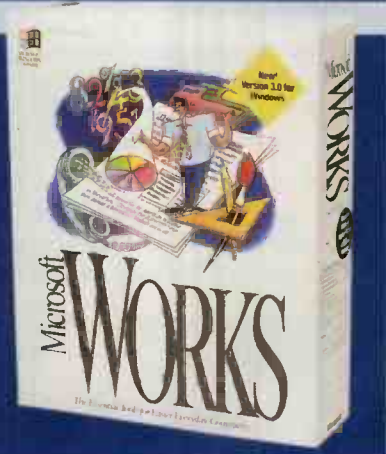
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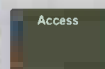
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|-------------------------------|--------|
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| Transparencies(50) .....      | £49.95 |

Copy of print using 300 x 300 DeskJet 560C

Copy of print using 720 x 720 Stylus Colour

## PRINT SAMPLE COMPARISON



Easy to operate, easy to accommodate, and easily affordable, it's the perfect printer for first time laser buyers and everyday printing applications

- 4 ppm A4 paper
- 300 x 300 dpi resolution plus resolution enhancement technology provides quality comparable to 600 dpi
- 14 scalable fonts and 5 Bitmap fonts
- PCL 5e printer language
- 1Mb memory upgradeable to 5mb using industry standard simms

- High speed bi-directional parallel interface
- In-built paper tray provides capacity for 150 cut sheets, also accepts OHP film, envelopes and self-adhesive labels
- Imaging cartridge lasts for approximately 4,500 pages
- 1 year on-site warranty

## OTHER LASER PRINTERS

EPL-5200.....£460  
6 ppm, PCL 5, 1mb, parallel & serial  
EPL-5600.....£579  
6 ppm, PCL 5e, 2mb, parallel & serial

## DOT MATRIX PRINTERS

### 24 Pin Matrix Printers

LQ-100.....£96  
80 column, 200/72 cps, 11k buffer, parallel & serial  
LQ-150.....£115  
80 column, 216/79 cps, 11k buffer, parallel  
LQ-300.....£141  
80 column, 240/80 cps, 8k buffer, parallel & serial  
LQ-570+.....£184  
80 column, 269/90 cps, 8k buffer, parallel  
LQ-1070+.....£273  
136 column, 269/90 cps, 8k buffer, parallel  
LQ-870.....£340  
80 column, 330/110 cps, 8k buffer, parallel  
LQ-1170.....£392  
136 column, 330/110 cps, 8k buffer, parallel  
DLQ-3000.....£715  
136 column, 432/144 cps, 128k buffer, parallel

## DOT MATRIX PRINTERS

### 9 Pin Matrix Printers

LX-300.....£87  
80 column, 264/53 cps, 4k buffer, parallel & serial  
LX-100.....£92  
80 column, 342/68 cps, 4k buffer, parallel  
LX1050+.....£169  
136 column, 240/48 cps, 4k buffer, parallel  
FX-870.....£220  
80 column, 342/68 cps, 24k buffer, parallel  
FX-1170.....£278  
136 column, 342/68 cps, 24k buffer, parallel  
DFX-5000+.....£1039  
136 column, 504/101 cps, 20k buffer, parallel & serial  
DFX-8000.....£1849  
136 column, 960/192 cps, 3k buffer, parallel & serial

## EPSON SCANNERS

Epson's new GTX range of scanners for the PC are high quality professional flat-bed colour scanners with resolutions of up to 2400 dpi. All come with either a parallel PC AT interface card or SCSI card and include excellent software (Caere Omnipage Direct OCR Software and Adobe Photoshop LE)



GTX-6500 Parallel AT Card.....£449  
24-Bit flatbed colour scanner with 300 dpi optical and 1200 dpi output resolutions  
GTX-6500 SCSI.....£509  
As above but with SCSI interface  
GTX-8000 Parallel AT Card.....£559  
27-Bit flatbed colour scanner with 400 dpi optical and 1600 dpi output resolution

GTX-8000 SCSI.....£625  
As above but with SCSI interface  
GTX-9000 Parallel AT Card.....£859  
30-Bit flatbed colour scanner with 600 dpi optical and 2400 dpi output resolution

"I will beat any EPSON price"

\*see my price guarantee

## EPSON TOP 5

- 1 Stylus Colour .....£323
- 2 Stylus 800+ .....£168
- 3 Stylus 1000 .....£309
- 4 LQ 100 .....£96
- 5 EPL 3000 .....£389

Terms & conditions  
All prices are subject to VAT (17.5%) and delivery and may change without notice. Goods are normally delivered within a few days of cleared payment. All orders will be fulfilled within 28 days unless otherwise notified. No surcharges are made to Access, Visa, Amex or Switch. Goods are not supplied on a trial basis. Credit account orders are normally 3% extra. Errors and omissions exempted. Business user prices shown. End user enquiries welcome.



Mr PC is a division of Corporate Systems Ltd

\*MR PC PRICE GUARANTEE  
Due to our huge buying power, our advertised prices are normally the lowest in the UK. If you find a lower advertised price on any current ex-stock product which is confirmed to be genuine, we will beat that price. This guarantee applies to our advertised prices and excludes clearance products sold below cost.

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"Please call me for the latest prices"



**Mr PC**



# MONITORS Direct

Quality graphics products  
at unbeatable prices - from stock!



**New!**

## New from Hitachi - CM2096

Super value 20"  
monitor - 1280 x 1024  
at 77Hz, full micro-  
processor control of  
geometry & colour  
balance, full Energy  
Star DPMS - ONLY:

**£935**

### DIGITIZERS

Manufactured in the USA, our digitizers offer high quality and specifications. Larger sizes and backlit models are available, with a full range of accessories.

|    |                              |      |
|----|------------------------------|------|
| A4 | 12" X 12" with 4 button puck | £198 |
| A3 | 12" X 18" with 4 button puck | £310 |

### CD-ROM DRIVES

All our Sony drives are double speed, multisession and Photo CD compatible



## SONY

|                     |                   |      |
|---------------------|-------------------|------|
| CDU-55E, internal   | Includes IDE I/F  | £98  |
| CDU-7305N, external | includes Sony I/F | £287 |
| CDU-561, internal   | requires SCSI I/F | £226 |
| CDU-7811, external  | requires SCSI I/F | £329 |

### MAGNETO-OPTICAL

High capacity, rewritable storage systems for on-line retrieval, backup or archive.



## SONY

|          |             |        |
|----------|-------------|--------|
| RMO-S350 | 3.5" 128Mb  | £1,135 |
| RMO-S570 | 5.25" 1.3Gb | £1,975 |

### COLOUR PRINTERS

Whether it's dye-sublimation for photographic quality or thermal wax for high value colour graphics, Mitsubishi has a printer to suit



#### Thermal wax

|          |                    |        |
|----------|--------------------|--------|
| G2700-1  | A4, 300dpi         | £675   |
| G370-10  | A4, 300dpi         | £ call |
| G6710-10 | A3 + bleed, 300dpi | £ call |

#### Dye-sublimation

|          |                    |        |
|----------|--------------------|--------|
| S3410-30 | A4, 150dpi         | £ call |
| S3600-30 | A4, 300dpi         | £ call |
| S6600-30 | A3 + bleed, 300dpi | £ call |

**MONITORS  
DIRECT**

Monitors Direct, Alfreton Rd  
Derby, DE21 4AD

All trademarks acknowledged. All orders are subject to our standard terms & conditions - available on request. E&OE.

### GRAPHICS CARDS



|   |          |      |
|---|----------|------|
| Magician-1024, 1Mb  | ISA      | £100 |
| Magician-1280, 1Mb  | ISA      | £150 |
| Orion 3Star, 2Mb  | ISA & VL | £399 |
| Tornado, 4Mb  | PCI      | £499 |
| Weitek P9100, 1280 x 1024 @ True Colour & Very high refresh |          |      |
| Tornado-VIP, 4Mb, Video accelerator                         | PCI      | £549 |



Datapath's software and twin graphics cards give a seamless dual screen Windows desktop



#### TWINOrion-1 1024

|     |      |
|-----|------|
| ISA | £899 |
|-----|------|

#### TWINOrion-2 1280

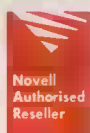
|     |      |
|-----|------|
| ISA | £999 |
|-----|------|

VL & PCI also available

## matrox

|                           |        |
|---------------------------|--------|
| MGA Ultima Range          | £ call |
| MGA Impression Plus Range | £ call |

### NETWORKING



We are a Novell Authorised Reseller specialising in:

- pre-configured servers
- network installations
- cabling installations

Ring to discuss how we can help.

### LCD Displays

Superbly compact, high definition TFT colour LCD displays

## SHARP

|                                     |       |        |
|-------------------------------------|-------|--------|
| LCD-10C1M/U                         | 10.4" | £2,700 |
| 4096 colours, for data applications |       |        |
| QD-100MM                            | 10.4" | £4,839 |
| 16.7M colours, for data or video    |       |        |

### COLOUR MONITORS

Our speciality - the best monitors at the best prices. Call us for prices on Eizo and Hitachi Europe monitors.

## HITACHI

|             |        |
|-------------|--------|
| 15MVX plus  | £309   |
| 17MVX Value | £500   |
| 17MVX plus  | £759   |
| CM2096      | £935   |
| CM2098M     | £1,127 |
| CM2198M     | £1,466 |
| CM2199MET   | £1,979 |



## Samsung

|                  |      |
|------------------|------|
| CVM4967          | £175 |
| CVP4237          | £187 |
| SyncMaster 15GL  | £270 |
| SyncMaster 17GL  | £499 |
| SyncMaster 17GLS | £587 |
| SyncMaster 20GLS | £999 |

## SONY

|             |        |
|-------------|--------|
| CPD-15SF1   | £285   |
| CPD-17SF1   | £590   |
| GDM-17SE1   | £825   |
| GDM-20SE1VT | £1,295 |
| GDM-20SE1T  | £1,405 |



Sony extended 3 year on-site warranty available

## iiyama

|                 |        |
|-----------------|--------|
| MF-8115         | £259   |
| MF-8617A        | £536   |
| MF-8221         | £1,247 |
| MF-8621         | £1,645 |
| MT-9121 Diatron | £1,293 |

## MITSUBISHI

|                                   |        |
|-----------------------------------|--------|
| DiamondScan 15FS                  | £335   |
| DiamondPro 17TX                   | £685   |
| DiamondPro 20X                    | £990   |
| DiamondPro 21T                    | £1,330 |
| 29" and 37" presentation monitors | £ call |



## Formac

|                     |      |
|---------------------|------|
| ProNitron 80.17 17" | £499 |
|---------------------|------|

## TAXAN

|                |     |        |
|----------------|-----|--------|
| 400LR          | 14" | £193   |
| 410LR          | 14" | £203   |
| 420LR          | 14" | £240   |
| 580LR          | 15" | £291   |
| 880LR          | 17" | £532   |
| 885LR          | 17" | £634   |
| UV1080LR       | 20" | £948   |
| 2100LR Diatron | 21" | £1,556 |



### Our Price Pledge

We aim to beat any advertised price. If you can buy better elsewhere, don't - call us!!

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ALL PRICES EXCLUDE DELIVERY & VAT

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line.... Fax **01332 290667**



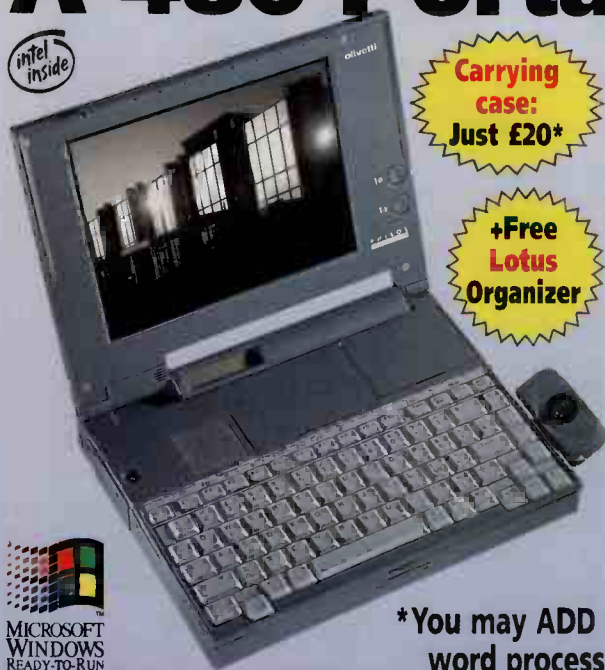




LANTEC

# Two amazing deals from LANTEC DIRECT

## A 486 Portable for **£599!**



**Carrying case:  
Just £20\***

**+Free  
Lotus  
Organizer**

**olivetti**

### The Olivetti Philos 20 486

- Intel 486SL, 25Mhz, (3.3v) Microprocessor
- 4Mb RAM (expandable to 32Mb)
- 2.5" hard disk drive
- 120 Mb capacity
- 3.5" 1.44Mb floppy drive (removable)
- Backlit, VGA passive Matrix Mono LCD screen with:
  - 64 grey shades
  - 8.4" diagonal size
- 82/83-key, PS/2 compatible keyboard
- Rechargeable 15 Watt NiCad battery. (Battery life is from 3 to 6 hours depending upon peripherals used.)

- Integrated Pop-Up Trackball
- Serial port (RS232-C compatible)
- Parallel printer port
- External VGA video proprietary interface
- External keyboard/mouse port (PS/2 compatible)
- MS DOS 5.0 (or later)
- MS Windows 3.1
- Lotus Organizer for Olivetti
- Online manuals
- Interlink for file transfer
- File transfer cable
- Dimensions - 279mm x 216mm x 45mm
- Weight - 2.1kg
- "ExtraTime" Power Management System



**\*You may ADD Lotus 1-2-3 spreadsheet v4.01 and Lotus AmiPro word processing v3.01 AND the Carrying Case for JUST £50**

## A Fast TFT Colour 486 for **£1199!**



### THE LOWEST PRICE

Remember, this is a TFT (Thin Film Transistor) Colour screen. Check it out! Look through this magazine and see if you can purchase a TFT system for less!

### DECpc 425SLC/e TFT

- Intel 486SL 25Mhz 3.3v processor
- Integrated 486SL maths co-processor
- 8Kb internal cache memory
- Built-in sound system and speaker
- 4Mb of fast system RAM
- RAM expandable to 32Mb
- Removable IDE 120Mb hard disk drive
- 1.44Mb removable 3.5" floppy disk drive
- 8.4" Thin Film Transistor (TFT) Active Matrix colour LCD display
- On-board video controller with 512KB of video RAM
- Resolution: 640 x 480 in 256 colours on integrated LCD TFT display, or up to 1024 x 768 in 16 colours on external monitor - simultaneous display in 640x480 mode
- PCMCIA version 2.0 type III slot
- 98/99 key keyboard
- Integrated pop-up trackball mouse
- Interfaces: 1 serial, 1 parallel, external monitor & PS/2 standard mouse / keyboard socket, dock box connector port
- Nickel-Metal-Hydride (NiMH) battery pack
- Battery life up to 9.45 hours (maximum)
- Advanced power management
- Intelligent peripheral time-outs and suspend mode
- Service LCD panel "Fuel Gauge"
- Autosensing power supply - quick charges in only 85 minutes with system off
- MS DOS and Windows 3.1 included
- Weighs only 2.5Kg including battery
- FREE Carrying case
- Three year return-to-base warranty

## Interest Free Credit!

Personal and business INTEREST FREE CREDIT terms are available on this system at 0% APR to businesses and persons over the age of 18, subject to status and payment of instalments by direct debit. A deposit of 25% is required and six equal instalments. Example: Purchase price: £1,410 including VAT. £352.50 deposit is required, plus six monthly instalments of £176.25p. LANTEC are licensed Credit Brokers. Offer is subject to change without notice. Written quotations available upon request.

# 01753 777777

All prices EXCLUDE VAT and DELIVERY and are subject to change without notice. Extended Warranty: Options for 1, 2, or 3 years are available on all systems and printers. Ask our staff to quote you the low LANTEC DIRECT price for this total peace of mind. Delivery Charges: PC System £14 + VAT, Peripherals (printers etc.) £10 + VAT, Software/small items etc £5 + VAT. To order, call the LANTEC DIRECT Orderline or fax your order to 01753 777780. Alternatively, send your order with a cheque or postal order to: LANTEC DIRECT • Langley Business Centre • Station Road • Langley • Berkshire • SL3 8YR. Please allow 7 working days for cheque clearance. Although most orders are despatched the same or following day, please allow 28 days for delivery. Any potential delivery problem will be notified to you. Credit cards will not be debited until goods are ready for despatch. All registered trademarks acknowledged. Computer displays may be simulated. E&OE. All orders are subject to LANTEC DIRECT Terms and Conditions of Sale, copies of which are available upon request.



**LANTEC DIRECT** The Portable PC company





## COMPAQ Portables at keen LANTEC DIRECT Prices



### Compaq Contura Aero

- 486 SX SL-enhanced 25Mhz or 33Mhz Intel processor
- 8kb Cache Memory
- 4mb RAM, expandable to 12Mb
- 170Mb Hard disk as standard
- 8" Mono 640 x 480 VGA Backlit LCD display or 7.8" STN colour 640 x 480 VGA Backlit LCD display
- External 3.5" 1.44Mb floppy drive now included
- 1 x PCMCIA Type II slot
- Integrated Trackball mouse
- DOS 6.2, Windows 3.1, Lotus Organizer
- WinLink file transfer utility
- 2.5 to 4 hours battery life
- Weighs just 1.6 Kg including battery
- 3 Years European Warranty

Aero 4/25 with  
25Mhz processor  
and mono screen

Aero 4/33 with  
33Mhz processor  
and colour screen

**£769**

**£1029**

### Compaq LTE Elite Series

- 486DX2 40Mhz SL-Enhanced Intel Microprocessor
- 8KB of internal cache memory
- 4Mb of RAM memory expandable to 20Mb
- 2 x PCMCIA Rel 2.0 Type II slots (or 1 x Type III)
- Integrated internal AC power adapter/charger
- 8.4" Compaq TFT Active Matrix colour LCD Screen
- VGA graphics supports 27,000 colours
- Integrated Compaq enhanced EasyPoint Trackball
- Total carrying weight from 6.8lbs
- SmartStation and MiniStation deskbases available
- 3 years world-wide warranty



Model 340/W

Model 170/W

**£2239**

**£2069**



### Compaq Contura 410C

- 486 DX2 50Mhz SL-Enhanced Intel processor
- 8kb of internal Cache Memory
- 4mb RAM, expandable to 20Mb
- 350Mb Hard disk (upgradable)
- 9.5" STN dual scan colour screen 640 x 480 VGA
- 1Mb of Video RAM providing 1024 x 768 resolution on optional external monitor
- 2 x PCMCIA Rel 2.0 Type II slots (or 1 x type III)
- Integrated 19mm trackball mouse
- DOS 6.2, Windows 3.1, Lotus Organizer
- Weighs just 5.9lbs and includes free slip case
- Up to 5.5 hours battery life
- Port replicator available for Ethernet connectivity
- 3 Years European Warranty

**£1699**

## Brand new models, just released by TOSHIBA



**The Toshiba T2100 Family**  
Recently introduced by Toshiba, the T2100 family represents the very latest technology including some models with built-in CD ROM drive and sound system. There are several family members. Choose which is the right one for you!

**NEW**

### The Toshiba T2100

- Intel 486DX2 microprocessor
- 50Mhz clock speed
- 4Mb RAM expandable to 28Mb
- 260Mb hard disk
- 1.44Mb floppy
- SVGA graphics adapter
- 9.5" mono dual scan STN display
- 64 greyscales on STN display
- External monitor port (256 colours)
- 640 x 480 pixel resolution
- 2 x PCMCIA Release 2.0 Type II slots
- PS/2 keyboard/mouse port
- Optional Port Replicator
- Toshiba Trackpoint
- 84 full-size keys & 12 function keys
- Built-in autosensing AC adapter
- MS DOS 6.2 & Windows version 3.11
- Rechargeable NiH2 4.5 hour battery
- Three years international warranty

**£1019**

### The Toshiba T2100CS

- Intel 486DX2 microprocessor
- 50Mhz clock speed
- 4Mb RAM expandable to 28Mb
- 350Mb hard disk
- 1.44Mb floppy
- SVGA graphics adapter
- 10.4" colour dual scan STN display
- 256 colours on 640 x 480 STN display
- 640 x 480 x 64,000 colours or 1024 x 768 x 256 colours on external monitor
- 2 x PCMCIA Release 2.0 Type II slots
- PS/2 keyboard/mouse port
- Optional Port Replicator
- Toshiba Trackpoint
- 84 full-size keys & 12 function keys
- Built-in autosensing AC adapter
- MS DOS 6.2 & Windows version 3.11
- Rechargeable NiH2 3.5 hour battery
- Three years international warranty

**£1619**

### The Toshiba T2100CT

- Intel 486DX2 microprocessor
- 50Mhz clock speed
- 8Mb RAM expandable to 32Mb
- 350Mb hard disk
- 1.44Mb floppy
- SVGA graphics adapter
- 8.4" colour TFT display
- Up to 64,000 colours on 640 x 480 TFT display
- External monitor port
- 2 x PCMCIA Release 2.0 Type II slots
- PS/2 keyboard/mouse port
- Optional Port Replicator
- Toshiba Trackpoint
- 84 full-size keys & 12 function keys
- Built-in autosensing AC adapter
- MS DOS 6.2 & Windows version 3.11
- Rechargeable NiH2 3.5 hour battery
- Three years international warranty

**£2219**

### The Toshiba T2150CDS

- Intel 486DX4 microprocessor
- 75Mhz clock speed & 16Kb cache
- 4Mb RAM expandable to 28Mb
- 260Mb hard disk
- Integrated IDE CD ROM drive
- External 1.44Mb floppy included
- Sound system built-in
- 10.4" colour dual scan STN display
- 256 colours on 640 x 480 STN display
- 640 x 480 x 64,000 colours or 1024 x 768 x 256 colours on external monitor
- 2 x PCMCIA Release 2.0 Type II slots
- PS/2 keyboard/mouse port
- Optional Port Replicator
- Toshiba Trackpoint
- Built-in autosensing AC adapter
- MS DOS 6.2 & WFWG 3.11
- Rechargeable NiH2, 2 hour battery
- Three years international warranty

**£2299**

### The Toshiba T2150CDT

- Intel 486DX4 microprocessor
- 75Mhz clock speed & 16Kb cache
- 8Mb RAM expandable to 32Mb
- 520Mb hard disk
- Integrated IDE CD ROM drive
- External 1.44Mb floppy included
- Sound system built-in
- 10.4" colour TFT display
- 64,000 colours on 640 x 480 TFT display
- 640 x 480 x 64,000 colours or 1024 x 768 x 256 colours on external monitor
- 2 x PCMCIA Release 2.0 Type II slots
- PS/2 keyboard/mouse port
- Optional Port Replicator
- Toshiba Trackpoint
- Built-in autosensing AC adapter
- MS DOS 6.2 & WFWG 3.11
- Rechargeable NiH2, 2 hour battery
- Three years international warranty

**£3419**





LANTEC

# LANTEC present the digital HiNote family

## The Digital "HiNote" colour notebooks

- Choice of 486SX 33Mhz with 240Mb hard drive or 486DX2 50Mhz with 340Mb hard drive
- 4Mb RAM expandable to 20Mb
- 9.5" DSTN screen
- Local Bus video providing 640 x 480 x 256 colours on internal screen or up to 1024 x 768 x 16 colours on external display (1024 x 768 x 256 colours on DX2 50)
- Integrated trackball mouse and palm rest area
- 8Kb internal cache memory
- PCMCIA 2.1 type III or II slot (2 x type II slots in DX2 50)
- 1.44Mb floppy drive
- Long life Nickel-Metal-Hydride (NiMH) Battery
- Serial and parallel port
- MS DOS 6.22 and Windows for Workgroups 3.11 pre-installed
- Windows '95 ready
- Free Lotus Organizer
- Weights under 2.5kg
- 3 year return to base warranty



**486SX 33Mhz  
DSTN 240Mb  
£1499**

**486DX2 50Mhz  
DSTN 340Mb  
£1699**

## The Digital "HiNote Ultra" colour notebooks

- 486DX2 50Mhz Intel processor
- 340Mb hard drive
- Choice of 9.5" colour DSTN with 4Mb RAM (maximum 20Mb) or 9.5" colour TFT with 8Mb RAM (maximum 24Mb)
- Integrated trackball mouse
- Business Audio/MS Sound System, microphone and speaker (SoundBlaster compatible)
- Local Bus video & accelerator providing 640 x 480 x 256 colours on internal screen or up to 1024 x 768 x 256 colours on external display
- Wireless InfraRed connectivity
- 1 x PCMCIA 2.1 type III or 2 x type II slots
- Zero footprint, hot dockable snap-on 1.44Mb floppy drive
- Long life Lithium Ion (Lilon) flip-down battery
- Serial and parallel port
- MS DOS 6.22 and Windows for Workgroups 3.11 pre-installed
- Windows '95 ready
- Free Lotus Organizer
- Unique ultra-thin design
- Lightweight - just 2.1kg
- 3 year return to base warranty



**486DX2 50Mhz  
340Mb DSTN  
£2199**

**486DX2 50Mhz  
340Mb TFT  
£2899**

# IBM New colour ThinkPad

A new, entry-level colour portable to complement the existing mono ThinkPad 340

- Intel 486 SLC2 50Mhz processor
- 4Mb RAM expandable to 12Mb on planar board
- 9.4" Dual scan STN colour screen
- 200Mb hard disk drive
- 1.44Mb floppy drive
- Colour VGA standard display (will also provide VGA on external display)
- Serial port, parallel port
- Battery life 2.5 - 5 hours depending upon usage pattern
- Weight 2.38Kg
- Full IBM return to base worldwide warranty

**IBM  
ThinkPad 340CSE**

**£1349**



Model supplied will differ slightly in detail from this illustration. The ThinkPad 340CSE is too new to have a picture available.

LANTEC

These three pages show only a SMALL PART of the vast range of portable PCs supplied by LANTEC. We'll always try to beat any other advertiser's price too - so it's always worth giving our staff a quick call when shopping around. Remember also, that LANTEC DIRECT is a division of LANTEC Information Services Ltd., a BS EN ISO 9002:1994 Registered Firm. Buy in confidence from one of the UK's largest resellers of Personal Computers. Our name and thirteen year reputation are your guarantees of a great deal and the VERY BEST SERVICE.



Certificate No. FS22661

## The perfect companion to any portable PC The Hewlett-Packard DeskJet 320



- 3 pages per minute in mono
- Up to 7 minutes per page in colour (with optional colour kit)
- 600 x 300 DPI with Ret on plain paper (mono), 300DPI in colour
- 500 pages monthly usage
- Optional 60 sheet input tray
- 6 typefaces and 13 scaleable Windows fonts
- 1 year warranty included
- Warranty extendable to on-site with Hewlett-Packard SupportPack

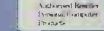
|   |      |
|---|------|
| HP DeskJet 320 .....                        | £169 |
| HP DeskJet 320 & Cut Sheet Feed .....       | £189 |
| HP SupportPack .....                        | £40  |
| HP DeskJet 320 Colour Kit .....             | £28  |
| HP DeskJet 320 Battery pack .....           | £25  |
| HP DeskJet 320 spare black cartridge .....  | £15  |
| HP DeskJet 320 spare colour cartridge ..... | £28  |

## The perfect place to start with professional quality printing The Hewlett-Packard DeskJet 540



- Up to 3 pages per minute in monochrome
- Up to 4 minutes per page in colour
- 600 x 300 DPI with Ret on plain paper (in mono), 300DPI in colour
- Built-in sheet feeder
- 3 years warranty
- Warranty extendable to on-site with Hewlett-Packard SupportPack

|   |      |
|---|------|
| HP DeskJet 540 .....                        | £209 |
| HP DeskJet 540 SupportPack .....            | £60  |
| HP DeskJet 540 spare black cartridge .....  | £15  |
| HP DeskJet 540 spare colour cartridge ..... | £28  |



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LANTEC DIRECT The portable PC company



# TIME DIRECT



Established for almost nine years, Time Direct is now one of the UK's leading suppliers for high quality branded products from the world's leading PC manufacturers.

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When you buy from Time Direct you also have the support and backing of the world's leading brands such as IBM, Toshiba, Hewlett-Packard, Intel,

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Notebooks are fast becoming the standard PC in the business and corporate environment. Our



sales staff are trained on the complete ranges of Toshiba, Compaq, IBM, Twinhead, Panasonic, Texas Instruments and Hewlett-Packard. We can fulfil all your notebook requirements including options such as the latest PCMCIA devices.

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## QUALITY SERVICE

Time Direct are one of very few direct resellers who are fully accredited by the British

Standards Institute for the ISO 9000 quality standard (BS 5750) we are certified to BS 5750 part 2 for the purchasing, configuration, sales,



installation and maintenance of computer systems. It is a testament to the quality of our service, the reliability of our products and our consistent value for money that the vast majority of our business comes from our existing customers.

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Our hardware technical support and software assistance services are in addition to any support provided by manufacturers and will enable you to quickly resolve any problems and remain productive.



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**01282 77 00 66**

Networking/Volume enquires Telephone 01282 77 00 99



## PRESARIO



Entry level excellent value for money systems with pre-loaded software and fitted soundcard & modem on 720 and 920 models

- 486SX-66 Processor
- 4Mb RAM or 8Mb RAM (920) expandable to 64Mb
- 200Mb or 420Mb Hard Disk
- 3.5" 1.44Mb floppy Drive
- Enhanced Local Bus SVGA Graphics with 1Mb RAM
- Desktop case (660 & 720) with 3 drive bays and 3 expansion slots
- Mini Tower Case (920) with 5 bays and 5 slots
- Serial parallel, joystick, MIDI and mouse ports
- 14" Low Radiation NI SVGA colour screen
- 16-bit stereo soundcard and internal 9600/2400 Fax/Data modem with telephone answering & CompuServe (720 & 920 models only)
- MS DOS 6.2, Windows 3.1, Tabworks, Welcome Centre, Control Centre and Learning Centre
- Microsoft Works v3, MS Publisher & Golf on 660 model (MS Works, MS Money and MS Entertainment Pack on 720/920)
- 3 year Compaq warranty

Model 660 486SX-33 200Mb ■164852-A22 £Call  
Model 720 486SX-66 420Mb ■171042-032 £Call  
Model 920MT 486SX-66 420Mb 8Mb ■171602-032 £Call

Please call for details of availability & pricing

**Options**  
4Mb Upgrade .....£160  
486SX-66 Upgrade .....£149  
DOS models .....£Call

**£CALL**

## PROLINEA



The new enhanced Compaq ProLinea provides excellent performance at truly remarkable prices.

- Intel 486SX-33, 486DX2-66 or 486DX4-100 processor
- Pentium technology upgradeable
- 128K external cache on DX4
- 4Mb RAM (8Mb on DX4) Upgradeable to 100Mb
- 200Mb, 340Mb or 525Mb hard disk
- 3.5" 1.44Mb floppy drive
- Enhanced Local Bus Graphics with 1Mb VRAM/Monitor
- options see below
- 3 drive bays and 3 free ISA slots
- Parallel port, mouse port & 2 serial ports
- Compaq keyboard & mouse
- Security & energy saving features
- DOS 6, Windows 3.1 Tabworks software
- 3 year Compaq warranty

4/33S 486SX-33 200Mb ■164552-A22 .....£641  
4/33S 486SX-33 340Mb ■171602-A23 .....£702  
4/66 486DX2-66 525Mb ■164652-A24 .....£1049  
4/100 486DX4-100 525Mb 8Mb ■164702-A24 .....£1178

**Options**  
Colossus 14" 0.28 SVGA NI LRL .....£149  
Compaq 14" SVGA Screen .....£239  
4Mb SMM Upgrade .....£160  
SX-33 to DX2-66 Upgrade .....£149

**£641**

## CONTURA AERO



The ideal subnotebook with mono or colour screens and PCMCIA. 40% smaller and 33% lighter!

- Intel 486SX-25 or 486SX-33 (SL versions)
- 4Mb RAM expandable to 12Mb
- 170 or 250Mb hard disk
- Includes FREE external 1.44Mb floppy drive
- 8" mono or 7.8" VGA colour screen
- PCMCIA 2.0 type II slot
- Serial, parallel & Compaq base ports
- MS DOS 6 & Windows 3.1
- Lotus Organizer & Winlink with cable
- Rechargeable NiMH battery, AC adaptor/charger & slipcase
- 3 year Compaq warranty

4/25 mono 250Mb .....£849  
4/33 colour 170Mb .....£1020  
4/33 colour 250Mb .....£1190

**Options**  
4Mb RAM module ■190532-001 .....£139  
Free PCMCIA modem .....£39  
Aero battery (DR19) ■190529-001 .....£82  
Car adaptor ■190530-001 .....£45

**£849**

## CONTURA 410



New 486DX2-50 model with mono, STN colour or TFT colour screens

- Intel 486DX2-50 processor
- 4Mb RAM upgradeable to 20Mb
- 3.5" 1.44Mb floppy drive
- 250Mb or 350Mb IDE hard disk
- SVGA Graphics with 1Mb Local Bus video
- VGA 9.5" TFT mono, 9.5" STN colour or 8.4" TFT colour screen
- 2 PCMCIA type II or one type III slot
- Parallel, serial & docking base ports (docking base)
- Includes other ports
- Powered by NiMH battery with upto 5 hour life, advanced power management or AC/power adaptor
- Status panel with 'dashboard' display
- Dimensions: 22.6cm x 5.1cm x 30.4cm. Weight 2.7Kg
- DOS 6, Microsoft Windows 3.1, Lotus Organizer & Tabworks
- Integral Compaq trackball mouse
- 3 year Compaq warranty

410 mono 250Mb ■189100-033 .....£1271  
410 STN 350Mb ■140100-034 .....£1696  
410 TFT 350Mb ■140200-034 .....£2206

**Options**  
4Mb RAM module ■147553-001 .....£178  
Docking base ■147519-031 .....£108  
Docking base with Ethernet ■147667-031 .....£163  
NiMH Battery ■190529-001 .....£85  
Intel PCMCIA modem .....£39

**£1271**

## CONTURA TFT



The amazing high quality Compaq Contura TFT colour notebook with Intel 486DX processor and excellent TFT screen. Simply the best buy!

- Intel 486DX-25 processor
- 4Mb RAM upgradeable to 20Mb
- 3.5" 1.44Mb floppy drive
- 120Mb or 209Mb IDE hard disk
- Superb 8.4" VGA TFT active matrix colour screen with 256 colours
- Parallel, mouse, serial, ext. keyboard and ext. SVGA ports
- Integral Compaq trackball mouse
- Powered by battery with advanced power management or AC/power adaptor
- Dimensions: 22.6cm x 4.8cm x 29.7cm. Weight 3Kg
- DOS 6 & Microsoft Windows 3.1 pre-loaded
- Compaq Tabworks Software
- 3 year Compaq warranty

4/25cx 120Mb TFT .....£1499  
4/25cx 209Mb TFT .....£1699  
4/25cx 340Mb TFT (check availability) .....£1899

FREE FAX / DATA MODEM

**Options**  
4Mb RAM module .....£146  
Compaq car adaptor .....£35  
NICAD battery .....£32

**£1499**

## LTE ELITE



The high performance colour notebook with built-in AC adaptor, PCMCIA and advanced docking facilities

- Intel 486DX2-40, DX2-50 or DX4-75 processor
- 4Mb RAM (8Mb DX2-50 & DX4)
- 3.5" 1.44Mb floppy drive
- 170Mb, 340Mb, 510Mb or 810Mb IDE hard disk
- SVGA Graphics with 1Mb Local Bus video
- 9.5" STN Dual Scan colour or 8.4"/9.5" TFT colour screen
- Two PCMCIA type II or one type III ports
- Parallel, serial, keyboard/mouse & docking base ports (docking base includes ports)
- Powered by battery with upto 5 hour life with advanced power management or Integral AC/power adaptor
- DOS 6 & Microsoft Windows 3.1
- Integral trackball mouse
- 3 year Compaq warranty

486DX2-40 Dual Scan 170Mb ■149700-032 .....£1781  
486DX2-40 TFT 8.4" 170Mb ■194000-032 .....£2036  
486DX2-40 TFT 8.4" 340Mb ■194000-035 .....£2206  
486DX2-50 TFT 9.5" 340Mb 8Mb ■197800-035 .....£2631  
486DX4-74 TFT 9.5" 340Mb 8Mb ■149500-035 .....£1971  
486DX4-75 TFT 9.5" 510Mb 8Mb ■149500-036 .....£3141  
486DX4-75 340Mb STN ■189850-035 .....£2376  
486DX4-75 510Mb STN ■189850-036 .....£2546  
486DX4-75 TFT CXL 510Mb ■197900-036 .....£3566  
486DX4-75 TFT CXL 810Mb ■197900-037 .....£3821

**Options**  
4Mb RAM module ■189013-001 .....£207  
Battery ■49729-001 .....£118  
Ministation Base Ethernet ■18570-031 .....£209  
SmartStation Base ■185600-031 .....£421  
Intel PCMCIA modem .....£39

**£1781**

TDR12A

All prices exclude delivery and VAT (17.5%). Delivery - Systems £19, Lasers and large items £15, software and small items £10. Visa / American Express / Switch and Government orders welcome. Prices, specifications and offers are subject to change and subject to our conditions of sale copies of which are available on request. Mail order only. No collections please. Goods are normally despatched within 7 days. All orders will be fulfilled within 28 days unless otherwise specified. E&OE

**THE DIRECT**

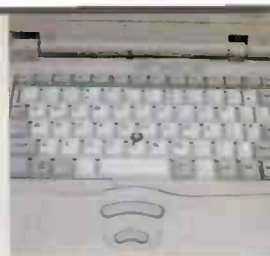
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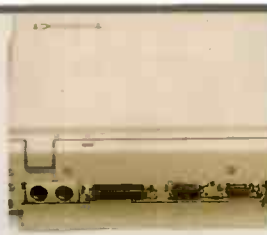




The new Microsoft Ballpoint V2.0 with Quickport is standard on many models (no cables!)



The easy to use integral Mousepoint on T4900, T2400, T3400, T2100 and T3600 models



All systems include standard ports (PS/2 mouse, external PS/2 keyboard parallel printer, serial and external SVGA ports.)



Port replicator (mini docking station) option is available for the T3400/T3600/T2400

## COMMON TOSHIBA FEATURES

Toshiba notebooks are unbeatable in terms of quality, advanced features, performance and ease of use. Do not consider a low quality clone-buy the best. The following common features are standard with all models:-

### SCREENS

Mono notebooks include a high quality sidelit Super Twist Nematic (STN) mono LCD capable of 64 grey scales and VGA resolution. STN colour portables utilise the latest advanced STN (Dual Scan) screens for enhanced contrast and faster response. Thin Film Transistor (TFT) or active matrix screens provide the best displays with 256 bright colours, ultra fast response and the ability to use motion video.

### KEYBOARD

Ergonomically designed 84 key full-size keys with 12 function keys and overlay numeric keypad. Dedicated cursor control keys.

### INTERFACES

Standard ports include centronics parallel, RS-232C serial, PS/2 ext. keyboard, PS/2 mouse and VGA/SVGA for ext. monitor. Either Quickport port with bundled Ballpoint mouse or Integral MousePoint device included. Other ports and PCMCIA details see individual notebook.

### POWER

Autosensing AC adaptor (100 to 240V) suitable for world wide usage provides power for notebook and recharges batteries. Removable rechargeable batteries are standard (type of battery and life varies as shown).

### SOFTWARE

Microsoft MS DOS 6.2 with Toshiba notebook enhancements, Windows 3.1 (Rel 3.11) or WFWG 3.11 are pre-loaded. CardWare PCMCIA support provides transparent use of PCMCIA cards without incompatibility problems and supports 'insertion'.

### SPECIAL FEATURES

Intel 3.3v SL technology with low power consumption. Reset button for warm reboot. AutoResume puts your systems in standby mode for up to 7 days. AutoSave automatically saves your data if your battery power is running out. LIM EMS/XMS/Hard RAM support. MaxTime Power Management can be set to switch off your disk drive, screen, keyboard and CPU after a certain time. Advanced Power Management is also supported.

Flash BIOS allows easy upgradeability in the future. Kensington Lock Provision for physical security. Password/MultiSafe security with various levels of protection.

## MONO 486SX-33



T1910

The ideal entry level mono 486 notebook with fast 33MHz processor, 200Mb hard disk and PCMCIA

- Intel 486SX-33 processor
- 4Mb RAM expandable to 20Mb
- 200Mb IDE hard disk
- 3.5" 1.44Mb floppy drive
- VGA (640 x 480) Graphics
- 9.5" STN LCD VGA mono screen with 64 grey scales
- 84 key keyboard and standard ports
- PCMCIA Rel 2.0 Type III or type II slot
- 11.8" x 8.4" x 2" with 2.9Kg (6.4lb) weight
- NiH2 battery (4 hours use)
- 12mth warranty extendable to 3 years
- Microsoft Ballpoint quickport mouse
- MSDOS 6.2 and Windows 3.1

T1910 200Mb ..... £846

#### Options

- 4Mb RAM (PA2012U) ..... £170
- 8Mb RAM (PA2013U) ..... £298
- 16Mb RAM (PA2014U) ..... £1339
- NiH2 Battery (PA2429UR) ..... £94

£846

## STN DS COLOUR 486SX-33



T1910CS

STN Dual Scan colour notebook with fast 33MHz processor, 200Mb hard disk and PCMCIA slot.

- Intel 486SX-33 processor
- 4Mb RAM expandable to 20Mb
- 200Mb IDE hard disk
- 3.5" 1.44Mb floppy drive
- VGA (640 x 480) Graphics
- 9.5" STN Dual Scan
- VGA colour screen
- 84 Key keyboard and standard ports
- PCMCIA Rel 2.0 Type III or type II slot
- 11.8" x 8.4" x 2.1" with 3.2Kg (6.9lb) weight
- NiH2 battery (3.5 hours use)
- 12m warranty extendable to 3 years
- Microsoft Ballpoint quick port mouse
- MS DOS 6.2 and Windows 3.1

#### Options

- 4Mb RAM (PA2012U) ..... £170
- 8Mb RAM (PA2013U) ..... £298
- 16Mb RAM (PA2014U) ..... £1339
- NiH2 Battery (PA2429UR) ..... £94

£1269

## TFT COLOUR 486DX2-50/DX4-75



T2450CT

High performance TFT colour notebooks with fast 486DX-75 processor, 8Mb RAM, 320Mb or 500Mb hard disk and multimedia options.

- Intel 486DX4-75 processor
- 8Mb RAM expandable to 24Mb
- 320Mb or 500Mb IDE hard disk
- 3.5" 1.44Mb floppy drive
- VESA Local Bus
- VGA/SVGA Graphics
- 1Mb video RAM and Graphics Accelerator
- 9.5" TFT VGA colour screen
- 84 Key keyboard and Integral MousePoint device
- Standard ports, SCSI-2 ports and 120 pin replicator port (for mini-docking station)
- Sound card port for portable soundcard
- PCMCIA Rel 2.0 slots (one type III and one type II)
- 11.8" x 8.4" x 2.1" with 3.2Kg (6.9lb) weight
- 32KHz battery (3.5 hours use)
- 3 year warranty
- MS DOS 6.2 and Windows 3.11 for Workgroups

T2450 CT 320Mb ..... £2851

T2450 CT 500Mb ..... £3059

#### Options

- 4Mb RAM (PA2019U) ..... £192
- 8Mb RAM (PA2020U) ..... £340
- 16Mb RAM (PA2021U) ..... £1146
- NiH2 Battery (PA2429UR) ..... £94
- Soundcard (PA2807U) ..... £102

£2851

## TFT COLOUR 486DX-33



T4600CT/T4700CT

TFT colour 486 notebook with 486DX-33 or DX2-50 processor, 320Mb hard disk, large TFT screen and Deskstation IV option.

- Intel 486DX-33 or DX2-50 processor
- 4Mb or 8Mb RAM expandable to 20Mb
- 320Mb IDE hard disks
- Internal 3.5" 1.44Mb floppy drive
- VGA/SVGA Graphics
- 9.5" TFT VGA colour screen
- 84 key keyboard and standard ports
- Toshiba memory slot
- Deskstation IV docking station compatible (shown)
- PCMCIA Rel 2.0 slots (one type III and one type II)
- 11.7" x 8.3" x 2.0" with 3.3Kg (7.3lb) weight
- NiH2 battery (3.5 hours use)
- Quick read LCD panel display
- 3 year Toshiba warranty
- Microsoft Ballpoint quick port mouse
- MS DOS 6.2 and Windows 3.11 for Workgroups
- Microsoft Sound system with software and built-in microphone and speaker (on T4700CT)

T4600/320 320Mb 486DX-33 4Mb ..... £2379

T4700CT 320Mb 486DX2-50 8Mb ..... £2719

#### Options

- 4Mb RAM (PA2012U) ..... £170
- 8Mb RAM (PA2013U) ..... £298
- 16Mb RAM (PA2014U) ..... £1339
- NiH2 Battery (PA2413R) ..... £119
- DeskStation IV ..... £374

£2379

## TFT 2150 CDS



TC2150

The ultimate data storage device with built-in full size CD-ROM drive and upto 520Mb hard disk plus soundblaster quality sound

- Intel DX4-75 processor
- 4Mb RAM (8Mb on TFT) expandable to 28Mb (32Mb on TFT)
- Built-in 5.25" IDE CD-ROM
- 260Mb or 520Mb IDE hard disks
- External 3.5" 1.44Mb floppy drive
- VESA Local Bus VGA/SVGA Graphics
- 10.4" dual scan or TFT colour screen
- 84 key keyboard and integrated mousepoint device
- Soundblaster compatible sound system
- Microsoft Sound system with software and built-in microphone and speaker
- Built-in AC adaptor
- 11.8" x 8.3" x 2.0" with 3.35Kg (7.3lb) weight
- PCMCIA Rel 2.0 slots (two type II or one type III)
- MS DOS 6.2, MS Windows 3.11 for workgroups, Soundblaster pro and built-in microphone
- 3 year warranty

T2150 CDS 260Mb dual scan 4Mb ..... £2291

T2150 CDS 520Mb dual scan 4Mb ..... £2546

T2150 CDT 520Mb TFT 8Mb ..... £3396

#### Options

- 4Mb RAM (PA2028U) ..... £215
- 8Mb RAM (PA2027U) ..... £385
- 16Mb RAM (PA2026U) ..... £1195
- Port Replicator (PA2708U) ..... £128
- Battery (PA2437U) ..... £96
- Battery charger (PA2438U) ..... £149

£2291

# TOSHIBA





Two PCMCIA slots on many models provide ultimate expansion. Intel fax/data modem at an incredible £99



Built-in Microsoft Sound System on T4700, T4800 T4850, T4900 and T6600 lets you record live



QuickRead 'Dashboard' LCD icons display on many models shows the status of your PC



Deskstation IV turns your T4600, T4700, T4800, T4850 and T4900 notebooks into expandable desktop systems

## T2100



### T2100

The new entry level notebook with fast 486DX2-50 processor, 260Mb or 350Mb drives and a range of screens

- Intel 486DX2-50 processor
- 4Mb RAM (8Mb on TFT) expandable to 20Mb (32Mb on TFT)
- 260Mb or 350Mb hard disks
- 3.5" 1.44Mb floppy drive
- VESA Local Bus VGA/SVGA Graphics
- 9.5" Mono, 10.4" Dual Scan colour or 8.4" TFT colour screen
- 84 Key keyboard and Integral MousePoint device
- PCMCIA Rel 2.0 slots (one type III or two type II)
- 11.8" x 8.9" x 1.9" with 3.2Kg (7lb) weight
- NIH2 battery (4.5 hours use)
- MS DOS 6.2, MS Windows 3.11
- 1 year warranty
- Built-in AC adaptor

|                         |       |
|-------------------------|-------|
| T2100 260Mb mono        | £1016 |
| T2100CS 350Mb dual scan | £1611 |
| T2100CT 350Mb TFT       | £2206 |

#### Options

|                           |       |
|---------------------------|-------|
| 4Mb RAM (PA2026U)         | £215  |
| 8Mb RAM (PA2027U)         | £365  |
| 15Mb RAM (PA2028U)        | £1195 |
| Port Replicator (PA2708U) | £128  |
| Battery (PA2437U)         | £36   |
| Battery charger (PA2438U) | £149  |

**£1016**

## TFT COLOUR SUBNOTE



### T3600CT

Superb TFT colour ultra notebook with fast 486DX2-50 processor, 8Mb RAM, 250Mb hard disk, and just 2Kg Weight

- Intel DX2-50 processor
- 8Mb RAM expandable to 20Mb
- 250Mb IDE hard disks
- VGA/SVGA VESA Local Bus Graphics
- 1Mb video RAM and Graphics Accelerator
- 8.4" TFT VGA colour screen
- 84 Key keyboard and Integral MousePoint device
- Parallel, serial, 72 pin replicator and single SIMM
- memory ports
- Port replicator (Mini-Docking Station) option with standard Ports
- PCMCIA Rel 2.0 Type II slot 9.8" x 7.9" x 1.8" with 2.0Kg (4.4lb) weight
- Lithium Ion battery (4 hours use)
- 3 year Toshiba Warranty
- MS DOS 6.2 and Windows 3.11 for Workgroups

#### Options

|                             |       |
|-----------------------------|-------|
| 4Mb RAM (PA2019U)           | £192  |
| 8Mb RAM (PA2020U)           | £340  |
| 15Mb RAM (PA2021U)          | £1148 |
| Li Ion Battery (PA2814U)    | £175  |
| External 3.5" FDD (PA2806R) | £128  |

**£2631**

## TFT COLOUR 486DX2-40



### T1950CT

High performance TFT Colour 486 Notebook with 486DX2-40 processor, 200Mb hard disks and VESA Local Bus graphics

- Intel 486DX2-40 processor
- 4Mb RAM expandable to 20Mb
- 200Mb IDE hard disk
- 3.5" 1.44Mb floppy drive
- VGA/SVGA VESA Local Bus Graphics
- 1Mb video RAM and Graphics Accelerator
- 8.4" TFT VGA colour screen
- 84 key keyboard and standard ports
- PCMCIA Rel 2.0 Type III or type II Slot
- 11.8" x 8.4" x 2.1" with 3.2Kg (6.9lb) weight
- NIH2 battery (4 hours use)
- 12mth warranty extendable to 3 years
- Microsoft Ballpoint Quickport mouse
- MS DOS 6.2 and Windows 3.1

#### Options

|                        |       |
|------------------------|-------|
| 4Mb RAM (PA2012U)      | £170  |
| 8Mb RAM (PA2013U)      | £298  |
| 15Mb RAM (PA2014U)     | £1339 |
| NIH2 Battery (PA2430U) | £81   |

**£1866**

## TFT COLOUR 486DX4-75 & PENTIUM



### T4850/T4900 CT

486DX4-75 or Pentium 75 (T4900) TFT colour notebook with 500Mb or 810Mb hard disks, 8Mb RAM, integrated multimedia and Deskstation IV option

- Intel 486DX4-75 (T4850) or Pentium 75 (T4900) processor
- 8Mb RAM expandable to 40Mb
- 500Mb (T4850) or 810Mb (T4900) IDE hard disk
- 3.5" 1.44Mb floppy drive
- VESA Local Bus VGA/SVGA Graphics
- 1Mb Video RAM and Graphics Accelerator
- 10.4" TFT (65K Colour) screen on T4850/T4900
- 84 key keyboard and standard ports
- Toshiba memory slot ports
- Microsoft Sound system with software and built-in microphone and speaker
- Deskstation IV docking station compatible
- PCMCIA Rel 2.0 slots (one type III and one type II)
- 11.7" x 8.3" x 2.2" with 3.1Kg (6.8lb) weight
- NIH2 battery (3.5 hours use)
- Quick read LCD panel display
- 3 year Toshiba warranty
- Microsoft Ballpoint mouse or Mousepoint (T4900)
- MSDOS 6.2 and Windows 3.11 for Workgroups

|                              |       |
|------------------------------|-------|
| T4850CT 10.4" TFT            | £3821 |
| T4900CT Pentium 75 10.4" TFT | £4586 |

#### Options (T4850/T4850)

|                        |       |
|------------------------|-------|
| 4Mb RAM (PA2012U)      | £170  |
| 8Mb RAM (PA2013U)      | £298  |
| 15Mb RAM (PA2014U)     | £1339 |
| NIH2 Battery (PA2430U) | £81   |
| DeskStation IV         | £374  |

**£3821**

## TFT COLOUR PORTABLE



### T6600C

486DX2-66 TFT Colour Power Portable with 5.25" bay, 2 expansion slots, 510Mb hard disks, 8Mb RAM, Large 10.5" TFT Screen and integrated multimedia

- Intel 486DX2-66 processor
- 8Mb RAM expandable to 40Mb
- 510Mb IDE hard disk
- 3.5" 1.44Mb floppy drive
- VGA/SVGA Graphics
- 10.5" TFT VGA colour screen
- 102 key detachable keyboard with full size keypad and 12 function keys
- Standard Ports, SCSI and Toshiba memory slot ports
- Microsoft Sound system with software with two integral speakers and bundled Microphone
- Free 5.25" drive bay and 2 16-bit full-size expansion slots
- PCMCIA Rel 2.0 slots type III slot
- 15.4" x 12.6" x 4.7" with 7.8Kg (17.1lb) Weight
- Auto sensing AC adaptor (100 to 240v). Mains powered only
- 3 year Toshiba warranty
- MSDOS 6.2, Windows 3.11 for Workgroups, Ez SCSI and Logitech Mouse

#### Options

|                    |       |
|--------------------|-------|
| 4Mb RAM (PA2004U)  | £149  |
| 8Mb RAM (PA2005U)  | £277  |
| 15Mb RAM (PA2010U) | £1148 |

**£4095**

## TOSHIBA OPTIONS

- External Battery Charger:**
- T3400/T3600 (PA282U) £166
  - Others (PA2422U-E) £107

#### ExtraUniversal AC Adaptor:

- T1910, T1950, T4700, T4800 (PA2478U) £56
- T2400 (PA2430U) £48
- T4600 (PA2411U) £48
- T3400, T3600 (PA2426U-E) £48

#### Toshiba PCMCIAcards:

- PCMCIA 14.4 modem (TPCV32BFUK) £255
- PCMCIA ethernet adaptor (PCE-10BC) £192
- PCMCIA V34 Modem £332

#### Other Options:

- Carry case T6600C (T239L) £39
- Carry case others (T202L) £34
- Ballpoint Quickport mouse (PA2805U) £73
- Portable SCSI CD ROM (HR-CD400) £306
- CD-ROM requires PCMCIA SCSI adaptor on most notebooks (just SCSI to SCSI D Cable on T2400)
- Deskstation IV £374 (Docking station for T4600, T4700 and T4800 models. It includes all standard ports, two full-size 16-bit slots, 5.25" drive bay, power supply and monitor stand).

## THIRD PARTY OPTIONS

### PCMCIA Options

- Intel 2496 Fax/data Modem £99
- New media Bus Toaster SCSI Adapter £173
- New Media Visual SCSI adaptor £149
- New Media 16-bit Soundcard £196
- New Media Combo Ethernet Card £125
- MiniStore 130Mb hard drive £399

### Parallel Port Devices

- Backpack DS CD-ROM Drive £299
- Backpack 5.25" floppy drive £149
- Logitech Scanman Easytouch Scanner £142
- Trakker 250Mb Tape backup £208

### Keyboards & Mice

- External COL 130 key keyboard (needs PS/2 adaptor) £29
- PS/2 to DIN keyboard adaptor £9
- Microsoft Natural keyboard £69
- IMSI PC Stylus PS/2 £29
- IMSI Mini Thumball £24
- Logitech Trackman Portable £32

### Portable Printers

- HP DeskJet 320 £175
- Canon BJ10ax £141

### Other Options:

- Universal third party car adaptor £99
- Laplink XL & serial cable £39
- Laplink Pro v5 for Win £74
- Time external speakers £18

TDR13A

All prices exclude delivery and VAT (17.5%). Delivery:- Systems £19, Lasers and large items £15, software and small items £10. Visa /Access/ American Express /Switch and Government orders welcome. Prices, specifications and offers are subject to change and subject to our conditions of sale copies of which are available on request. Mail order only. No collections please. Goods are normally despatched within 7 days. All orders will be fulfilled within 28 days unless otherwise specified. E&OE.



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The keyboard flips up with easy access to memory slot, batteries, floppy drive and hard disks, all of which are removable on 360 & 755 models



Port Replicators I & II (mini-docking stations) provide standard ports and cable convenience (Replicator I also has additional PCMCIA III or two type II slots.)



The unique easy to use TrackPoint II or III pointing device provides better cursor control than any mouse. Equally good for right & left handers.



Portable Dock I has standard ports, SCSI, Speakers, one ISA slot, one 5.25" drive bay (suitable for CD-ROM) and a handle. Shown with ThinkPad attached

## COMMON THINKPAD FEATURES

The IBM ThinkPad range of notebooks are the most advanced notebooks money can buy. In terms of quality, innovation, useability and technology, these systems are way ahead of the competition.

### CASE

Elegant yet robust case made from special carbon fibre re-inforced plastic for extra durability, yet incredible light weight. The ThinkPad 340 is only 2.2Kg!

### TRACKPOINT

IBM's innovative red device situated in the middle of the keyboard has no moving parts and responds naturally to your finger's pressure. Easier to use than any mouse or trackball!

### SCREENS

High quality screens open to 180 degrees and feature edge to edge display with contrast and brightness control.

-Mono screen available on the 340 and 360 provide a high quality Mono STN LCD capable of 64 grey scales and VGA resolution.  
-STN colour screens on some 360 & 755 models provide 9.5" diagonal, 256 colours and utilise the latest advanced sidelit STN (Dual Scan) technology for enhanced contrast and faster response.  
-TFT or active matrix screens (8.4" on 360; 10.4" on 755) provide the best displays with 256 bright colours, ultra fast response and the ability to use motion video.

-New Black Matrix on array 10.4" TFT colour screens on 755CE & 755CD reduce glare, give the brightest and clearest display and 65 thousand colours.

### GRAPHICS

All 360 & 755 models include VESA Local Bus graphics with 1Mb RAM and Windows accelerator. Simultaneous display to external SVGA screen.

### MODULAR DESIGN

All models except 340 allow removable hard disk (170Mb to 810Mb), floppy drive and battery. The keyboard easily flips up for access.

### KEYBOARD

Ergonomically designed, quiet, 85 key full-size keys with 12 function keys and overlay numeric keypad.

### INTERFACES

Standard ports include enhanced centronics parallel, RS-232C serial, PS/2 ext. keyboard/mouse and SVGA for external monitor. One type III PCMCIA slot (also functions as two type II on 360/755 or one type II on 340).

### POWER & MANAGEMENT

Powerful rechargeable batteries coupled with Advanced Power Management and non-disruptive battery exchange allow you to work a whole day without being near a powerpoint. Fuel gauge provides an indicator of battery life. AC adaptor provides power for notebook and recharges batteries with quick charge facility

(1.5 hours). Minimum battery life figure shown is for full use whilst top figure is for typical use with power management.

### SECURITY

Hard disk is removable (except 340) and lockable in the computer and can be protected by a password. Kensington Cable Lock Provision and security loop for physical security. Just send in the registration card to IBM for engraved nameplate personalised for you or your company.

### SOFTWARE

IBM PC DOS 6.3, Windows 3.1 plus additional software as shown. Various utilities including PC Card Director with Auto Configuration, Hot PCMCIA insertion (Easy Playing) and Automatic Memory Device Driver.

### DOCKING OPTIONS

360 & 755 models have ability to use 4 docking stations; port replicator 1 for economical expansion and cable management, replicator 2 also has additional PCMCIA slots. Portable Dock 1 and larger Dock 2 full size docking stations provide extra drive bays and expansion slots and room for multimedia options in addition to port replication. Intelligent software allows docking when your system is on!

### IBM SERVICE & SUPPORT

12mth IBM HelpWare hotline support, 12mth warranty with 3 year warranty on 755 models.

## WHICH THINKPAD IS FOR YOU?

### ThinkPad 340

The low cost budget ThinkPad with mono or colour screen and 125Mb or 200Mb hard disk. ThinkPad quality but limited expansion and modularity. Ideal for home and small business use.

### ThinkPad 360

All the modularity, expansion capability, security and versatility of the ThinkPad range with a wide choice of screens, hard drives, processors and docking facilities. Ideal for the corporate sales team, fleet use and other general business requirements.

### ThinkPad 755

All the features of the ThinkPad 360 plus multimedia sound, larger screens and faster processors. Ideal for presentations and business uses where performance is important.

### ThinkPad 755CE & 755CD

The ultimate mobile computers with innovative technology, the world's best BMA TFT screen, 100Mhz processor, full-feature multimedia and modem facilities, and InfraRed communications. Ideal for the top executive. Treat yourself to the best money can buy!

## THINKPAD 340



486-50

The ideal entry level 486 notebook with fast 50MHz processor, 125Mb/200Mb hard disk, PCMCIA and IBM ThinkPad quality

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>Fast IBM 486SLC2-50 processor</li> <li>16K internal CPU Cache</li> <li>4Mb RAM expandable to 12Mb</li> <li>125Mb (or 200Mb) IDE fixed hard disk</li> <li>3.5" 1.44Mb floppy drive</li> <li>VGA (640 x 480) Graphics</li> <li>9.5" STN LCD VGA mono or 9.4" STN colour screen</li> <li>85 key keyboard and</li> </ul> | <ul style="list-style-type: none"> <li>Standard Ports</li> <li>PCMCIA Rel 2.0 Type III Slot (or one type II)</li> <li>48mm x 297mm x 210mm with 2.2Kg Weight</li> <li>NICAD battery (NIMH-A on DS1)</li> <li>12mth warranty extendable to 3 years</li> <li>Integral Trackpoint II pointing device</li> <li>PC DOS 6.3, Windows 3.1 &amp; Utilities</li> </ul> |
| TP 340 Model M01 125Mb .....  | £399  |
| TP 340 Model DS1 200Mb .....  | £1337   |
| <b>Options</b>  |   |
| 4Mb RAM (TOMPM08) .....   | £106  |
| 8Mb RAM (TOMPM08) .....   | £369  |
| NICAD battery (MTOBP340) .....  | £141  |
| AC adaptor (MTOACUKE) .....   | £36   |
| NIMH battery (DS1) (MTOBPMH) .....  | £63   |
| AC adaptor (DS1) (MTOACUKE) .....   | £36   |

**£899**

## THINKPAD 755

### Common Features

ThinkPad 755 range is available with a range of processors, large 9.5" Dual Scan or 10.4" TFT colour screens, various hard disks and software pre-loads. All systems have a modular design with multimedia capability included as standard.

All the features of the 360 are included such as Trackpoint II, lightweight design and built-in modularity.

- 4Mb or 8Mb base RAM expandable to 20Mb using one 4, 8 or 16Mb IC DRAM card or 36Mb/40Mb (using DIMM adaptor which provides two slots, which can be fitted with two 16Mb DIMM modules)
- Removable 3.5" 1.44Mb floppy drive (to reduce weight)
- VESA Local Bus Graphics with 1Mb RAM, Windows Accelerator and Dual VGA support for external SVGA display (256 colours at 1024 x 768)
- 85 key keyboard which flips open to provide access to battery, removable hard disk and floppy bays
- Standard ports include enhanced parallel, serial, PS/2 for mouse or keyboard
- PCMCIA type III slot (can be used as two type II slots)
- Soundcard is included as standard
- Expansion bus port for dock 1, dock 2, port replicator 1 and port replicator 2
- Sizes, weights, battery (NIMH) life vary as shown

755CE and 755CD include 486DX4-100 processor, 8Mb base RAM, extra multimedia/modem features, Trackpoint III, Black Matrix on array TFT screens, motion video support, infra-red comms, and 5.25" CD on 755CD model

### Popular 755 Options

|  |       |
|--|-------|
| 2Mb DRAM (35G214) .....                          | £117  |
| 4Mb DRAM (35G215) .....                          | £203  |
| 8Mb DRAM (35G216) .....                          | £405  |
| 16Mb DRAM (86G574) .....                         | £1031 |
| DIMM Adaptor (provides 2 slots) (MTOHMACP) ..... | £72   |
| 4Mb DIMM (TOMMD04) .....                         | £203  |
| 8Mb DIMM (TOMMD08) .....                         | £399  |
| 16Mb DIMM (TOMMD16) .....                        | £1031 |
| 300 NIMH Battery .....                           | £36   |
| 750 NIMH Battery .....                           | £135  |
| 750 Battery Safety Cover .....                   | £12   |
| NIMH Battery Pack II (755CE/CD) (MTOBATII) ..... | £117  |

Other options: See General Options

## 486DX2-50/DX4-75 DS COLOUR



### ThinkPad 755CS

Powerful Dual Scan colour ThinkPad 755 models with 486DX2-50 or 486DX4-75 processor and a range of hard disks. (shown with portable Dock 1 & CD ROM options)

General specification as shown under common features

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>4Mb RAM upgradeable to 36Mb</li> <li>9.5" STN Dual Scan colour display with 256 colours and 20:1 contrast ratio</li> <li>170Mb, 340Mb or 540Mb removable hard disks</li> <li>51h x 297w x 210d in mm</li> </ul> | <ul style="list-style-type: none"> <li>2.8Kg weight with battery &amp; drives</li> <li>IBM PC DOS 6.3, Windows 3.1, Lotus Organizer &amp; PC Card Director</li> <li>Battery life 4 to 8 hours</li> <li>Built-in soundcard with audio jacks, microphone and speaker</li> <li>IBM 3 year warranty</li> </ul> |
| 755CS DS1 486DX2-50 170Mb .....  | £2205  |
| 755CS DS2 486DX2-50 340Mb .....  | £2354  |
| 755CS DS3 486DX4-75 340Mb .....  | £2943  |
| 755CS DS6 486DX4-75 340Mb .....  | £3236  |

**£2205**

## 486DX2-50/DX4-75 TFT COLOUR



### ThinkPad 755C

Powerful TFT colour ThinkPad 755 models with 486DX2-50 or 486DX4-75 Processor and a range of hard disks. (shown with Dock 2 & matching keyboard options)

General specification as shown under common features

|  |   |
|--|---|
| <ul style="list-style-type: none"> <li>4Mb RAM upgradeable to 36Mb</li> <li>10.4" TFT colour display with 256 colours and 100:1 contrast ratio</li> <li>170Mb, 340Mb, 540Mb or 810Mb removable hard disks</li> </ul> | <ul style="list-style-type: none"> <li>51h x 297w x 210d in mm</li> <li>2.9Kg weight with battery &amp; drives</li> <li>IBM PC DOS 6.3, Windows 3.1, Lotus Organizer &amp; PC Card Director</li> <li>Battery life 3.1 to 8 hours</li> <li>Built-in soundcard with audio jacks, microphone and speaker</li> <li>IBM 3 year warranty</li> </ul> |
| 755C TF1 486DX2-50 170Mb .....   | £2574   |
| 755C TF2 486DX2-50 340Mb .....   | £2723   |
| 755C TF4 486DX4-75 170Mb .....   | £3164   |
| 755C TF5 486DX4-75 340Mb .....   | £3312   |
| 755C TF6 486DX4-75 540Mb .....   | £3605   |
| 755C TF6 486DX4-75 810Mb .....   | £4048   |

**£2574**

# IBM ThinkPad





Matching black monitor and black keyboard are available to complement your IBM ThinkPad. Shown with monitor stand and Dock 2 (2 ISA slots, 2 bays & PCMCIA slots).



Various nylon and leather cases are available for ThinkPad and Portable Dock I.



A plethora of high quality multimedia, comms & productivity software for the mobile professional comes pre-loaded on many models.



The Communicate Connexion 1440C PCMCIA type II fax/data modem attaches to the Motorola Micro TAC II mobile phone (and others e.g. BT Pearl, Voda: VP130, Ford Compact).

## THINKPAD 360

### Common Features

ThinkPad 360 Range is available with a range of Processors, Screens, Hard Disks and Software Pre-loads. All systems have a modular design and full docking capabilities

- Standard Thinkpad features such as Trackpoint II, lightweight design and built-in modularity
- 4Mb base RAM expandable to 20Mb using one 4, 8 or 16Mb IC DRAM card (fits into memory slot)
- Removable 3.5" 1.44Mb floppy drive (to reduce weight)
- VESA Local Bus graphics with 1Mb RAM, Windows Accelerator and Dual VGA support for external SVGA display (256 colours at 1024 x 768)
- 85 key keyboard which flips open to provide access to battery, removable hard disk and floppy bays.
- Standard ports include enhanced parallel, serial, PS/2 for mouse or keyboard (adaptor allows use of both)
- PCMCIA type III slot (can be used as two type II slots)
- Soundcard port for optional soundcard (only to special order - factory fitted)
- Expansion bus port for dock 1, dock 2, port replicator 1 and port replicator 2
- Sizes, weights, battery (NiMH) life vary as shown
- Pen model is also available

#### Popular 360 Options

|                                   |      |
|-----------------------------------|------|
| 4Mb RAM (TOMP404)                 | £136 |
| 8Mb RAM (TOMP408)                 | £368 |
| 16Mb RAM (TOMP416)                | £323 |
| 360 NiMH battery #B6G2846         | £135 |
| 750 NiMH battery #B6G2846         | £135 |
| 750 battery safety cover #B6G2007 | £12  |

Other options: See General Options

## MONO/DUAL SCAN COLOUR



### ThinkPad 360/360CS/CSE

Popular mono or Dual Scan colour ThinkPad 360 models with 486SX-33 or 486DX2-50 processor and a range of hard disks. Shown with optional modem & mobile phone

- General specification as shown under common features
- 4Mb RAM upgradeable to 20Mb
- 9.5" STN Dual Scan colour display with 256 colours and 20:1 contrast ratio
- Mono model has 9.6" STN LCD monochrome display with 64 grey scales and 18:1 contrast ratio
- 170Mb or 340Mb removable hard disks
- 51h x 297w x 210d in mm
- 2.8Kg weight with battery & drives
- IBM PC DOS 6.3, Windows 3.1 & PC Card Director
- Lotus Organizer, Lotus ScreenCam, Lotus cc:Mail Mobile, OAG FlightDisk, Triton CoSession Host (Organizer only with 486SX-33 Models)
- Battery life 3 to 10 hours

|                           |       |
|---------------------------|-------|
| <b>Mono</b>               |       |
| 360 M01 486SX-33 170Mb    | £1067 |
| 360 M02 486SX-33 340Mb    | £1215 |
| <b>Dual Scan Colour</b>   |       |
| 360CS D01 486SX-33 170Mb  | £1173 |
| 360CS D02 486SX-33 340Mb  | £1322 |
| 360CS D03 486DX2-50 170Mb | £1949 |
| 360CS D04 486DX2-50 340Mb | £2097 |

**£1067**

## TFT COLOUR



### ThinkPad 360/360CE

Superb TFT Colour ThinkPad 360 models with 486SX-33 or 486DX2-50 Processor and a range of hard disks

- General specification as shown under common features
- 4Mb RAM upgradeable to 20Mb
- 8.4" TFT active matrix colour display with 256 colours and 100:1 contrast ratio
- 170Mb or 340Mb removable hard disks
- 47h x 297w x 210d in mm
- 2.8Kg weight with battery & drives
- IBM PC DOS 6.3, Windows 3.1 & PC Card Director
- Lotus Organizer, Lotus ScreenCam, Lotus cc:Mail Mobile, OAG FlightDisk, Triton CoSession Host (Organizer only with 486SX-33 Models)
- Battery life 3.2 to 7 hours

|                          |       |
|--------------------------|-------|
| 360C T01 486SX-33 170Mb  | £1508 |
| 360C T02 486SX-33 340Mb  | £1656 |
| 360CE T03 486DX-50 170Mb | £1949 |
| 360CE T04 486DX-50 340Mb | £2097 |

**£1508**

## 486DX4-100 BMA TFT COLOUR



### ThinkPad 755CE

Powerful TFT colour notebook with 486DX4-100 processor, large TFT BMA screen, Advanced Multimedia/Modem and Infra-red Comms

- General specification as shown under common features
- 8Mb RAM upgradeable to 40Mb
- 10.4" TFT Black Matrix on array colour display with 65,000 colours, reduced glare and excellent visibility even in daylight. 100:1 contrast ratio
- Trackpoint III pointing device with improved rubber grip and drag & drop features
- 340Mb, 540Mb or 810Mb removable hard disks
- 50h x 297w x 210d in mm; 2.9Kg weight with battery & drives
- IBM PC DOS 6.3, Windows 3.1, & PC Card Director
- Software Suite including Lotus Organizer 1.1, ScreenCam, cc:Mail Mobile, Audiofile TalkWorks, Asymetrix Presentation PE, Puma TranXit, OAG FlightDisk, Video for Windows runtime
- Built-in 16-bit soundcard with audio jacks, headphone jack, microphone and speaker
- Battery life 3.5 to 7 hours
- Built-in IRDA compatible Infra-red ports
- Integrated Mwave DSP unit which can function as stereo soundcard with WAV & MIDI support, audio compression or integrated 14.4 data/fax modem with Telephony support (Speaker phone or Telephone answering)

|                            |       |
|----------------------------|-------|
| 755CE C02 486DX4-100 340Mb | £3902 |
| 755CE C03 486DX4-100 540Mb | £4194 |
| 755CE C04 486DX4-100 810Mb | £4635 |

**£3902**

## 486DX4-100 BMA TFT COLOUR & MPC2



### ThinkPad 755CD

Ultimate TFT colour fully MPC2 compliant multimedia notebook with 486DX4-100 processor, Large TFT BMA screen, advanced stereo multimedia/modem, built-in CD ROM, and Infra-red Comms

- General specification as shown under common features
- 8Mb RAM upgradeable to 40Mb
- 10.4" TFT Black Matrix on array colour display with 65,000 colours, reduced glare and excellent visibility even in day light. 100:1 contrast ratio
- Trackpoint III pointing device with Improved rubber grip and drag & drop features
- 540Mb or 810Mb removable hard disks
- 57h x 297w x 210d in mm; 2.9Kg weight with battery & drives
- IBM PC DOS 6.3, Windows 3.1, & PC Card Director
- Software Suite including Lotus Organizer 1.1, ScreenCam, cc:Mail Mobile, Audiofile TalkWorks, Asymetrix Presentation PE & Digital Video Producer, Puma TranXit, OAG flightDisk, Video for Windows runtime
- Built-in soundcard with audio jacks, headphone jack, MIDI/Joystick port, microphone and stereospeakers
- Video capture/overlay features and Composite (video) in; video out to TV ports
- Battery life 3.5 to 7 hours
- Built-in IRDA compatible InfraRed ports
- Integrated Mwave DSP unit which can function as stereo soundcard with WAV & MIDI support, audio compression or integrated 14.4 data/fax modem with Telephony support (speaker phone or telephone answering)
- Built-in 5.25" double speed multi-session CD-ROM Drive

|                            |       |
|----------------------------|-------|
| 755CD C03 486DX4-100 540Mb | £5333 |
| 755CD C04 486DX4-100 810Mb | £5774 |

**£5333**

## GENERAL OPTIONS

### Additional Removable

#### Hard Drives

|       |       |
|-------|-------|
| 170Mb | £441  |
| 340Mb | £590  |
| 540Mb | £882  |
| 810Mb | £1323 |

#### Carry Cases

|                                   |      |
|-----------------------------------|------|
| Deluxe leather overnight #B130922 | £176 |
| Deluxe leather #B130921           | £104 |
| Deluxe nylon #B75F0961            | £72  |
| Nylon #B7G1530                    | £38  |

### PCMCIA type II Cards

|                             |      |
|-----------------------------|------|
| Intel fax/data modem        | £99  |
| Communicate Connexion 1440C | £Caf |

#### IBM PCMCIA options

|                         |      |
|-------------------------|------|
| 3270 Card               | £269 |
| -14.4 fax/data modem    | £324 |
| Modern UK DAA for above | £83  |
| -164 Token Ring card    | £380 |
| -10Base2 Ethernet card  | £180 |
| -10BaseT Ethernet card  | £180 |

### Black Matching Extras

|                           |      |
|---------------------------|------|
| Black 15X FST SVGA screen | £432 |
| Black external keyboard   | £140 |
| Black Keypad for keyboard | £45  |
| Black mouse               | £30  |

### Other Options

|                                      |      |
|--------------------------------------|------|
| Keyboard/mouse connector cable       | £23  |
| KeyGuard                             | £63  |
| Numeric keypad                       | £22  |
| AC adaptor 40W                       | £48  |
| AC adaptor 50W                       | £108 |
| Car battery adaptor                  | £48  |
| Quick charger (can take 2 batteries) | £176 |

### Docking Options (360 & 755)

|   |      |
|---|------|
| Port Replicator 1 #B6G3515  | £198 |
| Port Replicator 2 #B6G3530  | £72  |
| Portable Dock I #B3G9721  | £336 |
| includes 5.25" bay, one ISA slot, one special slot for A to D adapter for motion video, two integral speakers |      |
| SCSI port, and standard ports   |      |
| Dock I carry case #B6G3585  | £77  |
| Dock I display stand #B6G3517   | £77  |
| Ext. floppy enclosure #B6G3587  | £32  |
| Dock I CD-ROM kit #B6G3506  | £144 |
| Dock I Anal. to Digit. video card #B6G3509  | £563 |
| Dock I audio cable #B6G3521   | £18  |
| Dock I SCSI install kit #B6G3513  | £41  |
| Dock I IDE install kit #B6G3502   | £45  |
| Dock II #T0020UK  | £300 |
| Dock II display stand #T0020SHEU  | £50  |
| Dock II 555Mb tape backup #T0T020UK   | £473 |

|                          |     |
|--------------------------|-----|
| Microphone kit           | £36 |
| Laptop XL & serial cable | £39 |

### 755CE/CD only options

|                          |      |
|--------------------------|------|
| Headset                  | £95  |
| DAA/telephony kit        | £104 |
| FDD bay PCMCIA cartridge | £41  |

All prices exclude delivery and VAT (17.5%). Delivery:- Systems £19. Lasers and large items £15, software and small items £10. Visa /Access/ American Express /Switch and Government orders welcome. Prices, specifications and offers are subject to change and subject to our conditions of sale copies of which are available on request. Mail order only. No collections please. Goods are normally despatched within 7 days. All orders will be fulfilled within 28 days unless otherwise specified. E&OE.



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TDR9C



# RELEASE

**OPTI Pantera™**



**pentium™**  
PROCESSOR



In this world of ever changing technology, Opti is a constant leading force, with it's award winning portables such as the Platinum & Chameleon.

We are now proud to present the 90/75MHz **OPTI PANTERA**, which is a major leap in 64 bit portable technology. "A P90 Pentium machine that provided the fastest PC bench 95 figures we've ever seen, even beating 90MHz desktop Pentium fliers", according to PC Direct Magazine March 95. With such a machine it's potential uses are endless, from Research to Design, Education and Finance.

The OPTI Pantera series is structured around a 64 bit PCI Local Bus architecture, which compliments its 10.4" STN or TFT screen, both of which offer simultaneous display up to 1024x768 with 256 colours, or 24 bit true colour at lower resolutions. A built in Soundblaster Pro 16 compatible soundcard, giving 16 bit stereo recording & playback. For storage, options to upgrade the new enhanced IDE hard disc from the standard 360MB right up to an amazing 1 Gigabyte. It's 8MB ram is expandable in easy stages up to 40MB, add this to the endless PCMCIA plug & play options, and the PANTERA is a irresistible system for all users.

ENHANCED  
**IDE**



**PCI**  
LOCAL BUS



display, eliminating the need for an external monitor. The Zinc-Air battery technology is also now available, and is compatible with all notebooks and will yield a battery life of up to 3 days. All of OPTI's products are given a Peace of Mind, 3 Year Warranty. So when you're looking for the latest in upgradable technology at an affordable price, look no further than OPTI. You can view the complete range via our countrywide network of dealers.

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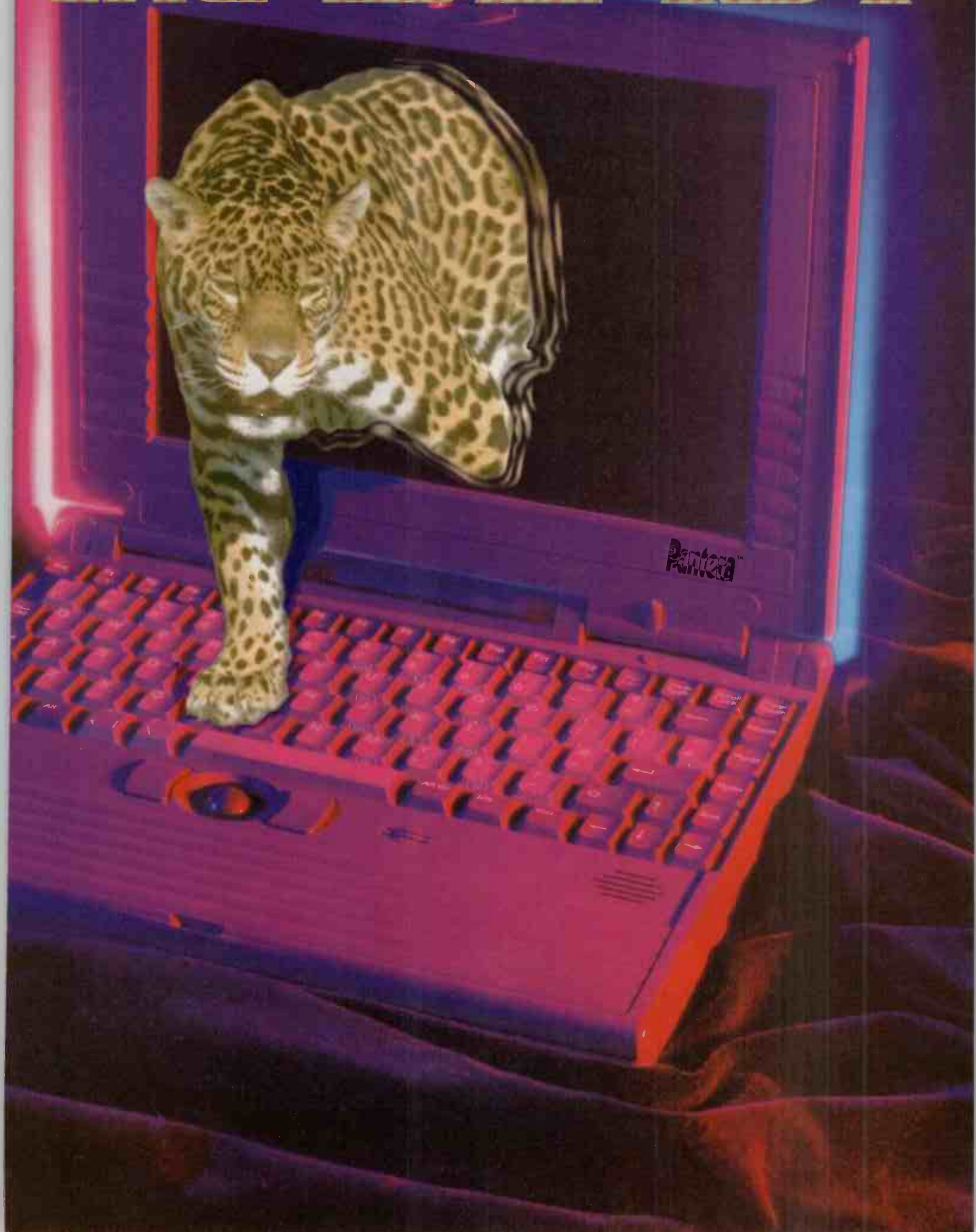
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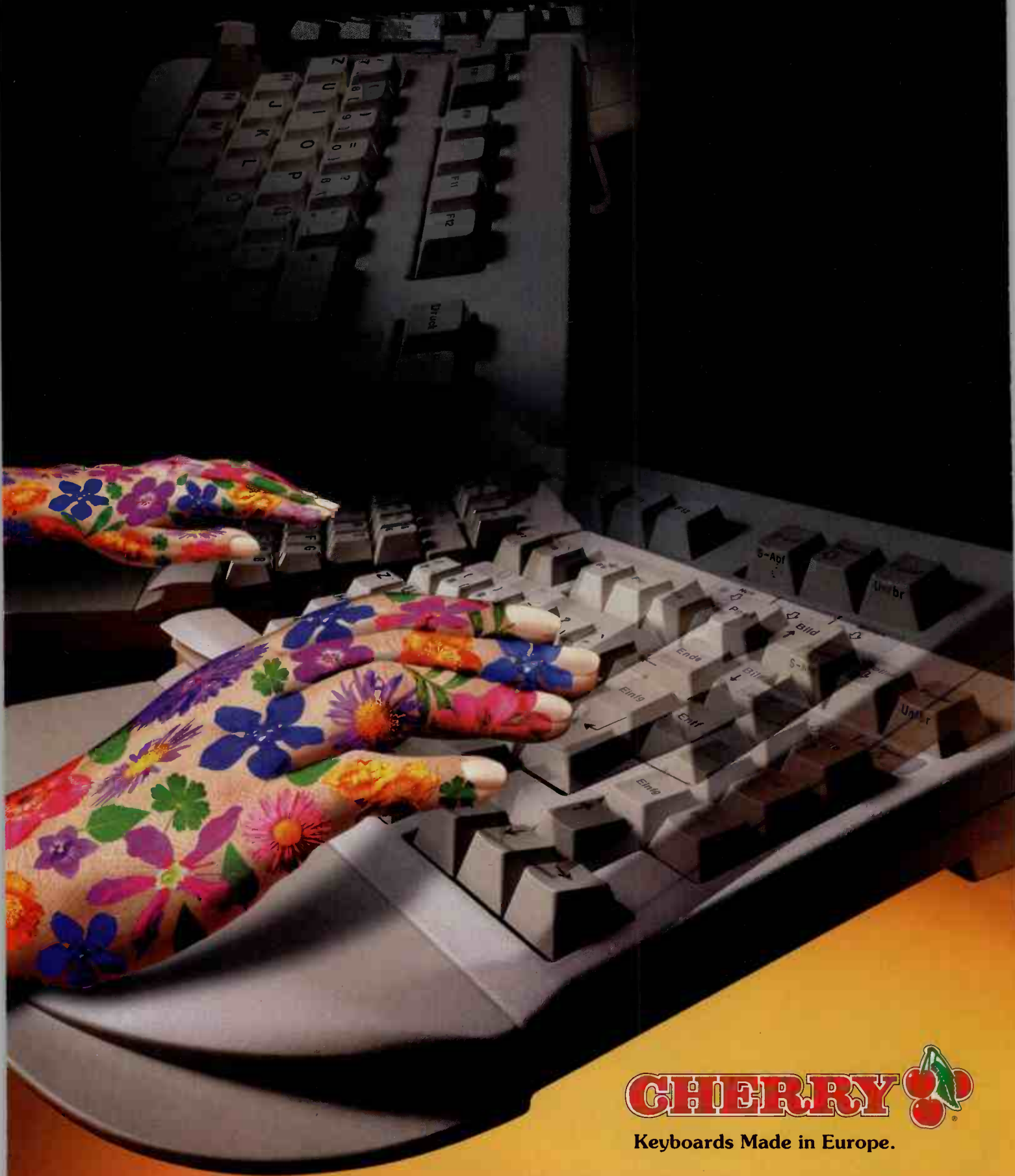


# the BEAST





# The Keyboard designed with Nature in Mind. ErgoPlus.



**CHERRY** 

Keyboards Made in Europe.



IF YOU'RE ABOUT TO CHOOSE A PC (OR PCs), FOUNTAIN  
INTRODUCE A THOROUGHLY NEW CONCEPT, A UNIQUE  
EXTRA DIMENSION, PLUS ADDED VALUE ONE-ON-ONE  
SERVICES & SUPPORT YOU JUST CAN'T IGNORE.

WE CALL IT...

# FOUNTAIN 'ON-LINE'



INTERNET vto.  
PIPEX



Internet Connected • Worldwide Web • E-Mail • On-Line Support • Information SuperHighway  
Delivered, installed and fully configured...  
by one of our engineers at your site and at your convenience



- INTEL BASED FOUNTAIN PC SYSTEMS • NETWORK SYSTEMS AND BUSINESS SOLUTIONS • PROJECT MANAGEMENT AND SOFTWARE
- DATA CAPTURE AND ARCHIVING • VIDEO CONFERENCING • TELEPHONE CALL MANAGEMENT AND AUTO ATTENDANT SYSTEMS
- MULTI-MEDIA AND FULL SCREEN, FULL MOTION VIDEO (MPEG) SYSTEMS

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# MEET FOUNTAIN 'ON-LINE', YOUR LINK TO THE

**ALL FOUNTAIN ON-LINE PC SYSTEMS ARE DELIVERED, INSTALLED AND FULLY CONFIGURED BY ONE OF OUR ENGINEERS, AT YOUR SITE AND AT YOUR CONVENIENCE**

## WE CONNECT YOU TO THE INTERNET

Highmead Technologies are proud to introduce a Unique First Fountain "On-Line". From March 14th we offer our Single and SOHO (Small-Office, Home-Office) users a range of PC systems with Specifications, Support and Services On-Line, in essence, total connectivity packages that were hitherto only available to our larger multi-unit purchasers and major Corporates.

### FOUNTAIN PC 'ON-LINE' SYSTEMS INCLUDE:

High speed, fully configured Fountain Approved Internal Fax Modem, the BABT approved Modem is the key to unlock the phenomenal power of the Information Super Highway. ALL FOUNTAIN 'ON-LINE' PC

### PIPEX 'BACKBONE' TECHNICAL SPECIFICATION

- Full Internet access using Windows based software.
- Optimised TCP/IP stack from FTP Software Inc.
- POP Mailbox within PIPEX.COM domain for sending and receiving mail.
- MIME & MAPI-compliant E-Mail reader.
- Netscape browser for WorldWide Web & USENET access.
- Telnet and Ping utilities for On-Line upgrades.
- Secure communications and back-up resilience.

SYSTEMS ARE DELIVERED TO YOUR DOOR BY ONE OF OUR QUALIFIED ENGINEERS\*, at a mutually convenient time and date, who will install and configure your system, then, log you on to the Internet via your existing telephone line. Our engineer will even set up your own E-Mail address, then launch you on to the "WorldWide Web", and you will have instant access to innumerable services throughout the world.

### PROFESSIONAL COMMUNICATIONS SOFTWARE

- NETSCAPE.... Internet Launcher.
- MAIL-IT.... Comprehensive E-Mail software, editor and address book.
- TELNET and PING.... Utilities and On-Line upgrading features.
- ON-LINE SUPPORT.... Via E-Mail and Hotline.
- GENESIS DISK.... System re-configuration file manager (Unique to Fountain Systems).
- REMOTE DIAGNOSTICS.... We remotely control your system, its like having one of our engineers inside your computer to correct any problems.
- WinFAX.... A Windows based FAX system for sending and receiving FAXES.
- DosFAX.... A Microsoft DOS based FAX system for sending and receiving FAXES.

We have formed a strategic alliance with PIPEX, Europe's premier commercial Internet 'Backbone' provider and together we are pleased to offer, included in the system price, one month's free usage of the Internet (you only pay for local calls).

Quite simply, you just click onto the PIPEX icon which will dial your local number and you are on the Super Highway.

### CALL CHARGES AND SPECIFICATIONS.

You only pay call charges to your local Point of Presence (POP), which allows you to send messages, receive information, and indeed, download software from around the world for the price of a call to your local POP.

Our high quality software included in the price (SRP over £250) has no Shareware or ad-hoc programmes but is a full Professional and Comprehensive Communication Package. Because you are communicating worldwide there is a subscription fee of £4.38 per week, but this covers all International call fees, so please note that you only pay for the cost of the local call. There are no other charges.

### ADVANCED SUPPORT & SERVICE.

All Fountain 'On-Line' PCs come with advanced service

and support. As you are now 'On-Line' with Fountain, if you need technical support (not technical training - see below), we now have the opportunity to solve your problem, down the Modem. Call us or Fax us and in most cases we will now be able to get you up and running quicker than ever before.

### TRAINING.

All Fountain On-Line PCs come with optional training. We are now in a position to offer beginners a One to One 40 minute training session on DOS and Windows at £45 + VAT, via our trained engineers. This service can only be offered at the time of delivery and should be booked when ordering the system.



### FOUNTAIN APPROVED 14,400 MODEM SPECIFICATION

- Full BABT approval - Certificate No. BABT/93/0786.
- 14,400bps Send & Receive FAX Internal Half Card.
- High Speed 16,550 UART.
- MNP class 2-4 Microcom error correction.
- MNP 5 Microcom Data Compression.
- CCITT V.32 bis/V.17 14,400.
- Group 3 FAX.

**BABT Approved**  
APPROVED FOR USE WITH  
TELECOMMUNICATIONS  
SYSTEMS RUN BY BRITISH  
TELECOMMUNICATIONS.

### Fountain DX2 66 EXL 'On-Line'

- Intel® DX2 66 66Mhz Processor
- 8Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 540Mb Enhanced IDE HDD
- FTN X1PCI Bus 1Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty



**£1149<sup>(ex VAT)</sup>**

Or around £11.50  
per week with  
Fast-Track  
Finance



### Fountain DX4 100 EXL 'On-Line'

- Intel® DX4 100 100Mhz Processor
- 8Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X2 PCI Bus 2Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty



**£1349<sup>(ex VAT)</sup>**

Or around £13.50  
per week with  
Fast-Track  
Finance



### Fountain P5-60 EXL 'On-Line'

- Pentium™ 60Mhz Processor
- 8Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X2 PCI Bus 2Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty



**£1399<sup>(ex VAT)</sup>**

Or around £14.00  
per week with  
Fast-Track  
Finance



All the above Fountain 'On-Line' Systems include: Fully Configured Fountain Approved 14,400 Baud Internal Fax / Modem, PIPEX Communication Software, One Months FREE Subscription to the PIPEX Internet Backbone, Genesis System Re-Creation File Manager Disk, 10 Metre Telephone Extension Cable (if required) plus our Fountain Microsoft Executive Collection and Full On-Site Installation and Configuration via our Bull Worldwide Information Systems Engineers.



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**APRIL '95  
SALES LINES  
OPEN TILL 9.00pm**

\* This Service is not available in certain areas.



**For Further Information or to Order Call 01707-27-26-27**

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# SUPERHIGHWAY AND MUCH MORE!

## FOUNTAIN DX2 66 ENL SYSTEM 'ON-LINE'

With information and services on the Internet becoming more numerous, professional and indeed more fascinating by the day, and with Microsoft Windows '95 on the horizon, a new chapter of Plug-and-Play 32-Bit computing is evolving. New interactive software is becoming ultra sophisticated and will demand processor speeds and disk space, hitherto unheard of. For under £950 our ENL (Entry Level On-Line) system (ex VAT) we give you, not only a complete PC system with a full Microsoft Software Suite but also the power and connectivity to literally put the world at your fingertips.

14" Energy Saver, Non-Interlaced  
Super VGA Colour Monitor

(Non-Interlaced, Flicker-Free display, up to  
1024 x 768 resolution, up to 90Hz refresh rate)

Fountain Motherboard with PCI Bus  
32-Bit Expansion Slots

(2 Serial, 1 Parallel & 1 Games Port)

512k Accelerator Graphics Card

425Mb fast access  
Enhanced IDE HDD

UK 102 Key Keyboard

Desktop or Midi Tower  
(Available for the same Price)

Ergonomic Mouse

**FOR POWER USERS WE  
RECOMMEND**

- Minimum of 8Mb RAM
- Minimum 540Mb HDD
- Fountain X1 PCI Bus  
1Mb Graphics Card

(See our Fountain EXL Models  
below and opposite)

Intel DX2™66MHz with 4Mb RAM

(Single chip upgradeable CPU, RAM  
expandable to 128Mb, 8k Internal Cache &  
256k Ext Cache)

Fountain Approved 14,400  
Baud Internal Modem

(Full BABT approval, 14,400bps Send &  
Receive FAX, High Speed 16,550 UART,  
CCITT V.32 bis/V.17 14,400)

Telephone Extension Cable (if Required)

3.5" 1.44Mb Floppy Drive

12 Months On-Site Warranty  
Included in the Price

(See Fountain Aftercare Options  
for additional Service Options)



# £949.95

(ex. VAT)

### HIGHMEAD FAST-TRACK FINANCE

From Around **£9** Per Week Finance available over 12, 24 and 36 months. Call for full details.

### THE FOUNTAIN EXECUTIVE COLLECTION INCLUDED IN THE PRICE



Microsoft  
Works



Microsoft  
Publisher



Microsoft  
Productivity  
Pack



Microsoft  
Entertainment  
Pack



Microsoft  
DOS 6.20



Microsoft  
Windows  
3.11

### Fountain P5-75 EXL 'On-Line'

- Pentium™ 75Mhz Processor
- 8Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X2 PCI Bus 2Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1449.95** (ex VAT) Or around  
£14.50 per week  
with Fast-Track Finance



### Fountain P5-90 EXL 'On-Line'

- Pentium™ 90Mhz Processor
- 16Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 1Gb Enhanced IDE HDD
- FTN X4 PCI Bus 4Mb Video Card
- 15" Super VGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1999.95** (ex VAT) Or around  
£20.00 per week  
with Fast-Track Finance



### Fountain P5-100 EXL 'On-Line'

- Pentium™ 100Mhz Processor
- 16Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 1Gb Enhanced IDE HDD
- FTN X4 PCI Bus 4Mb Video Card
- 17" Super VGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£2299.95** (ex VAT) Or around  
£23.00 per week  
with Fast-Track Finance



All the above Fountain 'On-Line' Systems include: Fully Configured Fountain Approved 14,400 Baud Internal Fax / Modem, PIPEX Communication Software, One Month's FREE Subscription to the PIPEX Internet 'Backbone', Genesis System Re-Creation File Manager Disk, 10 Metre Telephone Extension Cable (if required) plus our Fountain Microsoft Executive Collection and Full On-Site Installation and Configuration via our Bull Worldwide Information Systems Engineers.

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New Scottish Sales Office  
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Fax 01475 743 828



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MEET FOUNTAIN 'ON-LINE', YOUR LINK TO THE SUPERHIGHWAY AND MUCH MORE!



# FOUNTAIN STAND-ALONE

Later this year a whole new chapter of Plug-and-Play 32-Bit computing will emerge. New applications will be ultra sophisticated and demand processor speeds and hard disk space hitherto unheard of. Today, all our PCs include PCI Bus, and as a minimum 425Mb Enhanced IDE Hard Disk Drives and support the new Plug-and-Play standard. Check out our specification and prices listed below, from under £800 excluding VAT. For users looking for intelligent workstations, the specification of our new EN8 model featured below makes it an ideal workstation.

**Intel DX2™66MHz Processor with 8Mb RAM**  
(Single chip upgradeable CPU, RAM expandable to 128Mb, 8k Internal Cache, 256k Ext Cache)

**540Mb Ultra Fast Access Enhanced IDE HDD**

**PCI Bus 32-Bit Expansion Slots**  
(2 Free 32-Bit PCI Bus and 3 Free 16-Bit ISA Slots)

**512k Accelerator Graphics Card**

**Ergonomic Mouse**  
(Two Button, Microsoft Compatible)

**Software Included in the Price**  
(Microsoft DOS 6.20, Windows 3.11 with Windows for Workgroups)



**FOR POWER USERS WE RECOMMEND**  
• Fountain X1 PCI Bus 1Mb Graphics Card  
(See our Fountain EX Models below and opposite)



**SuperScreen 14" Energy Save Non-Interlaced Super VGA Colour Monitor**  
(Non-Interlaced, Flicker-Free display, 1024 x 768 resolution, up to 90Hz refresh rate)

**Desktop or Midi Tower**  
(Available for the same price)

**12 Months On-Site Warranty Included in the Price**  
(See Fountain Aftercare Options for additional Service Options)

**3.5" 1.44Mb Floppy Disk Drive**

**£899.95** (ex. VAT)

**HIGHMEAD FAST-TRACK FINANCE**  
From Around **£9** Per Week  
Finance available over 24 and 36 months at a APR of just 19.5% (1% months available at 24.5% APR) - 10% Deposit

## THE FOUNTAIN EXECUTIVE COLLECTION INCLUDED IN THE PRICE (EX MODELS ONLY)

|  |   |   |  |   |  |
|--|---|---|--|---|--|
| <p><b>Microsoft Works</b><br/>An Integrated Package with Word Processor, Spreadsheet, Database &amp; Graphics.</p> | <p><b>Microsoft Publisher</b><br/>The easiest way to create professional Desktop Publishing Documents</p> | <p><b>Microsoft Productivity Pack</b><br/>An entertaining way to learn how to use your computer</p> | <p><b>Microsoft Entertainment Pack</b><br/>Light Entertainment with something for everyone</p> | <p><b>Microsoft DOS 6.20</b><br/>Latest version of Microsoft's DOS 6.20</p> | <p><b>Microsoft Windows 3.11</b><br/>With Windows for Workgroups</p> |
|--|---|---|--|---|--|

### Fountain DX2 66 EX

- Intel® DX2 66 66MHz Processor
- 8Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 540Mb Enhanced IDE HDD
- FTN X1 PCI Bus 1Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£999.95** (ex. VAT) Or around **£10.00** per week with Fast-Track Finance



### Fountain DX4 100 EX

- Intel® DX4 100 100MHz Processor
- 8Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X2 PCI Bus 2Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1199.95** (ex. VAT) Or around **£12.00** per week with Fast-Track Finance



### Fountain P5-60 EX

- Pentium™ 60MHz Processor
- 8Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X1 PCI Bus 1Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1249.95** (ex. VAT) Or around **£12.50** per week with Fast-Track Finance



#### Fountain DX2 66 / DX4 100 Specification

• Intel 486DX2 / 4 CPU with PCI Local Bus Addressing • Fast Intel Internal 8Kb Cache • Minimum 4Mb RAM (expandable to 128Mb) • Zif Socket • AMI Bios • Transparent 8042 Emulation for Fast CPU reset and Gate A20 Generation • Shadow RAM for Video and Bios ROM • 3 Free 16Bit Expansion Slots and 3 Free PCI Bus Slots • Copy-Back Direct Mapped Cache • 1 x 3.5" and 1 x 5.25" Free Drive Bays (Tower = 4 x 3.5" Free Internal Drive Bays and 3 x 5.25" Free External Drive Bays) • Minimum 425Mb Hard Disk Drive • Average Seek Time = better than 12ms • Cache Buffer = 64Kb with Write Cache • Data Transfer Rate = 6Mb Per Second • 3.5" 1.44Mb High Density Floppy Disk Drive • 5 x ISA 16Bit Slots & 3 x PCI Local Bus Slots • Graphics Accelerator Card • 14" SVGA Non-Interlaced Colour Monitor • Resolution = 1024 x 768, 800 x 600, 640 x 480, 640 x 350 • Scanning Frequency = Vertical = 47-90Hz, Horizontal = 29KHz to 40KHz • Refresh Rate = up to 90Hz • Distortion <=2.5mm Geometric, <=2.0mm Pin Cushion • Tilt and Swivel Base • 102 Key UK Enhanced Keyboard • Microsoft Works for Windows • MS-DOS 6.20 • Windows 3.11 with Windows for Workgroups • Mouse • Enhanced IDE Interface - support for 4 x E-IDE Hard Disk Drives and 2 x Floppy Disk Drives • Landmark test results (V2.0): 222.72 / 360.00MHz • Power Meter (V1.7): 19.5MIPS • Desktop Case Dimensions: 6" high x 16" wide x 17" deep • Tower Case Dimensions: 18.5" high x 8" wide x 16" deep • Total System Weight including monitor: 31Kg.

#### Fountain P5-60 / P5-75 / P5-90 / P5-100 Specification

• Intel Pentium™ 60-100MHz MicroProcessor options • Internal 16Kb Write-Back Cache split into 8K Code and 8K Data Cache, 256K Direct Mapped, Write Through Second Level Cache • 4Mb RAM (expandable to 128Mb) • Overdrive Processor for Pentium MicroProcessor • Flash AMI Bios • 3 Dedicated 16Bit Expansion Slots and 3 Dedicated PCI Slots, 1 Slot for ISA or PCI • 1 x 3.5" Free Drive Bays and 4 x 5.25" Free External Drive Bays (Tower Case) • Minimum Hard Disk Size - 425Mb • Average Seek Time = better than 13ms • Cache Buffer = 64Kb with Write Cache • Data Transfer Rate = 6Mb Per Second • 3.5" 1.44Mb High Density Floppy Disk Drive • 64-Bit Graphics Engine • 14" SVGA Non-Interlaced Colour Monitor • Resolution = 1024 x 768, 800 x 600, 640 x 480, 640 x 350 • Scanning Frequency = Vertical = 47-90Hz, Horizontal = 29KHz to 48KHz • Refresh Rate = up to 90Hz • Distortion <=2.5mm Geometric, <=2.0mm Pin Cushion • Tilt and Swivel Base • 102 Key UK Enhanced Keyboard • MS-DOS 6.20 • Windows 3.11 with Windows for Workgroups • Mouse • Enhanced IDE Interface - support for 4 x E-IDE Hard Disk Drives and 2 x Floppy Disk Drives • Desktop Case Dimensions: 6" high x 16" wide x 17" deep • Tower Case Dimensions: 18.5" high x 8" wide x 16" deep • Total System Weight including monitor: 31Kg.

**APRIL '95**  
**SALES LINES**  
**OPEN TILL 9.00pm**

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# OR NETWORK READY SYSTEMS

Now is the time for Highmead & Fountain to bring you ultimate PC performance and power at prices which will amaze you. Our latest Fountain P5-60, 75, 90 and 100 range feature awesome Pentium™ processors and the latest Plug-and-Play PCI Bus which will enable you to blaze through the most demanding of graphic intensive and computation heavy applications as well as run more conventional applications at speeds hitherto unheard of.

Pentium™ 75MHz Processor  
with 8Mb RAM  
(Expandable to 128Mb)

(Fully upgradeable, 16k Internal  
and 256k Ext. Cache)

850Mb Ultra-Fast Access  
Enhanced IDE HDD

(PCI Bus Controller)

2Mb PCI Bus Graphics Card

PCI I/O Controller

(2 High Speed Serial, 1 Enhanced  
Parallel & 1 Game Port)

Ergonomic Mouse

(Two Button, Microsoft Compatible)

The Fountain Executive Pack

MS-DOS 6.20 and Windows 3.11  
(inc. Windows for Workgroups),  
Microsoft Works, Microsoft Publisher,  
Microsoft Productivity Pack &  
Microsoft Entertainment Pack.

12 Months On-Site Warranty Included in the Price  
(See Fountain AfterCare below for additional options)

**FOR ANY SYSTEM NETWORK  
READY ADD £40 (ex VAT)**

SuperScreen 14" Energy Saver,  
Non-Interlaced, Super VGA Colour Monitor

(Non-Interlaced, Flicker-Free Display,  
up to 1024x768 max. resolution,  
up to 90Hz refresh rate)



PCI Bus 32-Bit Expansion Slots  
(2 Free 32-Bit PCI Bus and 3 Free 16-Bit  
ISA Expansion Slots)

**£1299.95** (ex. VAT)

**FASTTRACK FINANCE**  
From Around **£12** Per Week  
Finance available over  
24 and 36 months at an  
APR of just 13.5% (12  
months available at  
24.5% APR) 10% Deposit

## Fountain P5-75 EX

- Pentium™ 75MHz Processor
- 8Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X2 PCI Bus 2Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1299.95** (ex VAT)  
Or around **£13.00**  
per week  
with Fast-Track Finance



## Fountain P5-90 EX

- Pentium™ 90MHz Processor
- 16Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 1Gb Enhanced IDE HDD
- FTN X4 PCI Bus 4Mb Video Card
- 15" Super VGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1849.95** (ex VAT)  
Or around **£18.50**  
per week  
with Fast-Track Finance



## Fountain P5-100 EX

- Pentium™ 100MHz Processor
- 16Mb RAM, 256Kb Cache
- 3.5" Floppy Disk Drive
- 1Gb Enhanced IDE HDD
- FTN X4 PCI Bus 4Mb Video Card
- 17" Super VGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£2149.95** (ex VAT)  
Or around **£21.50**  
per week  
with Fast-Track Finance



## HIGHMEAD ON-SITE 'AFTERCARE' WARRANTY OPTIONS

Prices applicable from 14th March 1995.

| PERIOD             | CHARGE                    | MINIMUM CHARGE             |
|--------------------|---------------------------|----------------------------|
| Year One           | £ Zero                    | (Included in System Price) |
| Year Two           | 5% of Total System Cost   | £50.00                     |
| Year Two and Three | 8.5% of Total System Cost | £85.00                     |

\* A 10% DISCOUNT IS AVAILABLE FOR 'ON-LINE' SYSTEMS.

eg 1. Fountain DX2 66 EX Years 2 & 3 - System cost £999.95 x 8.5% = £85.00 + VAT

eg 2. Fountain P5-90 EXLM On-Line Year 2 only - System cost £2149.95 x 5% = £107.49 less 10% = £96.74 + VAT

eg 3. Fountain P5-100 EXL On-Line Years 2 & 3 - System cost £2299.95 x 8.5% = £195.50 less 10% = £175.95 + VAT

\* All AfterCare Warranties  
include Technical Support

**NETWORK SYSTEMS  
ON-SITE MAINTENANCE**  
24 Hour / 4 Hour / 2 Hour  
Call out, Exchange  
Service £POA.

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New Scottish Sales Office  
Call 01475 744 488  
Fax 01475 743 828

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**LINES OPEN: Monday to Friday 8.30am to 9.00pm. Saturdays and Bank Holidays 9.30am to 2.30pm. Closed Sundays.**

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FOUNTAIN STAND-ALONE OR NETWORK READY SYSTEMS



# FOUNTAIN MULTI-MEDIA & MPEG SYSTEMS.

## FOUNTAIN DX2 66 ENM SYSTEM

Our latest range of ENM and EXM Multi-Media systems include DX2 66, DX4 100 and our full range of systems featuring Pentium™ processors, PCI Plug-and Play technology and the latest Quad Speed Toshiba fast IDE CD-ROM Drive which features sub 150ms access time and conforms to "White Book" standards. Our ENMs come with a minimum of 425Mb (540Mb with EXMs) Hard Disk Drive, plus, the Fountain Executive suite of Microsoft software (SRP circa £300) included in the price.

Intel DX2™66MHz Processor with 4Mb RAM

(Single chip upgradeable CPU, RAM expandable to 128Mb, 8k Internal Cache, 256k Ext Cache)

425Mb Fast Access Enhanced IDE HDD

PCI Bus 32-Bit Expansion Slots

(2 Free 32-Bit PCI Bus and 3 Free 16-Bit ISA Slots)

512k Accelerator Graphics Card

**£949** (ex. VAT) .95

### HIGHMEAD FAST-TRACK FINANCE

From Around **£9.50** Per Week  
Finance available over 24 and 36 months at an APR of just 19.5% (12 months available at 24.5% APR) 10% Deposit

### FOR POWER USERS WE RECOMMEND

- Minimum of 8Mb RAM
- Minimum 540Mb HDD
- Fountain X1 PCI Bus 1Mb Graphics Card (See our Fountain EXM Models below and opposite)

THE FOUNTAIN EXECUTIVE COLLECTION INCLUDED IN THE PRICE



SuperScreen 14" Energy Saver, Non-Interlaced Super VGA Colour Monitor

(Non-Interlaced, Flicker-Free display, up to 1024x768 maximum resolution, up to 90Hz refresh rate)

Fountain F16 16-Bit Stereo Sound Card

(Features include Messaging System)

12 Months On-Site Warranty Included in the Price

(See Fountain Aftercare Options for additional Service Options)

Toshiba Quad Speed Multi-Session Fast Enhanced IDE CD-ROM Drive

(MPCII standard, Sub 150ms Access Time, 684Kb per sec data transfer rate, 8.33Mb per sec Burst rate)

Desktop or Midi-Tower

(Available for the same price)



### ENCARTA '95 CD-ROM BUNDLE

TO INCLUDE THESE 5 CD-ROM TITLES\* WITH THE ABOVE SYSTEM JUST ADD £69 (ex. VAT)



Encarta '95 Latest Version of Microsoft's Interactive Multi-Media Encyclopedia.



Dinosaurs Discover amazing facts and long buried secrets at every mouse click.



Mayo Clinic Family Health Book The ultimate interactive guide to your family's health



Mega Race Put yourself in the drivers seat in this fast 3-D futuristic racing game.



Compton's '95 Interactive Encyclopedia Articles, Pictures, Videos, Animations plus much more.

### Fountain DX2 66 EXM

- Intel® DX2 66 66MHz Processor
- 8Mb RAM, 256Kb Cache
- Toshiba Quad Speed CD-ROM Drive
- Fountain 16-Bit Stereo Sound Card
- Amplified Stereo Speakers
- 3.5" Floppy Disk Drive
- 540Mb Enhanced IDE HDD
- FTN X1 PCI Bus 1Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1149** (ex. VAT) .95 Or around £11.50 per week with Fast-Track Finance



### Fountain DX4 100 EXM

- Intel® DX4 100 100MHz Processor
- 8Mb RAM, 256Kb Cache
- Toshiba Quad Speed CD-ROM Drive
- Fountain 16-Bit Stereo Sound Card
- Amplified Stereo Speakers
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X2 PCI Bus 2Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1349** (ex. VAT) .95 Or around £13.50 per week with Fast-Track Finance



### Fountain P5-60 EXM

- Pentium™ 60MHz Processor
- 8Mb RAM, 256Kb Cache
- Toshiba Quad Speed CD-ROM Drive
- Fountain 16-Bit Stereo Sound Card
- Amplified Stereo Speakers
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X2 PCI Bus 2Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1399** (ex. VAT) .95 Or around £14.00 per week with Fast-Track Finance



For 'On-Line' Multi-Media Models please add £150.00 + VAT to the above prices.

### Multi-Media Specification - For EXM and EXLM Multi-Media Models

MPC Level II Fast IDE CD-ROM Drive: Toshiba XM-5302B - Quad Speed Series, White Book Standard, Acceptable Discs: Red Book, Yellow Book, CD-ROM XA, Photo-CD Multi-Session, CD-Bridge CD-I and CD-I Ready. Data Transfer Rate: 684Kbytes per second (sustained), Burst Rate: 8.33Mbytes per second, Access Time: Better than 150ms, Full stroke = 340ms (typical). Audio: Line Output: 0.9v at 47KOhm, Fountain F16 16-Bit Stereo Audio Card, SoundBlaster 16-Bit and Roland MPU401 MPCII compatible, Microsoft Windows compatible, Audio Features: 16Bit and 8bit stereo digital sound, Interrupt driven 8-bit DMA or programmed I/O transfer mode, Select sampling rate up to 44.1KHz, Dynamic range exceeds 80dB with digital interpolation filter, 80Bit hardware ADPCM decompression (2:1, 2.6:1 and 4:1), Recording Source: Selectable recording source (Microphone input, Stereo line-in, Stereo CD-Audio), Input, Stereo digital recording level control, Stereo Analogue / Digital Mixer: Mixing of ALL audio sources with individual volume control, Mixer Volume

Control is Adjustable by Software, Stereo FM Music Synthesiser producing 20 independent stereo voices of FM synthesised sounds with 4 FM operators (YAMAHA OPL3) Midi Port: Soundblaster compatible MIDI Port, Full Duplex interface for connecting MIDI instruments (requires option MIDI Kit), MIDI time stamp for SoundBlaster compatible MIDI, 64Kbyte MIDI input FIFO, Wave Audio compatible with Wave Table Synthesiser, Fountain F16 Audio Card Software: Media Rack: An integrated set of audio players arranged with the familiar look of a home stereo. Comprising: Talking Clock, Midi Player, CD Player and system mixer. Wave Editor: A digital audio recording and editing tool that lets you create and edit your own audio messages. Presto Arranger: A midi sequencer that lets you edit and arrange MIDI files. Voice Sentry: Uses your own voice for password protection together with a message facility. WINChime: Plays MIDI files gently in the background when you work on applications. Karaoke: Karaoke volume control by TSR.

APRIL '95  
SALES LINES  
OPEN TILL 9.00pm

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\* Available at time of system purchase.  
CD-ROM titles may be subject to change.



For Further Information or to Order Call 01707-27-26-27

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Callers by appointment only. Multiple demonstrations only on Saturdays. Highmead Technologies Limited, Jupiter House, Travellers Lane, Welham Green, Herts. AL9 7DA. Fax: 01707-26-74-00.

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# ON-LINE, STAND-ALONE OR NETWORK READY

**FOUNTAIN DX2 66 FM1 MOVIE MASTER® FULL SCREEN, FULL MOTION VIDEO SYSTEM**  
Now Highmead Technologies take Multi-Media to the next dimension and bring you Full Screen / Full Motion Video at 24-Bit Resolution plus High Quality Digitised Stereo Sound. Now, as well as standard Multi-Media CD-ROMs you can learn from and enjoy the latest Interactive Video CDs. You will be able to freeze frame, draw down and print any frame and can even advance the CD frame-by-frame.

Intel DX2™ 66MHz Processor with 8Mb RAM  
(Single chip upgradeable CPU, RAM expandable to 128Mb, 8k Internal Cache, 256k Ext Cache)

32-Bit Expansion Slots

(2 Free 32-Bit & 3 Free 16-Bit ISA Expansion Slots)

**540Mb Ultra Fast Access**  
Enhanced IDE HDD

1Mb Accelerator Graphics Card

Ace Coin MPEG Card

(ISO 11172 Standard MPEG I, Playback of Video-CD (White Book) and the latest Philips Video-CD)

**£1449.95** (ex. VAT)

**PRICE INCLUDES**  
**3 FREE FULL**  
**MOTION CDs**

SuperScreen 14" Energy Saver,  
Non-Interlaced Super VGA Colour Monitor  
(Non-Interlaced, Flicker-Free display, up to 1024 x 768 maximum resolution, up to 90Hz refresh rate)

Fountain F16 16-Bit Stereo Sound Card  
(Features include Messaging System)

Latest Toshiba Quad Speed Multi-Session  
Fast IDE CD-ROM Drive

(MPCII standard, Sub 150ms Access Time, 684Kb per sec data transfer rate, 8.33Mb per sec Burst rate)

12 Months On-Site Warranty  
Included in the Price

(See Fountain Aftercare Options for additional Service Options)

Desktop or Midi-Tower  
(Available for the same price)

Now  
with  
**QUAD SPEED  
TOSHIBA  
CD-ROM  
DRIVE**

Speakers  
may vary  
from items  
shown.



## THE FOUNTAIN EXECUTIVE COLLECTION INCLUDED IN THE PRICE

|  |  |  |   |  |   |
|--|--|--|---|--|---|
| <b>Microsoft Works</b><br>An integrated Package with Word Processor, Spreadsheet, Database & Graphics. | <b>Microsoft Publisher</b><br>The easiest way to create professional Desktop Publishing Documents. | <b>Microsoft Productivity Pack</b><br>An entertaining way to learn how to use your computer. | <b>Microsoft Entertainment Pack</b><br>Light Entertainment with something for everyone. | <b>Microsoft DOS 6.20</b><br>Latest version of Microsoft's DOS 6.20. | <b>Microsoft Windows 3.11</b><br>With Windows for Workgroups. |
|--|--|--|---|--|---|

### Fountain P5-75 EXM

- Pentium™ 75Mhz Processor
- 8Mb RAM, 256Kb Cache
- Toshiba Quad Speed CD-ROM Drive
- Fountain 16-Bit Stereo Sound Card
- Amplified Stereo Speakers
- 3.5" Floppy Disk Drive
- 850Mb Enhanced IDE HDD
- FTN X2 PCI Bus 2Mb Video Card
- 0.28 14" SVGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1449.95** (ex VAT) Or around £15.00 per week with Fast-Track Finance



### Fountain P5-90 EXM

- Pentium™ 90Mhz Processor
- 16Mb RAM, 256Kb Cache
- Toshiba Quad Speed CD-ROM Drive
- Fountain 16-Bit Stereo Sound Card
- Amplified Stereo Speakers
- 3.5" Floppy Disk Drive
- 1Gb Enhanced IDE HDD
- FTN X4 PCI Bus 4Mb Video Card
- 15" Super VGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£1999.95** (ex VAT) Or around £20.00 per week with Fast-Track Finance



### Fountain P5-100 EXM

- Pentium™ 100Mhz Processor
- 16Mb RAM, 256Kb Cache
- Toshiba Quad Speed CD-ROM Drive
- Fountain 16-Bit Stereo Sound Card
- Amplified Stereo Speakers
- 3.5" Floppy Disk Drive
- 1Gb Enhanced IDE HDD
- FTN X4 PCI Bus 4Mb Video Card
- 17" Super VGA Colour Monitor
- 2 PCI and 3 ISA Expansion Slots
- Desktop or Midi-Tower Case
- 12 Months On-Site Warranty

**£2299.95** (ex VAT) Or around £23.00 per week with Fast-Track Finance



For 'On-Line' Multi-Media Models please add £150.00 + VAT to the above prices.

## CD-ROM DRIVES.. WHY QUAD SPEED, WHY TOSHIBA?

The advent of the CD-ROM drive has enabled the PC Industry to use a low cost storage media, the Compact Disk, that can store up to 680Mb of data (equivalent to 250,000 A4 pages of text). However, slow transfer rates have been a considerable problem and early Single Speed CD-ROM drives that have a data transfer rate of around 150Kb per second have now all but vanished. Double Speed drives, in theory, can transfer data at 300Kb per second, but this is still slow when compared to the transfer speeds of hard disk drives. We are therefore pleased to announce that as of March 14th (or before),

every Fountain Multi-Media PC will be fitted with the very latest Toshiba XM-5302B Quad Speed CD-ROM drive. A drive that boasts a sustained data transfer rate of 684Kb per second. We have tested numerous Quad Speed drives and consider the Toshiba as the best specification and value available. Also, please note that we now connect the drive to an Enhanced IDE (E-IDE) controller, utilising PCI Bus technology. You have our unequivocal guarantee that your Fountain Multi-Media PC will have a specification that is, as we write, at the very leading edge of technology.

H7



New Scottish Sales Office  
Call 01475 744 488  
Fax 01475 743 828



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All prices exclude VAT and delivery @ £15 + VAT, E&OE. Intel, Intel Inside, Intel 486, Pentium®, Overdrive, ProShare and Indeo are trademarks or registered trademarks of Intel Corporation. All other trademarks are acknowledged. All Hard Disk sizes stated are unformatted. E-Mail: sales@fountain.co.uk

FOUNTAIN MULTI-MEDIA & MPEG SYSTEMS. ON-LINE, STAND-ALONE OR NETWORK READY



# HIGHMEAD TECHNOLOGIES FULLY SUPPORTED NETWORK SOLUTIONS

## FOUNTAIN 3 STATION PENTIUM® PROCESSOR NETWORK SYSTEM



(ex VAT)  
**£3999**

### Fountain Non-Dedicated SuperServer

Fountain P5-75 PCI Non-Dedicated Fileserver with Pentium® CPU, Pentium® Overdrive Socket, 8Mb RAM (exp. to 128Mb), CD-ROM Drive, 850Mb HDD with 256k Cache, Internal Tape Streamer, 16-Bit Ethernet Card, Multi I/O Card, Paradise PCI Bus Mastering 1Mb Graphics Card.

### 2 x Fountain DX2 66 Power Stations

Intel 486DX2 66MHz Processor, 4Mb RAM (Expandable to 96Mb), 425Mb Fast Access Hard Disk, 16-Bit Ethernet Card, 512k Graphics Adapter. HP DeskJet 520 Ink Jet Printer.

(All systems have 14" Non-Interlaced Super VGA Colour Monitors, are pre loaded with Windows for Workgroups and include Microsoft Works).

**Full Installation & Configuration by Bull Worldwide Information Systems**  
Subject to site-survey, price includes Installation, Cabling and Configuration.

## FOUNTAIN 5 STATION PENTIUM® PROCESSOR NETWORK SYSTEM



(ex VAT)  
**£6999**

### Fountain SuperServer

Fountain P5-75 PCI Non-Dedicated Fileserver with Pentium® CPU, Pentium® Overdrive Socket, 8Mb RAM (exp. to 128Mb), SCSI CD-ROM Drive, 1Gb SCSI HDD with 256k Cache, Internal Tape Streamer, 16-Bit Ethernet Card, Multi I/O Card, Paradise PCI Bus Mastering 1Mb Graphics Card.

### 4 x Fountain DX2 66 Power Stations

Intel 486DX2 66MHz Processor, 4Mb RAM (Expandable to 96Mb), 425Mb Fast Access Hard Disk, 16-Bit Ethernet Card, 512k Graphics Adapter.

**Full Installation & Configuration by Bull Worldwide Information Systems**  
Subject to site-survey, price includes Installation, Cabling, Configuration and familiarisation.

## FOUNTAIN FAULT TOLERANT 5 STATION NOVELL NETWORK SYSTEM

Our Fault Tolerant Super Server systems include an uninterruptible power supply (UPS) system and a dual 1.0Gbyte fast SCSI Hard Disk Drive RAID Sub Systems so that the potential failure points can be covered at every network level with full expandability possible up to RAID LEVEL 5 and beyond.

(ex VAT)  
**£8999**

### Fountain SuperServer

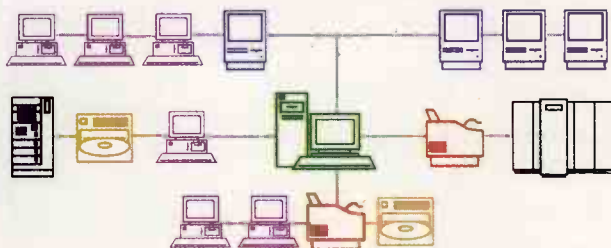
Pentium® P5-90 90MHz Processor, 16Mb RAM (exp. to 128Mb), 16Kb Internal & 256Kb Second Level External Cache, Pentium® level-5 Overdrive Socket, SCSI CD-ROM Drive, 512k Graphics, Dual 1Gb Fast-Access SCSI Hard Disk Drives, 16-Bit Ethernet Card, Uninterruptible Power Supply, Internal Tape Streamer & Novell 5 User Licence.

### 4 x Fountain DX2 66 Power Stations

Intel 486DX2 66MHz Processor, 4Mb RAM (Expandable to 96Mb), 425Mb Fast Access Hard Disk, 16-Bit Ethernet Card, 512k Graphics Adapter.

**Full Installation & Configuration by Bull Worldwide Information Systems**  
Subject to site-survey, price includes Installation, Cabling and Configuration.

## BUSINESS-WIDE NETWORK SOLUTIONS



From large organisations to the small office user our Novell Authorised personnel will provide sound advice (based on practical experience), reliable systems and a comprehensive installation, implementation and support service.

**Circa £40,000**

## A TYPICAL NOVELL BASED HIGHMEAD SUPERSERVER SYSTEM

With it's 100MHz Pentium® Processor our typical Fault Tolerant RAID level 5 SuperServer system includes 96 Mbyte main memory, uninterruptible power supply (UPS) and 21 GigaBytes (21,000 MegaBytes) of Fast SCSI Hard

Disk Drives set in a 7 drive array, or put another way it can store over 20 million pages of text. Potential failure points can be covered at every network level with full expandability. The Core of our SuperServer is based on

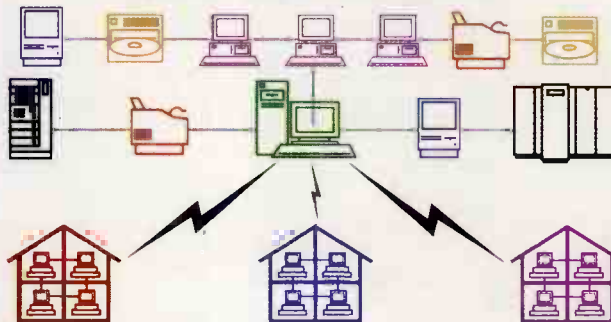
**intel inside**

**pentium**  
PROCESSOR

Intel's 90MHz Pentium® Processor, the first commercially available Complex Instruction Set (CISC) computer.

**Circa £17,000**

## CORPORATE-WIDE NETWORK SOLUTIONS



In large companies where mission critical functions are being performed, we can provide a fault tolerant solution based on our advanced RAID level 5 disk sub-system providing high speed data transmission rates, allowing connectivity to the SuperHighway.

**Circa £400,000**

## BUSINESS FINANCE AVAILABLE

**ASK CORPORATE SALES ON  
01707-27-26-27 FOR DETAILS**

H8



New Scottish Sales Office  
Call 01475 744 488  
Fax 01475 743 828



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# PERSONAL VIDEO CONFERENCING

## MEET THE NEW FOUNTAIN P5-75 EX VCS SYSTEM 'ON-LINE'

**SuperScreen 15" Energy Saver, SVGA Colour Monitor**  
(0.28 Dot Pitch, Non-Interlaced, Flicker-Free display, up to 1280 x 1024 maximum resolution, up to 90Hz refresh rate)

**Multi I/O VESA Card.**  
(2 High Speed Serial, 1 Enhanced Parallel & 1 Games Port)

**Fountain X2 PCI Bus 64-Bit Accelerator Graphics Engine**

**850Mb Fast Access Enhanced IDE HDD**  
(PCI Bus Fast IDE Controller)

**UK 102 Key Keyboard.**

**Ergonomic Mouse.**



**High Resolution Intel™ Camera**  
(Sleek, miniature PAL compatible)

**Intel Pentium® 75MHz Processor with 16Mb RAM**  
(Single chip upgradeable CPU, RAM expandable to 128Mb, 8k Internal Cache & 256k Ext Cache)

**ISDN Communications Card**  
(Approved for connection to basic rate ISDN services in the UK eg. BT & ISDN2)

**Video Compression / Decompression Card**  
(Indeo Video compatible, accepts PAL, NTSC or S/Video input)

**Earpiece and Microphone**  
(Comfortable earpiece with built-in microphone for hands-free operation)

### Software Included In The Price

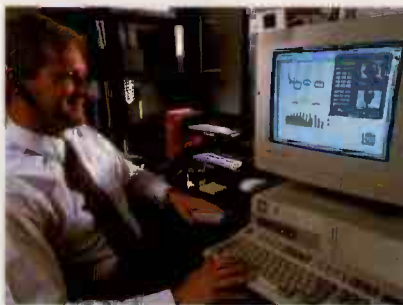
Intel ProShare Personal Conferencing Software, Microsoft Works for Windows, Microsoft Publisher, Microsoft Productivity Pack, Microsoft Entertainment Pack, and the latest MS-DOS 6.20 and Windows 3.11 (inc. Windows for Workgroups).

**Desktop or Midi Tower**  
(Available for the same Price)

**£3299.00** (ex. VAT)

**SECOND AND ADDITIONAL SYSTEMS**  
**£3099.00** (ex. VAT)

## PERSONAL VIDEO CONFERENCING PC TO PC



Highmead Technologies Communication and Personal Video Conferencing Division are proud to bring you Intel's ProShare™ Personal Video Conferencing (PPVC) as a complete system / solution. Whether your colleague is in another part of the building or the other side of the world you can now use not only your voice but every aspect of "your presence" to get your message across. Now, providing, your colleague also has "PPVC" you simply dial his or her number using the graphical on-screen keypad, and it's as easy as operating as the telephone on your desk. You can share a document while you see and hear each other and this will enable you to communicate more clearly and make decisions faster. Think about it.



You can now establish a PPVC connection to your most important customers, manage product development, project times, reviews, schedules, budgets, data etc, or even just say hello. But now you do it face to face. Personal Video Conferencing can speed up your time to market, avoid costly mis-communications, as well as save hours, days even weeks of travel. Intel's ProShare™ software features on screen notebook, mark-up tools and pointer, snapshot and document import, plus shaped O.L.E. (Object Linking and Embedding) enabling you to launch the source application, make changes, then instantly update the documents in the "on screen" notebook. Intel's ProShare™ software also gives you application sharing so you can work together interactively editing the same files within the original

application, plus an address book to store, group, and dial frequently called numbers. We've combined Intel's PPVC with our new Fountain P5-75 EX VCS Computer System (specification as above) so now you have a powerful and complete Personal Video Conferencing System at an unbelievable price. For further information call us on 01707-27-26-27 and ask for the V.C. Division. 21st Century Technology now from Highmead Technology.....Who else!



**APRIL '95**  
**SALES LINES**  
**OPEN TILL 9.00pm**

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### ISDN TELEPHONE LINES

To use ProShare Personal Video Conferencing you need an ISDN2 telephone line, now freely available in most all areas of the UK, Europe and the USA. We can probably arrange the installation of an ISDN2 line for you within days. Once ISDN is installed, a Video Conference call within the UK costs the same as an ordinary call, International Video Conference calls cost up to 18% less than normal International calls.



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# HIGHMEAD TECHNOLOGIES BUSINESS SOFTWARE DIVISION

Highmead's Business Software Solutions Division is probably one of the fastest growing full 'Turnkey' solutions houses in the UK. Today at Highmead we boast a multiplicity of professionals who specialise in Tailored Business Software, NetWare Networking, Raid 5 level (and beyond) Client Servers and a whole host of other business integration products and Hardware Platforms. Perhaps the reason for our growth, apart from the fact we care, is that we cover the whole spectrum of your solution, from networked hardware to applications software customisation, right through to ongoing support. With Highmead you won't get 'oh that's a hardware problem, try the hardware vendor' or 'that's a software problem, try the software people'. We support the complete solution. At Highmead, we utilise 4th generation development technology in our software solutions which allows greater flexibility in tailoring and adaptability. Our key software product is Concorde XAL, by far the best selling integrated business management package in Scandinavia (with over 80% market share there) and we know it inside out, module to module. If you are considering upgrading your business system, call David Rickards or Russell Lawrence on 01707 27-26-27, you'll be pleased with what we have to offer - We promise.

## FOUNTAIN TELEPHONE SYSTEMS DIVISION FOUNTAIN 486DX2 66 EX CMS CALL MANAGEMENT SYSTEM

The Fountain CMS is a complete Telecommunications Management System. It helps you develop and maintain an efficient telecommunications environment which can grow without you losing control. The CMS has two main components, a data collection function that is permanently active and Report Production function that is used when required. The CMS collects the call data records outputted by your phone system, after a call is completed. Each record is then checked, costed and stored. For many organisations the CMS will pay for itself in under six months, but as well as saving money the CMS can also be used by businesses who recharge their phone costs to customers or clients. Key features include: comprehensive and precise reporting, costing of alternative network carriers, analysis of operator response, evaluation of line usage to determine optimum number of incoming / outgoing lines, call billing and accurate departmental budgeting.

**Fountain DX2 66 EX CMS including Call Management Software, Installation and 12 Months Maintenance prices from**

**£1995** (ex VAT)



## FOUNTAIN 486DX2 66 EX VMS VOICE MESSAGING SYSTEM

Our VMS1 is an interactive user-friendly call handling system offering the very latest in telecommunications technology to enable you to handle many thousands of telephone calls per day using Auto Attendant and Voice Mail. This alleviates routine switchboard traffic and assists or even eliminates operators and certainly is very cost effective. Auto Attendant greets callers with the company's message, transfers calls to the appropriate extensions, queues callers onto busy extensions, gives names and extension numbers of staff in any department and much much more. For further information call Gerry O'Neill on 01707 27-26-27.

**Fountain DX2 66 EX VMS prices from**

**£5000** (ex VAT)



## ABOUT FOUNTAIN AND HIGHMEAD



Highmead Technologies, Hatfield, England.

Whether your annual IT budget is £4,000, £4m, more, or somewhere in between, Highmead Technologies would welcome the opportunity to talk to you face to face about your individual requirements.



Fountain Technologies Inc., New Jersey.

Thanks to strategic and unique relationships with Fountain in the USA, Bull Worldwide Information Systems and key UK software developers and publishers, Highmead Technologies is in an ideal position to come up with the right solution to meet your needs, first time around.

Highmead Technologies specialise in PC systems, On-Line or Off-Line, Network Solutions, Data Capture and Archiving, Business Software, Project Management and Video Conferencing and we are one of the fastest growing PC companies in the UK. One reason for this could be that our goal is, once and for all, to eliminate the mystique and, indeed, the price sting from networking and integrated software solutions.



Real-time Order Fulfilment.

Whether you require a simple three station, Intel based, peer-to-peer Fountain business system or a large multi-gateway wide area network, or a complete software and hardware solution, we will ensure that you don't "pay through the nose" for



Highmead Service and Support Team.

hardware, software and for the multiplicity of consultancy costs and on going support costs that some of our competitors tend to charge.

Just now, we are installing Network systems from as little

as £4,000

through £40,000 to more than £1million (for H.M. Government and others), and we have any number of varied reference sites available for you to visit. Call our Corporate Division now or complete and return the coupon below.



Forming Business Partnerships.



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**We would like to add Highmead Fountain to our IT vendor shortlist.**

Please ask a Highmead Fountain Corporate Manager specialising in our field to call us.

Company Name: \_\_\_\_\_ Contact Name: \_\_\_\_\_ Job Title: \_\_\_\_\_

Address: H10 \_\_\_\_\_ Post Code: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_ Business Activity: \_\_\_\_\_ Size of Installation: \_\_\_\_\_

Please complete and return to: Highmead Technologies Ltd, Jupiter House, Travellers Lane, Welham Green, Hatfield, Herts, AL9 7DA.



For years avid computer users have been searching for a keyboard that will adjust to their individual postures, thus helping to prevent cramp and tension in their wrists, arms and shoulders. Cherry's new ErgoPlus is the answer to these pleas. It is highly ergonomic and adapts to the needs of every user as it can be set to any of a total of 24 different positions on 3 axes. At last a keyboard that Mother Nature can really enjoy. Free of CFCs. 90% recyclable. 100% tested. Because Cherry keyboards are quality products manufactured in our ISO 9001 certified company. Test our competence. Send today for further technical details!

3 of 24 different positions:



Keyboard in basic position with optional numeric pad on the right.



Keyboard split at an angle of 30°.



Keyboard split at an angle of 30° with steep roof inclination and optional numeric pad on the left.



### PC INDUSTRIAL CHASSIS

|  |     |
|--|-----|
| 19" Industrial Chassis (Passive Backplane)   | 499 |
| 19" Industrial Chassis (PC Motherboard ver.) | 449 |
| 19" Rackmount Kit for 14" Monitor            | 245 |
| 19" Rackmount Keyboard and drawer            | 285 |

### PASSIVE BACKPLANE

|   |    |
|---|----|
| PC-Bus Passive Backplane Board (8 Slots)* | 45 |
| PC Slot Extension Kit(XT/AT)              | 55 |
| PC-Bus Switch/Extension Card              | 95 |

### PLUG-IN CPU CARDS

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|---|-----|
| 80286 16MHz Plug-in CPU + Multi I/O     | 129 |
| 80286 16MHz + ROM Disk & Watchdog       | 189 |
| 80386SX-25 Multi I/O with Watchdog      | 225 |
| 80386SX-33+ Multi I/O+Flash ROM Disk    | 285 |
| 80486SX 33 MHz+(256K Cache)+Multi I/O   | 365 |
| 80486DX-33 MHz (256 K Cache)+Multi I/O  | 515 |
| 80486DX2-50 MHz (256 K Cache)+Multi I/O | 535 |
| 80486DX2-66 MHz (256 K Cache)+Multi I/O | 565 |

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| 16 Ch Data Acq. & control Card (14 bit)* | 489 |
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| 6 Ch D/A Output + 16 I/O (12 bit)*       | 279 |

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| 8 Ch Relay Output & Isolated D/I  | 120 |
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| Stepping Motor Controller Card    | 229 |

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| Dual RS232 (Com 1,2,3,4 Selectable)   | 15  |
| 4 Port RS232                          | 45  |
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| 8 Port Intelligent RS232 Card         | 295 |
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| Isolated RS422/485 Interface Card     | 99  |
| Multi Function IEEE-488 Card          | 160 |
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| RS 232/485 Convertor                  | 75  |
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### DEVICE PROGRAMMER

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| 4 Gang Eprom Programmer (16K-1024K)    | 199 |
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| T1910 8MB        | PA2013U          | 71812-Q  | £345  |
| T2400 8MB        | PA2020U          | 74779-Q  | £427  |
| T1910 16MB       | PA2014U          | 72949-Q  | £1489 |
| T2400 16MB       | PA2023U          | 75605-Q  | £1275 |

| BATTERIES                                    | TOSHIBA PART NO. | ITEM NO. | PRICE |
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| T1910/T2400 Battery pack (NiH <sub>2</sub> ) | PA2429U-R        | 75607-Q  | £102  |
| Battery charger                              | PA2422U-E        | 73444-Q  | £125  |

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| 2.0 + Fax                 | PA2704U          | 75609-Q  | £139  |
| T2400 Port Replicator     | PCE-10BC         | 75611-Q  | £267  |
| PCMCIA Ethernet adaptor   | PA2807U          | 75613-Q  | £112  |
| T2400 Sound Card          | HR-CD400         | 75615-Q  | £264  |
| T2400 Portable CD-ROM     | TA900CT          | 74600-Q  | £2715 |
| T2400/T6600 SCSI cable    | SCSICD400 Cable  | 76654-Q  | £40   |

#### CALL FOR OTHER ACCESSORIES

| DESCRIPTION | PROCESSOR | RAM | DISK  | SCREEN  | ITEM NO. | PRICE | DESCRIPTION      | PROCESSOR  | RAM | DISK  | SCREEN  | ITEM NO. | PRICE |
|-------------|-----------|-----|-------|---------|----------|-------|------------------|------------|-----|-------|---------|----------|-------|
| T1910       | 486SX/33  | 4MB | 200MB | MONO    | 72806-Q  | £845  | T2450CT          | DX4/75     | 8MB | 320MB | TFT COL | 76999-Q  | £2845 |
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| T2100CS     | 486DX2/50 | 4MB | 350MB | STN COL | 77283-Q  | £1610 | T4600C           | 486SL/33   | 4MB | 200MB | TFT COL | 91661-Q  | £2499 |
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| T2150CDT    | 486DX4/75 | 8MB | 520MB | TFT COL | 77287-Q  | £3395 | T4900CT          | PENTIUM/75 | 8MB | 810MB | TFT COL | 76570-Q  | £4585 |
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| 4/75CX M510/W 486DX4/75                | BMB/510MB | 77033-Q  | £2595 |
| 4/75CX M340/W 486DX4/75                | BMB/340MB | 75020-Q  | £2985 |
| 4/75CX M510/W 486DX4/75                | BMB/510MB | 75021-Q  | £3149 |
| 4/75CX M510/W 486DX4/75                | BMB/510MB | 77034-Q  | £3599 |
| 4/75CX M810/W 486DX4/75                | BMB/810MB | 77035-Q  | £3859 |
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| 400CX 486DX2/40 ACT. COL.              | 4MB/250MB | 76041-Q  | £1695 |
| CENTURIA 410                           | RAM/HD    | Item No. | Price |
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| 410CX 486DX2/509.5" COL STN 4MB/250MB  |           | 77011-Q  | £1695 |
| 410CX 486DX2/509.5" COL TFT 4MB/250MB  |           | 77012-Q  | £2199 |
| AERO with 3 1/2" External floppy drive | RAM/HD    | Item No. | Price |
| 4/25 MONO 486SX/25                     | 4MB/250MB | 77102-Q  | £845  |
| 4/33C COLOUR 486SX/33                  | 4MB/170MB | 75468-Q  | £1015 |
| 4/33C COLOUR 486SX/33                  | 4MB/250MB | 76021-Q  | £1185 |

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| 360 MD 2L 486SX/25 MONO                                | 4MB/340MB | 75424-Q  | £1525 |
| 360 DS3L 486DX2/250 COLOUR                             | 4MB/170MB | 76497-Q  | £1925 |
| 360 DS4L 486DX2/250 COLOUR                             | 4MB/340MB | 76498-Q  | £2049 |
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| 360 TF42L 486DX2/50 ACTIVE COL 4MB/340MB               |           | 76500-Q  | £2475 |
| 755 CD3 486DX4/100 ACTIVE COL 8MB/540 MB               |           | 76504-Q  | £5225 |
| 755 CD4 486DX4/100 ACTIVE COL 8MB/810MB                |           | 76505-Q  | £5675 |

## NEC VERSA

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| VERSA  | RAM/HD    | Item No. | Price |
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| S/33D 486SX/33 DUAL COL.                         | 4MB/210MB | 75359-Q  | £1065 |
| S/33C 486SX/33 TFT COL.                          | 4MB/210MB | 75192-Q  | £1185 |
| V/50D 486DX2/50 DUAL COL 4MB/250MB               |           | 75193-Q  | £1669 |
| V/50C 486DX2/50 TFT COL.                         | 4MB/340MB | 75361-Q  | £1995 |
| M/75D 486DX4/75 DUAL COL 8MB/340MB               |           | 75794-Q  | £2259 |
| M/75C 486DX4/75 TFT COL 8MB/540MB                |           | 75196-Q  | £2945 |
| M/100C 486DX4/100 TFT COL 8MB/540MB              |           | 75795-Q  | £3799 |
| M/100T 486DX4/100 TFT COL 8MB/540MB (16.7M COLS) |           | 75796-Q  | £4049 |
| M/100S 486DX4/100 SVGA LOCAL 8MB/540MB 77066-Q   |           |          | £4145 |
| P/75C PENTIUM/75 TFT COL 8MB/810MB               |           | 77013-Q  | £4445 |

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| TRAVELMATE 4000M                         | RAM/HD | Item No. | Price |
|--|--------|----------|-------|
| 486SX/50 9.5" Dual Scan Colour 4MB/200MB |        | 76087-Q  | £1789 |

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| 486DX2/50 9.5" Dual Scan Colour 4MB/340MB |           | 76583-Q | £1789 |
| 486DX2/50 8.4" TFT Colour                 | 4MB/455MB | 76584-Q | £2289 |
| 486DX4/75 9.5" Dual Scan Colour 4MB/455MB |           | 76090-Q | £2189 |
| 486DX4/75 8.4" TFT Colour                 | 4MB/340MB | 76091-Q | £2589 |
| 486DX4/75 8.4" TFT Colour                 | 4MB/455MB | 71812-Q | £2689 |
| 486DX4/100 9.5" TFT Colour                | 4MB/520MB | 76585-Q | £3489 |

## DESKTOPS

### COMPAQ

| PRESARIO                                 | RAM/HD    | Item No. | Price |
|--|-----------|----------|-------|
| 460 486SX2/66 14" SVGA LOCAL             | 4MB/270MB | 76223-Q  | £845  |
| 660 486SX2/66 14" SVGA LOCAL             | 4MB/200MB | 75347-Q  | £1075 |
| 720 486SX2/66 14" SVGA LOCAL             | 4MB/420MB | 76225-Q  | £1075 |
| 920 486SX2/66 14" SVGA LOCAL             | 8MB/420MB | 76227-Q  | £1225 |
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| PROLINEA       | RAM/HD    | Item No. | Price |
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| 4/33S 486 SX   | 4MB/340MB | 75325-Q  | £710  |
| 4/50S 486 SX 2 | 4MB/200MB | 75326-Q  | £697  |
| 4/50S 486 SX 2 | 4MB/340MB | 75327-Q  | £757  |
| 4/50 486 DX 2  | 8MB/200MB | 76559-Q  | £856  |
| 4/50 486 DX 2  | 8MB/340MB | 76560-Q  | £925  |
| 4/66 486 DX 2  | 8MB/200MB | 76561-Q  | £916  |
| 4/66 486 DX 2  | 8MB/340MB | 76562-Q  | £985  |
| 4/66 486 DX 2  | 8MB/525MB | 76563-Q  | £1059 |
| 4/100 486 DX 4 | 8MB/200MB | 75333-Q  | £1045 |
| 4/100 486 DX 4 | 8MB/340MB | 75334-Q  | £1115 |
| 4/100 486 DX 4 | 8MB/525MB | 75335-Q  | £1189 |

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| SK2/50+TV+RADIO 486SX2/50               |           |          |       |
| 14" SVGA LOC                            | 4MB/340MB | 76035-Q  | £1297 |
| DX2/66 486DX2/66 14" SVGA LOC 4MB/420MB |           | 76036-Q  | £1255 |
| FORCE                                   | RAM/HD    | Item No. | Price |
| 486SX2/50 14" SVGA LOC                  | 4MB/340MB | 76031-Q  | £829  |
| 486DX2/50 14" SVGA LOC                  | 4MB/340MB | 76032-Q  | £974  |
| 486DX2/66 14" SVGA LOC                  | 4MB/420MB | 76034-Q  | £1062 |
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Prices From £185

## ADI

| Model         | Size         | Temp Adj. | Item No. | Price |
|---------------|--------------|-----------|----------|-------|
| MicroScan 3V  | 14" 0.28     | x         | 71792-Q  | £185  |
| MicroScan 4V  | 15" 0.28 FST | x         | 72009-Q  | £259  |
| MicroScan 4GP | 15" 0.28 FST | ✓         | 72014-Q  | £269  |
| MicroScan 5EP | 17" 0.28 FST | ✓         | 72015-Q  | £469  |
| MicroScan SAP | 17" 0.28 FST | ✓         | 72017-Q  | £479  |

## COMPAQ

| Model           | Size | Display     | Item No. | Price |
|-----------------|------|-------------|----------|-------|
| 143800-502 LR   | 14"  | SVGA        | 71647-Q  | £215  |
| 1024 Colour LR  | 14"  | 1024x768 ni | 74934-Q  | £255  |
| 151FS Colour LR | 15"  | 1024x768 ni | 71641-Q  | £359  |
| 171FS Colour LR | 17"  | 1024x768 ni | 74789-Q  | £675  |

## GOLDSTAR

| Model     | Size   | Display      | Item No. | Price |
|-----------|--------|--------------|----------|-------|
| GS1462 DM | 14" LR | SVGA         | 75166-Q  | £169  |
| GS1520 DM | 15" LR | 1280x1024 ni | 75168-Q  | £259  |
| GS1725 DM | 17" LR | 1280x1024 ni | 75169-Q  | £499  |

## NEC

| Model | Size   | Display   | Item No. | Price |
|-------|--------|-----------|----------|-------|
| 2V    | 14" LR | MultiSync | 75625-Q  | £229  |
| XV-15 | 15" LR | MultiSync | 76970-Q  | £285  |
| XE-15 | 15" LR | MultiSync | 76971-Q  | £389  |
| XV-17 | 17" LR | MultiSync | 76972-Q  | £565  |
| XP-17 | 17" LR | MultiSync | 75973-Q  | £695  |
| XP-17 | 17" LR | MultiSync | 76974-Q  | £895  |
| XE-21 | 21" LR | MultiSync | 76975-Q  | £1355 |
| XP-21 | 21" LR | MultiSync | 76976-Q  | £1749 |

## PHILIPS

| Model               | Size   | Display      | Item No. | Price |
|---------------------|--------|--------------|----------|-------|
| 14C/7CM5279 LR      | 14"    | 1024 x 768   | 75318-Q  | £175  |
| 14A/4CM4279 LR      | 14"    | 1024x 768 ni | 75317-Q  | £210  |
| 15A/4CM8274 LR Bnl. | 15"    | 1024x768 ni  | 75654-Q  | £285  |
| 15B/                | 15" LR |              | 77094-Q  | £279  |
| 17A/                | 17" LR |              | 75656-Q  | £659  |
| 17B/                | 17" LR |              | 77095-Q  | £545  |
| 17C/4CM4770 LR      | 17"    | 1024x768 ni  | 75655-Q  | £445  |
| 17A/4CM6282 LR      | 17"    | 1280x1024 ni | 75656-Q  | £659  |
| 20B/                | 20" LR |              | 77096-Q  | £925  |

## TAXAN

| Model               | Size | Display     | Item No. | Price |
|---------------------|------|-------------|----------|-------|
| Ergovision 400 LR   | 14"  | 1024 x 768  | 75659-Q  | £209  |
| Ergovision 410 LR   | 14"  | 1024 x 768  | 75660-Q  | £205  |
| Ergovision 420 LR   | 14"  | 1280 x 1024 | 76300-Q  | £239  |
| Ergovision 580 LR   | 15"  | 1280 x 1024 | 72720-Q  | £319  |
| Ergovision 880 LR   | 17"  | 1280 x 1024 | 76301-Q  | £549  |
| Ergovision 885 LR   | 17"  | 1600 x 1200 | 93812-Q  | £669  |
| Ultravision 1075 LR | 20"  | 1280 x 1024 | 73923-Q  | £1349 |

CALL FOR GRAPHICS CARDS

## LCD PROJECTION PANELS

### 3M PROJECTION PANELS

| Model         | Colours    | Max. Res  | Item No. | Price |
|---------------|------------|-----------|----------|-------|
| 2080          | 16 Magenta | 720 x 480 | 91584-Q  | £975  |
| 4100 B Colour | 16 True    | 640 x 480 | 94532-Q  | £1365 |
| 4850 Colour   | 1.4m True  | 640 x 480 | 75475-Q  | £2045 |
| 6150 Colour   | 16.7m True | 640 x 480 | 76290-Q  | £2885 |
| 6450 Colour   | 16.7m True | 640 x 480 | 76291-Q  | £3315 |

CALL FOR ALL BRANDED ACCESSORIES

## LOW PRICES

| Model               | Item No. | Price |
|---------------------|----------|-------|
| BT DF100, Alpine    | 93669-Q  | *£195 |
| BT DF100, Dark grey | 93614-Q  | *£195 |
| BT DF300, Alpine    | 76115-Q  | *£325 |
| BT DF300, Dark grey | 76118-Q  | *£389 |
| Panasonic UF-V40    | 93938-Q  | *£275 |
| SAMSUNG SF 40       | 93801-Q  | *£199 |
| SAMSUNG SF 500      | 92016-Q  | *£198 |
| SAMSUNG SF150S      | 76268-Q  | *£239 |
| FAX/ANSWERING       |          |       |
| BT DF200 Alpine     | 93618-Q  | *£249 |

## FAX

## LOW PRICES

|                      |         |       |
|----------------------|---------|-------|
| BT DF200 Dark grey   | 93669-Q | *£249 |
| BT DF400, Dark grey  | 76116-Q | *£325 |
| BT DF400, Alpine     | 76117-Q | *£389 |
| Panasonic KX-F2300BE | 93685-Q | *£299 |
| Panasonic KX-F2400BE | 93682-Q | *£339 |
| Panasonic UF-V40     | 93939-Q | *£359 |

### PLAIN PAPER FAX-INKJET

|                |         |       |
|----------------|---------|-------|
| BT BF500       | 76119-Q | *£465 |
| BT BF800       | 93782-Q | *£795 |
| Canon B200S    | 93734-Q | *£415 |
| Canon B320     | 76342-Q | *£699 |
| Canon B340     | 76343-Q | *£825 |
| HP FAX-900     | 93761-Q | *£828 |
| HP FAX-950     | 93762-Q | *£748 |
| Panafax UF-321 | 93725-Q | *£649 |
| Panafax UF-322 | 93726-Q | *£769 |

### PLAIN PAPER FAX-LASER

|                |         |        |
|----------------|---------|--------|
| TXiFax 1000    | 93658-Q | *£825  |
| PANAFAX UF-745 | 93840-Q | *£1095 |
| PANAFAX UF-755 | 93804-Q | *£1399 |

### FAX WARRANTY

\* 12 Months on-site warranty.  
\* HP backed 12 month warranty  
Please note: All Panasonic Faxes include 12 months on-site cover

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...to the...  
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## TAPE STREAMERS

| INTERNAL                                   | Item No. | Price |
|--|----------|-------|
| Colorado                                   |          |       |
| Jumbo 0120, 250MB, 9.3MB/min, QIC-80       | 65252-Q  | £99   |
| Jumbo 680, 680MB, 9.3MB/min, QIC-3010      | 76333-Q  | £175  |
| Conner                                     | Item No. | Price |
| TapeStar 420, 420MB, 9.5MB/min, QIC-80     | 74448-Q  | £86   |
| TapeStar 850, 850MB, 9.5MB/min, QIC-3010MC | 76773-Q  | £179  |
| PARALLEL PORT                              | Item No. | Price |
| Colorado                                   |          |       |
| Jumbo 0120, 250MB, 9.3MB/min, QIC-80       | 72387-Q  | £199  |
| Jumbo 680, 680MB, 9.3MB/min, QIC-3010      | 76295-Q  | £285  |
| Conner                                     | Item No. | Price |
| TapeStar 420, 420MB, 9.5MB/min, QIC-80     | 74446-Q  | £215  |
| TapeStar 850, 850MB, 9.5MB/min, QIC-3010MC | 76774-Q  | £275  |

## SCANNERS

| DEXXA                                   | Item No. | Price |
|---|----------|-------|
| Model                                   |          |       |
| ColorMedia Hand Scanner WIN (with s/w)  | 76989-Q  | £114  |
| ColorOffice Page Scanner WIN (w/o s/w)  | 76990-Q  | £189  |
| EPSON (Parallel I/F)                    | Item No. | Price |
| G76500 PC, SCSI (inc. Photoshop LE)     | 73771-Q  | £485  |
| G76500 PC, Parallel (inc. Photoshop LE) | 73977-Q  | £427  |
| HEWLETT PACKARD                         | Item No. | Price |
| ScanJet 3P AT MONO                      | 75999-Q  | £344  |
| ScanJet 3P PS/2 MONO                    | 76001-Q  | £344  |
| ScanJet 11CX AT COLOUR                  | 76004-Q  | £680  |
| ScanJet 11CX PS/2 COLOUR                | 76005-Q  | £680  |
| SICOS COLOUR PAGE SCANNER - ISA         | 75165-Q  | £236  |
| LOGITECH                                | Item No. | Price |
| ScanMan EASYDUC                         | 74056-Q  | £98   |
| ScanMan 32 DOS/CATCHWORD                | 74438-Q  | £60   |
| ScanMan 32 WIN/CATCHWORD                | 74439-Q  | £56   |
| ScanMan PC COLOUR WIN                   | 92797-Q  | £169  |
| ScanMan PowerPage Parallel A4 Scanner   | 75084-Q  | £289  |
| ScanMan 256 WIN                         | 71064-Q  | £78   |

## UPS/ELECTRICAL PROTECTION

| APC SMART SCENES (LINE INTERACTIVE) |          |       |
|-------------------------------------|----------|-------|
| Model                               | Item No. | Price |
| 250VA Low Profile                   | 73132-Q  | £159  |
| 400VA Low Profile                   | 92617-Q  | £199  |
| 600VA Tower                         | 92477-Q  | £212  |
| 1250VA Tower                        | 92691-Q  | £495  |



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## TravelMate 4000M - Multimedia-ready Notebooks

### A NEW Dimension in Notebook Computing

**TEXAS  
INSTRUMENTS**



**MOVING  
MULTIMEDIA**

Texas Instruments powerful range of notebook PCs offers many unique features and is available at very competitive prices.

The **TravelMate 4000M** is a state of the art Multimedia PC offering the processing power and specifications to more than match its competitors. It is available with a variety of processor options and it is supplied with built in 16-bit sound card which is SoundBlaster Pro compatible, a 16-bit MIDI port, a fast SCSI II port plus an internal speaker and microphone. Versions are available with both colour dual scan and active matrix LCD displays. Plus it features an integrated pointing device conveniently located at the base of the keyboard. The above processing power and features make it ideal for use with multimedia presentations. If you wish to connect a CD-ROM drive the TravelMate 4000M offers a unique solution. Its Docking Station features an internal CD-ROM drive, stereo speakers and NiMH battery. All this is contained in a package weighing under 2kgs and it shares the same footprint as the 400M making this one of the neatest multimedia solutions available.

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CD-ROM Docking Station

| Model                  | 4000M SX2/50  | 4000M DX4/75   |
|------------------------|---|----------------|
| Processor (speed)      | 486SX2 (50MHz)  | 486DX4 (75MHz) |
| RAM                    | 4MB expandable to 20MB                                    |                |
| Hard drive             | 200MB or 340MB  | 455MB or 340MB |
| Floppy drive           | 3.5" 1.44MB   |                |
| Display                | Colour dual scan LCD or colour active matrix LCD          |                |
| Keyboard               | 84 key with integrated numeric keypad                     |                |
| Ports                  | Parallel, serial, SVGA, PS/2 mouse, SCSI II, audio in/out |                |
| Power supply           | 100-240V AC auto-sensing adaptor                          |                |
| Battery                | Rechargeable NiMH   |                |
| Operating System       | DOS 6.2 and Windows for Workgroups V3.11                  |                |
| Dimensions (W x D x H) | 279x216x49mm  |                |
| Weight                 | 2.9kg   |                |
| Warranty               | 12 months return-to-base                                  |                |

#### EXPANSION SLOTS

- 1 x PCMCIA type III or
- 2 x type II

#### ACCESSORIES SUPPLIED

- AC adaptor and mains lead
- Rechargeable NiMH battery
- DOS 6.2, Windows for Workgroups V3.11

Call for full  
DX2/50 & DX4/100  
specification

| TRAVELMATE 4000M     | DISPLAY               | RAM/HD    | ITEM NO. | PRICE |
|----------------------|-----------------------|-----------|----------|-------|
| 486SX2/50            | 9.5" Dual Scan Colour | 4MB/200MB | 76087-Q  | £1789 |
| 486SX2/50            | 8.2" TFT Colour       | 4MB/340MB | 76089-Q  | £2389 |
| 486DX2/50            | 9.5" Dual Scan Colour | 4MB/340MB | 76583-Q  | £1789 |
| 486DX2/50            | 8.4" TFT Colour       | 4MB/455MB | 76584-Q  | £2289 |
| 486DX4/75            | 9.5" Dual Scan Colour | 4MB/455MB | 76090-Q  | £2189 |
| 486DX4/75            | 8.4" TFT Colour       | 4MB/340MB | 76091-Q  | £2589 |
| 486DX4/75 <b>NEW</b> | 8.4" TFT Colour       | 4MB/455MB | 77175-Q  | £2689 |
| 486DX4/100           | 9.5" TFT Colour       | 4MB/520MB | 76585-Q  | £3489 |

| ACCESSORIES               | ITEM NO. | PRICE  |
|---------------------------|----------|--------|
| 4MB RAM Upgrade           | 76277-Q  | £170   |
| 16MB RAM Upgrade          | 76279-Q  | £1039  |
| Rechargeable NiMH Battery | 76280-Q  | £99    |
| CD-ROM Docking Station    | 76281-Q  | £620   |
| Deluxe Carry Case         | 76282-Q  | £49.50 |

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## OKI Special Printers at Special Prices

For a limited period you will be able to buy these well specified LED page printers at low GDI prices. Printing from DOS will still be an option.

### 400EX

- ✓ The new 400EX
- ✓ 4PPM
- ✓ 1MB RAM
- ✓ Low cost per copy
- ✓ PCL4/HP2 Emulation
- ✓ Small Foot Print
- ✓ One year On-Site Warranty

### 410EX

- ✓ Fully 600DPI Addressable
- ✓ 4PPM
- ✓ PCL5/HP3 Emulation
- ✓ Low cost per copy
- ✓ Small Foot Print
- ✓ One year On-Site Warranty



OL-400 EX  
**£278**  
Item No. 71495-Q

OL-410 EX  
**£384**  
Item No. 74833-Q

## Get All The Benefits of GDI Printing From Brother!!

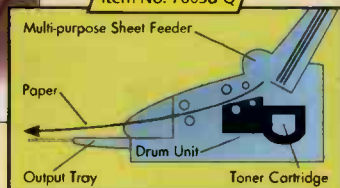


Brother's latest laser printer offers you GDI flexibility and with PCL 4 emulation the ability to work within a DOS environment. All you need is a Windows PC and it's GO GDI.

Brother HL-630

**£328**

Item No. 76038-Q



### FEATURES:

- ✓ 6ppm
- ✓ 300dpi resolution with Microfine toner
- ✓ 512Kb RAM (plus the RAM in your PC)
- ✓ HPIIP, Epson FX-850, IBM ProPrinter XL emulations
- ✓ All Windows fonts
- ✓ High Speed, Bi-Directional Parallel I/F

- ✓ Energy Star Compliant to help save the environment
- ✓ Straight Paper Path for problem free printing
- ✓ 200 A4 sheet input, 100 A4 sheet output
- ✓ 12 months Return-To-Base Warranty
- ✓ Optional On-Site Alternatives

SEE LINE LISTING FOR THE FULL BROTHER GDI RANGE

### INKJET

| CANON                                  | ITEM NO. | PRICE |
|--|----------|-------|
| BJ200EX                                | 77234-Q  | £189  |
| BJ230                                  | 91525-Q  | £238  |
| BJ300                                  | 71393-Q  | £344  |
| BJ330                                  | 71394-Q  | £389  |
| BJC-4000 Colour                        | 76084-Q  | £265  |
| BJC600 Colour                          | 73863-Q  | £328  |
| BJC800 Colour                          | 94805-Q  | £1065 |
| EPSON CALL FOR LATEST MODELS           |          |       |
| STYLUS 800+                            | 75400-Q  | £170  |
| STYLUS 1000 (A3)                       | 73842-Q  | £313  |
| STYLUS COLOUR                          | 75397-Q  | £328  |
| HEWLETT PACKARD CALL FOR LATEST MODELS |          |       |
| Deskjet 320                            | 76042-Q  | £166  |
| Deskjet 320 with Support               | 76263-Q  | £204  |
| Deskjet 320 & CSF                      | 76125-Q  | £183  |
| Deskjet 320 & CSF with Support         | 76264-Q  | £215  |
| Deskjet 540                            | 77071-Q  | £199  |
| Deskjet 540 with Support               | 77080-Q  | £235  |
| Deskjet 540 with Colour Kit            | 77325-Q  | £228  |
| Deskjet 540 + Colour + Support         | 77333-Q  | £259  |
| Deskjet 660C Col                       | 77073-Q  | £332  |
| Deskjet 660C Col with Support          | 77082-Q  | £341  |
| Deskjet 850C Col                       | 77075-Q  | £389  |
| Deskjet 850C Col with Support          | 77084-Q  | £411  |
| Deskjet 1600C Col                      | 77076-Q  | £845  |
| Deskjet 1600CM Col                     | 77077-Q  | £1245 |
| PaintJet XL300 Col                     | 71569-Q  | £1595 |
| STAR                                   |          |       |
| Star SJ144                             | 73981-Q  | £178  |

See Warranty Key Below

### CBP Mono & Colour Starter Kit

The CBP Printer Starter Kit provides you with everything you need to get up and running and contains:

- 1 x Parallel connecting cable
- 1 x Replacement consumable
- 1 x Ream A4 paper

We carry starter kits for all our top selling printers.

For Example:

Starter Kit for the HP Deskjet 520 is Item No. 72725-Q at £25.95 (individual items would cost £33.55. Save £7.60 plus carriage costs).

### LASER/THERMAL PRINTERS

| Make/Model                    | ITEM NO. | PRICE |
|-------------------------------|----------|-------|
| Brother HL-630 GDI, 6ppm      | 76038-Q  | £328  |
| Brother HL-630I GDI, 6ppm     | 76297-Q  | £378  |
| Brother HL-660 GDI            | 76595-Q  | £474  |
| Brother HL-1260 GDI           | 76596-Q  | £937  |
| Epson EPL-5200, 6ppm          | 71436-Q  | £464  |
| Epson EPL-5600, 6ppm          | 75350-Q  | £593  |
| Epson EPL-9000 A3 8ppm        | 76686-Q  | £1059 |
| Epson EPL-9000PS A3 8ppm      | 76687-Q  | £1359 |
| Fargo PrimeraPro Col. Therm.  | 76725-Q  | £1099 |
| HP LaserJet 4L, 4ppm          | 71690-Q  | £385  |
| HP LaserJet 4L & Support      | 73002-Q  | £479  |
| HP LaserJet 4ML               | 73283-Q  | £736  |
| HP LaserJet 5P, 6ppm          | 77078-Q  | £341  |
| HP LaserJet 5P with Support   | 77087-Q  | £341  |
| HP LaserJet 5MP, 6ppm         | 77079-Q  | £341  |
| HP LaserJet 5MP with Support  | 77088-Q  | £341  |
| HP LaserJet 4 Plus, 12ppm     | 75158-Q  | £939  |
| HP LaserJet 4 Plus & Support  | 75159-Q  | £1089 |
| HP LaserJet 4M Plus, 12ppm    | 75106-Q  | £1261 |
| HP LaserJet 4M Plus & Support | 76463-Q  | £1405 |
| HP LaserJet 4V 16ppm,         | 76029-Q  | £1372 |
| HP LaserJet 4V with Support   | 76131-Q  | £1575 |
| HP LaserJet 4MV 16ppm,        | 76030-Q  | £1999 |
| HP LaserJet 4MV & Support     | 76464-Q  | £2175 |
| HP LaserJet 4Si 16ppm         | 71692-Q  | £2085 |
| HP LaserJet 4Si with Support  | 76113-Q  | £2519 |
| HP LaserJet 4Si/MX, 16ppm     | 71756-Q  | £2966 |
| HP LaserJet 4Si/MX & Support  | 76462-Q  | £3385 |
| HP Color LaserJet A3          | 76698-Q  | £4285 |

### PRINTER MANUFACTURER'S WARRANTY DETAILS

† = Does not include On-Site Maintenance \* = 1 Year On-Site Maintenance  
\*\* = 2 Year On-Site Maintenance \*\*\* = 3 Year On-Site Maintenance

Please note: Panasonic on-site warranty is limited to the UK Mainland

|                                   |         |          |
|-----------------------------------|---------|----------|
| HP Color LaserJet A3 with support | 77057-Q | £3295    |
| Man Tolly T9005, 5ppm             | 93749-Q | £325     |
| Man Tolly T-Win GDI, 4ppm         | 75455-Q | £245 LOW |
| NEC SuperScript Color             |         |          |
| 3000GDI Thermal                   | 76775-Q | £654     |
| NEC SuperScript 610+, 6ppm        | 76558-Q | £289     |
| NEC SuperScript 660, 6ppm         | 76565-Q | £405     |
| NEC SuperScript 660i, 6ppm        | 76566-Q | £545     |
| OKI OL400ex, 4ppm                 | 71495-Q | £278     |
| OKI OL410ex, 4ppm                 | 74833-Q | £384     |
| Panasonic KXP4400, 4ppm           | 72716-Q | £276     |
| Panasonic KXP4401, 4ppm           | 75743-Q | £296     |
| Panasonic KXP4430, 5ppm           | 94780-Q | £484     |
| Panasonic KXP4440, 10ppm          | 74084-Q | £706     |
| QMS CS210 - Color Thermal         | 73495-Q | £1895    |
| QMS CS230 - Color Thermal         | 73496-Q | £5475    |
| QMS Magicolor 24MB                | 76672-Q | £7245    |
| Star WinType 4000 GDI 4ppm        | 75478-Q | £293     |
| Star WinType 800C Thermal         | 75700-Q | £595     |

See Warranty Key Below

### CBP Starter Kit

The CBP Printer Starter Kit provides you with everything you need to get up and running and contains:

- 1 x Parallel connecting cable
- 1 x Replacement consumable
- 1 x Ream A4 paper

We carry starter kits for all our top selling printers.

For Example:

Starter Kit for the HP LaserJet 4L is Item No. 76128-Q at £54.95 (individual items would cost £59.95. Save £5.00 plus carriage costs)

### DOT MATRIX PRINTERS

| EPSON                | ITEM NO. | PRICE |
|----------------------|----------|-------|
| LX-300 9 pin         | 75451-Q  | £90   |
| LX-300 Colour Kit    | 75452-Q  | £29   |
| FX-870 9 Pin         | 71036-Q  | £224  |
| FX-1170 9 Pin        | 71018-Q  | £282  |
| LQ300 24 Pin         | 76651-Q  | £142  |
| LQ-570+ 24 Pin       | 71610-Q  | £186  |
| LQ-870 24 Pin        | 94019-Q  | £352  |
| LQ-1070+ 24 Pin      | 73860-Q  | £283  |
| LQ-1170 24 Pin       | 94020-Q  | £402  |
| DFX-5000 9-Pin       | 71508-Q  | £1125 |
| DFX-8000 9-Pin       | 73463-Q  | £1875 |
| DLG-3000 24 Pin      | 75959-Q  | £672  |
| NEC                  |          |       |
| PinWriter P2Q 24 Pin | 72782-Q  | £98   |
| PinWriter P3Q 24 Pin | 75589-Q  | £178  |
| PinWriter P72 24 Pin | 71499-Q  | £372  |
| OKI                  |          |       |
| ML321 9 Pin          | 71317-Q  | £365  |
| ML395B 24 Pin        | 71795-Q  | £635  |
| ML520 9 Pin          | 71482-Q  | £355  |
| ML521 9 Pin          | 71483-Q  | £395  |
| ML591 24 Pin         | 71020-Q  | £499  |
| PANASONIC            |          |       |
| KXP1150 9 Pin        | 72974-Q  | £89   |
| KXP3696 9 Pin        | 76648-Q  | £272  |
| KXP2023 24 Pin       | 73145-Q  | £110  |
| KXP2135C 24 Pin      | 76144-Q  | £128  |
| KXP3626 24 Pin       | 76649-Q  | £268  |
| STAR                 |          |       |
| LC-90 9-Pin          | 76351-Q  | £79   |
| LC100 9 Pin Col      | 92667-Q  | £89   |
| LC15 9 Pin           | 71797-Q  | £177  |
| LC24300              | 74066-Q  | £179  |
| LC2415 Mk II         | 72783-Q  | £233  |
| LC2420 Mk II         | 72290-Q  | £113  |
| LC-240 24 Pin Mono   | 76354-Q  | £90   |
| LC-240 24 Pin Colour | 76355-Q  | £103  |

See Warranty Key Below

### CALL FOR PLOTTER PRICES

Do you need a connecting cable or spare ribbons? Buy them with your printer and save money!!

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# Computers by Post

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## The New Kyocera FS-400 - The Advanced Personal Page Printer That Saves On Print Costs

# KYOCERA

A compact 4ppm personal page printer that offers full system printer capabilities and savings on print costs due to its cartridge-free design.

Kyocera are the company which introduced low-cost printing, the FS-400 is a low cost printer that offers unrivalled potential for small businesses or organisations needing a low-volume centralised printing resource. The only consumable needed is toner, cartridge waste is eliminated and page print costs reduced to around 0.5p per page.

**ECOSYS**

### STANDARD FEATURES:

**Output:** 4ppm

**Emulations:** HPLJIII, IBM X24E, Epson LQ-850

**RAM:** 1MB

**Resolution:** 300 x 300dpi / 300 x virtual 1200 IRt

**Interfaces:** Centronics Parallel plus high speed option I/O port

**Fonts:** 79 bitmapped, 13 scalable

**Small footprint:**

**Dimensions:** 353W x 350D x 173Hmm

**Input Trays:** 1 x 100 sheet Universal

**Output Trays:** 1 x 100 sheet face down



FS-400  
**£435**  
Item No. 77063-Q

**OTHER MEMBERS OF THE ECOSYS COST-CUTTING, PLANET FRIENDLY PRINTER RANGE**

FS-1550  
**£875**  
Item No. 76258-Q

FS-1600  
**£469**  
Item No. 76259-Q



**Warranty:** 12 months (return to base)

**Top brand, quality printers designed with your specification in mind and at a price that will be within your budget.**

**TEXAS INSTRUMENTS**

## Network Printers microLaser PowerPro High Performance Printing!

## Personal Printers microMarc Color Thermal InkJet Printer High Quality Colour at an Affordable Price

### Features:

- ✓ Max 12ppm
- ✓ PCL5 emulation
- ✓ PostScript Level 2
- ✓ 6MB RAM (expandable to 22MB)
- ✓ 25MHz RISC processor (16KB Cache)
- ✓ Max 600 x 600 dpi
- ✓ Standard bi-directional parallel and AppleTalk I/Fs
- ✓ Optional Pro Network I/F for NetWare, TCP/IP, MS LAN Manager and IBM LAN Server support
- ✓ 12 months return-to-base warranty



Power Pro  
**£1099**  
Item No. 73546-Q

### Features:

- ✓ Up to 5ppm mono
- ✓ Up to 1ppm colour
- ✓ Max 600 x 300dpi (resident fonts)
- ✓ HP DeskJet compatible with PCL3
- ✓ Parallel and serial I/F
- ✓ 128 KB receiver buffer
- ✓ Auto sheet feeder (120cap)
- ✓ 12 months return-to-base warranty



microMarc Color  
**£265**  
Item No. 73545-Q

### TI - INKJET/LASER PRINTERS

| DESCRIPTION                              | Item No. | Price | DESCRIPTION                             | Item No. | Price | DESCRIPTION                           | Item No. | Price |
|--|----------|-------|---|----------|-------|---------------------------------------|----------|-------|
| microMarc Color, max 5ppm Thermal Inkjet | 73545-Q  | £265  | microLaser Pro 600-PS23, max 8ppm Laser | 73547-Q  | £859  | microLaser Pro E, max 12ppm Laser     | 65325-Q  | £969  |
| microLaser 600, max 5ppm Laser           | 73550-Q  | £595  | microLaser Pro 600-PS65, max 8ppm Laser | 76579-Q  | £999  | microLaser Power Pro, max 12ppm Laser | 73546-Q  | £1099 |

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## MULTIMEDIA

### CD ROM DRIVES

#### Aztech CDA268-031 EP IDE CD-ROM

IDE CD-ROM Drive

**£85**

Item No. 72234-Q

- ✓ Easy to install
- ✓ Internal, double speed
- ✓ 350ms average access time
- ✓ 337ms seek time
- ✓ Audio CD compatible
- ✓ Tray loading mechanism
- ✓ Low noise levels
- ✓ Ultra CD cache
- ✓ Cables & Software provided

| Aztech   | Item No. | Price |
|--|----------|-------|
| CDA 268-031, 350ms, 305KB/sec Internal, IDE                      | 72234-Q  | £85   |
| CDA 486-011, quad speed, IDE                                     | 76027-Q  | £135  |
| Mitsumi FX-300, 250ms, 450KB/sec, Internal, IDE                  | 76761-Q  | £122  |
| Mitsumi FX-400, 230ms, 600KB/sec, Internal, IDE                  | 77113-Q  | £135  |
| NEC (SCSI 1 & 2 I/F)   |          |       |
| 3Xp + Portable   | 76194-Q  | £245  |
| 4xe External   | 76196-Q  | £369  |
| 4xi Internal   | 76195-Q  | £259  |
| NEC (SCSI 1 & 2 I/F KITS)  |          |       |
| AT ISA Bus   | 73050-Q  | £41   |
| Parallel Port  | 72930-Q  | £85   |
| PANASONIC (without I/F kit)                                      |          |       |
| CR-503, 320ms, 306KB/sec, Internal SCSI-2                        | 75665-Q  | £113  |
| CR-562, 320ms, 306KB/sec, Internal, ISA                          | 75664-Q  | £93   |
| PIONEER  |          |       |
| DRM 104x, Internal, 190ms, 614KB/sec, SCSI-2                     | 76394-Q  | £195  |
| DRM-604X, 300ms, 614KB/sec External                              | 75175-Q  | £769  |
| SONY (with IDE I/F)  |          |       |
| CDU-55E, Internal, 250ms, 300KB/sec, IDE                         | 76982-Q  | £109  |
| CDU-55S, Internal, 250ms, 300KB/sec, SCSI-2                      | 76983-Q  | £110  |
| TOSHIBA  |          |       |
| CD 400A Portable (SCSI-2 I/F kit inc.)                           | 75615-Q  | £264  |
| XM-3601B, 150ms, min 660 KB/sec, Internal, SCSI-2 (w/out I/F)    | 77278-Q  | £219  |
| XM-3601B, 150ms, min 660 KB/sec, External, SCSI-2 (w/out I/F)    | 77279-Q  | £289  |
| KT-3601BA, 150ms, min 660 KB/sec, Internal, SCSI-2 (with AT I/F) | 77404-Q  | £265  |
| KT-3601SA, 150ms, min 660 KB/sec, Internal, SCSI-2 (with AT I/F) | 77405-Q  | £312  |

### SOUND CARDS, SPEAKERS & UPGRADE KITS

|  |         |      |
|--|---------|------|
| <b>CREATIVE LABS (12 months warranty)</b>          |         |      |
| SoundBlaster Pro Value, 8-bit                      | 75338-Q | £55  |
| SoundBlaster 16 Value, 16-bit                      | 75374-Q | £65  |
| SoundBlaster 16 Multi-CD Value, 16-bit             | 75375-Q | £89  |
| SoundBlaster 16 Multi-CD Value, 16-bit with ASP    | 75928-Q | £110 |
| SoundBlaster 16 SCSI-2 Value, 16-bit               | 75376-Q | £110 |
| SoundBlaster 16 SCSI-2 Value, 16-bit with ASP      | 75929-Q | £132 |
| SoundBlaster AWE32                                 | 91926-Q | £171 |
| Midi Adaptor (1 in, 1 out)                         | 74342-Q | £20  |
| <b>MICROSOFT SOFTWARE</b>                          |         |      |
| MS Sound System 2 (3 1/2" disks)                   | 31988-Q | £40  |
| ORCHID (4 year warranty)                           |         |      |
| SoundWave 32, 16-bit + speakers + mic              | 75170-Q | £125 |
| <b>SOUND GALAXY</b>                                |         |      |
| Waverider 32+(inc. mic., headphones & software)    | 76540-Q | £95  |
| BXII Extra, 8 bit sound (inc. Speakers & Software) | 76022-Q | £37  |
| Pro 16, 16 bit sound; (4 software titles)          | 76023-Q | £63  |

|  |         |      |
|--|---------|------|
| Nova 16 Extra, 16 bit sound; (headphones, mic & 15 software titles)  | 76024-Q | £77  |
| <b>CREATIVE LABS</b>   |         |      |
| Pro Digital Speakers   | 75780-Q | £28  |
| Screenbeat speakers for Sound Blaster only   | 74625-Q | £15  |
| Creative Labs Multimedia Office-Kit  | 75994-Q | £375 |
| SoundBlaster CD 16 Discovery Kit   | 75398-Q | £219 |
| SoundBlaster Digital Edge 3x   | 76241-Q | £355 |
| <b>SOUND GALAXY</b>  |         |      |
| Voyager Multimedia Kit (dual Drive, 8 bit ISA I/F 16 bit Sound Card, microphone, Speakers, Cable, 15 software & 7 CD titles) | 76026-Q | £210 |
| Explorer Multimedia Kit (external dual Drive, 8 bit ISA I/F, Sound Card, Speakers, Cable & 4 CD titles)                      | 76028-Q | £229 |

### VIDEO CAPTURE CARDS

|                               |         |      |
|-------------------------------|---------|------|
| HAUPPAUGE (See feature above) |         |      |
| Win/TV Celebrity              | 75197-Q | £262 |
| Win/TV Cinema                 | 75012-Q | £182 |
| VIDEOLOGIC                    |         |      |
| Captivator +VFW               | 74780-Q | £164 |

SEE SOFTWARE SECTION FOR CD TITLES

### DIGITISERS & PLOTTERS

**Summagraphics.**

**NEW**



Summagraphics brings you their new range of colour and mono Large format InkJet Plotters. Prices so competitive offering you colour where the competition price their mono.

#### SummaJet 2 Series Plotter

The SummaJet offers the kind of cost-effective plotter solution with flexible upgrade options required by todays CAD professionals

- ✓ Increased plotter productivity
- ✓ Equipped for Workgroup use
- ✓ 12 months On-Site warranty
- ✓ Reduce operating costs
- ✓ Easy upgrade.

#### THE PRODUCT RANGE

| Make/Model         | ITEM NO. | PRICE |
|--------------------|----------|-------|
| SummaSketch III A4 | 72547-Q  | £229  |
| SummaSketch III A3 | 72548-Q  | £435  |
| Summagrid IV 1824  | 76046-Q  | £955  |
| Summagrid IV 2436  | 76047-Q  | £1265 |
| HiPlot 7100        | 76048-Q  | £1545 |
| HiPlot 7200        | 76049-Q  | £1975 |
| SummaJet A1 mono   | 71130-Q  | £2235 |
| SummaJet A0 colour | 71285-Q  | £3245 |

### MODEMS

#### INTERNAL/PCMCIA

|   |         |       |
|---|---------|-------|
| <b>EUROVIVA - 5 year warranty</b>         |         |       |
| 14.4I-V32bis, ISA, FAX                    | 75038-Q | £130  |
| <b>HAYES</b>                              |         |       |
| Optima 144 PCMCIA 2.II V32bis, FAX        | 76129-Q | £199  |
| <b>PACE - 5 year warranty</b>             |         |       |
| MICROLIN FX 32 +, PC 8-BIT ISA            |         |       |
| V32bis, FAX                               | 73889-Q | £129  |
| MICROLIN FX NB32 PCMCIA 2.II              | 74703-Q | £180  |
| V32bis, FAX                               |         |       |
| <b>PSION DACOM - 2 year warranty</b>      |         |       |
| GOLD CARD QUAD PCMCIA 2.II                | 74971-Q | £139  |
| V22bis, FAX                               |         |       |
| GOLD CARD V32bis PCMCIA 2.II-V32bis, FAX  | 74526-Q | £195  |
| GOLD CARD V.F.C. PCMCIA 2.II - V.FAST FAX | 76132-Q | £269  |
| <b>TOSHIBA - 1 year warranty</b>          |         |       |
| ADVANCED PCMCIA 2.II-V32bis, FAX          | 71814-Q | £215  |
| <b>WORLDPORT - 5 year warranty</b>        |         |       |
| 2496 PCMCIA 2.II-V22bis, FAX              | 74301-Q | £129  |
| DUAL STANDARD CELLULAR PCMCIA 2.II        | 76611-Q | £189  |
| <b>US ROBOTICS - 5 year warranty</b>      |         |       |
| SPORTSTER 14.4 WITH FAX V32bis, FAX       | 91885-Q | £126  |
| SPORTSTER 28.8 WITH FAX, V.FAST ISA       | 76714-Q | £CALL |
| <b>ZOOM - 5 year warranty</b>             |         |       |
| ZOOM 14.4I V32bis, FAX                    | 74186-Q | £125  |

**Hauppauge!**

## Video Capture Cards

**view Teletext, TV or video on your PC at home or at work**

### Features:

- ✓ SVGA compatible; requires feature connector
- ✓ Resolution support - from 640 x 480 up to 800 x 600
- ✓ Video input for Camcorder, Video Recorder connection
- ✓ 122 Channel PAL tuner with on-board Teletext
- ✓ DDE and Subpage support allows fast Teletext information retrieval
- ✓ 4.1.1 YUV colour separation for home presentations
- ✓ Audio-Line-Out requiring no extra sound card
- ✓ Video for Windows Compatible
- ✓ US designed and manufactured

### Win/TV Cinema



Win/TV Cinema

**£182**

Item No. 75012-Q

### Win/TV Celebrity

### Features:

- ✓ 16.7m colours
- ✓ Video-out option
- ✓ SVGA compatible; no feature connector required
- ✓ Resolution from 640 x 480 up to 1280 x 1024, 100Hz
- ✓ 122 channel PAL tuner with on-board Teletext
- ✓ DDE and Subpage support allows fast Teletext information retrieval
- ✓ Reuters 1000 ready (subscription service available on CNN text)
- ✓ 4.2.2 YUV colour separation for high impact presentations
- ✓ Two additional video inputs and Audio-Line-Out requiring no extra sound card
- ✓ Full-screen AVI playback
- ✓ US designed and manufactured



Win/TV Celebrity

**£262**

Item No. 75197-Q

**CELEBRITY**  
Full Working copy of  
OS/2 Warp available  
FREE upon registration

## SPECIAL APRIL OFFER

**£10 Our Price Voucher with every Celebrity board**

Limited offer while stocks last

### PORTABLE

|                                 |         |      |
|---------------------------------|---------|------|
| <b>PACE - 5 year warranty</b>   |         |      |
| MICROLIN QUAD FX V22bis, FAX    | 94835-Q | £88  |
| MICROLIN FX 32 PLUS V32bis, FAX | 72169-Q | £148 |
| MOBI-FAX 24                     | 75580-Q | £74  |
| MOBI-FAX 144                    | 76397-Q | £94  |
| <b>ZOOM - 5 year warranty</b>   |         |      |
| ZOOM 14.4X - V32bis, FAX        | 74185-Q | £125 |

### DESKTOP

|   |         |      |
|---|---------|------|
| <b>CRAY (was DOWTY) - 1 year warranty</b>                                     |         |      |
| QUATRO 144 V32bis, FAX  | 72953-Q | £245 |
| <b>EUROVIVA - 5 year warranty</b>   |         |      |
| EUROVIVA 14.4 V32bis FAX  | 72919-Q | £134 |
| <b>HAYES - 2 year warranty</b>  |         |      |
| ACCURA 144, V32bis, FAX   | 75092-Q | £139 |
| ACCURA 288, V.FAST, FAX   | 75093-Q | £174 |
| OPTIMA 144, V32bis FAX  | 74774-Q | £249 |
| OPTIMA 288, V.FAST FAX  | 74775-Q | £339 |
| OPTIMA 288 VALUE PACK   | 76270-Q | £645 |
| ESP COMMUNICATIONS ACCELERATOR V2.0 (16-BIT SERIAL BOARD, ISA PC'S & WINDOWS) | 74307-Q | £59  |
| <b>MULTITECH - 2 year warranty</b>  |         |      |
| MT1432BLK V32bis, FAX   | 91011-Q | £312 |
| MT1932 ZDXX V32bis, FAX   | 74941-Q | £112 |
| MT2834BLK V.F.C. - V.FAST, FAX  | 76234-Q | £395 |
| <b>PACE - 5 year warranty</b>   |         |      |
| LINNET QUAD V22bis, FAX   | 74345-Q | £85  |
| LINNET 32 PLUS V32bis, FAX  | 74346-Q | £155 |
| LINNET 32 PLUS V32bis, VOICE/FAX  | 76592-Q | £149 |
| LINNET 34 V.F.C. - V.FAST FAX   | 75661-Q | £257 |
| ULTRALINK 32 PLUS V32bis  | 94527-Q | £312 |
| <b>US ROBOTICS - 5 year warranty</b>  |         |      |
| SPORTSTER 14.4 WITH FAX V32bis, FAX   | 91017-Q | £125 |
| SPORTSTER 28.8 WITH FAX   | 76610-Q | £192 |
| COURIER V.F.C. PLUS DUAL STD-V.FAST, FAX                                      | 75573-Q | £258 |

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## APRIL SPECIAL

**SPORTSTER 28.8 + FAX**



**£192**

Item No. 76610-Q

**FREE £10 Whitbread Leisure Voucher (Pizza Hut, Threshers & Beefeater, et al)**

Limited offer while stocks last



**SPORTSTER 14.4 + FAX**

**£125**

Item No. 91017-Q

**FREE £5 Whitbread Leisure Voucher (Pizza Hut, Threshers & Beefeater, et al)**

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#### Microsoft Encarta '95

- The complete interactive multimedia encyclopedia
- ✓ based on 28 volume encyclopedia
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- ✓ 250 interactive charts & tables
- ✓ video and animation included
- ✓ £30 cashback for owners of previous versions



CD  
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- ✓ 20 full motion video clips
- ✓ 4,000 star biographies and filmographies
- ✓ includes 1994 films



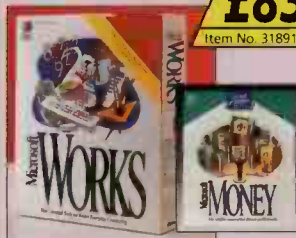
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CD  
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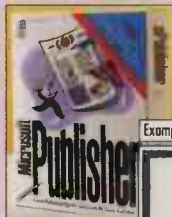
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Windows

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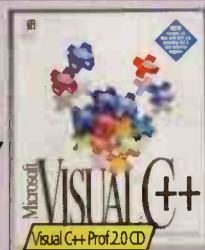
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Plus a voucher for you  
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Paper Direct™

- ✓ 10 Letterheads
  - ✓ 10 Brochure Mailers (great for menus etc.)
  - ✓ 40 Postcards
  - ✓ 30 compliment slips
- Offers apply to promotion  
packs only and are available  
while stock lasts

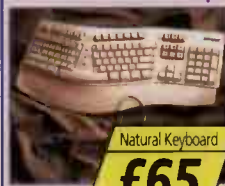
#### Microsoft Visual C++ Professional 2.0 on CD-ROM

- "On the road to Windows 95"
- ✓ 16-Bit and 32-Bit development
  - ✓ MFC 3.0 and Wizard support for OLE, OLE Custom Controls and ODBC
  - ✓ New project manager and just-in-time debugging



**£249**  
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#### The Natural Keyboard 'Responsibly Designed for Comfort and Made to Simplify Windows'



The Microsoft Natural  
Keyboard with  
'IntelliType' is a new  
innovative product  
which has been  
manufactured after  
years of user research.

**£65**  
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#### Microsoft Home Mouse

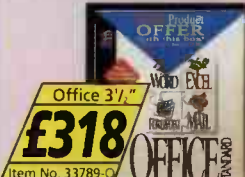
The Microsoft Home  
Mouse is from the makers  
of the 'legendary' Mouse  
2.0. It is designed for use  
with PCs at home at an  
affordable price.



HomeMouse  
**£27**  
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### Microsoft Office & Office Pro

The Microsoft office is already the easiest to use and most successful software for business and you now get even more with a choice of a complementary bonus product direct from Microsoft.



Office 3 1/2"  
**£318**  
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1. Buy your selected Microsoft Office product from CBP
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5. The Microsoft Upgrade Centre will despatch the bonus to you within 28 days. All applications included in Office & Office Pro or available as individual applications and can be found in our line listing section. Offer limited to single user full packaged product

Offer extended  
until end of  
May '95

### Upgrading to Microsoft® Software

#### The Microsoft Way



Compliance checking product  
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loaded on your system in some way – on floppy, on local hard disk  
or on your network. A technical upgrade is performed which  
updates and augments the existing files which comprise the  
application – the old files must be available or the upgrade will not  
take place.

**How to Upgrade:** Purchase the required CCP upgrade. This  
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you'll quickly be in control of the latest from Microsoft.

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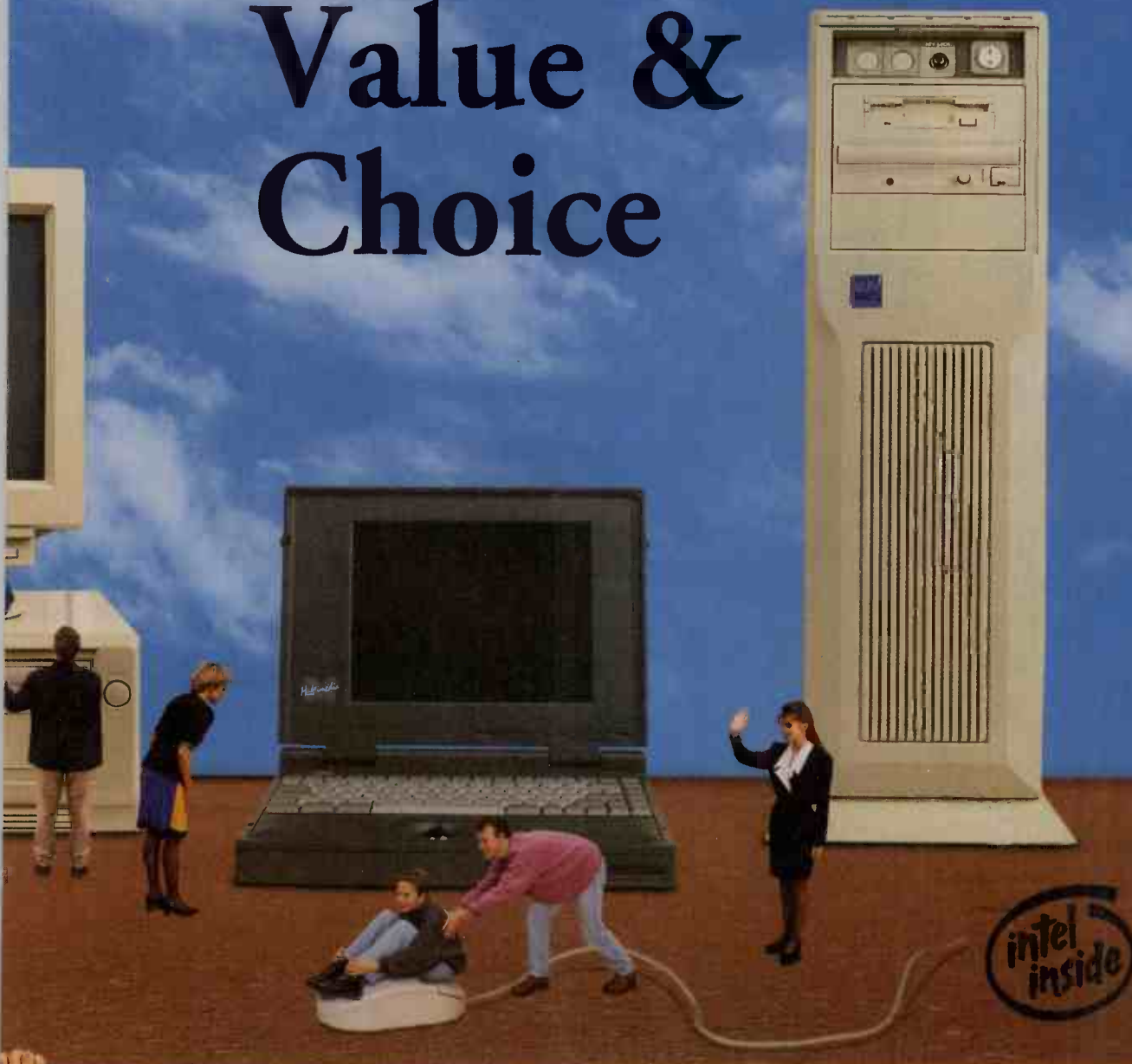
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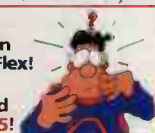
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|------------------------------------|------|
| IDE Controller                     | £35  |
| Future Domain SCSI PCI Controller  | £120 |
| Promise DC500 IDE Controller (PCI) | £195 |
| DC-5030 IDE Cache Cont (OK) PCI    | £105 |
| DC-5040 SCSI Cache Ct. 4HDD OK PCI | £183 |



# Mail Order Made Easy!

## NETWORKING

### 3COM

|   |      |
|---|------|
| Etherlink III 3C509 ISA BNC                       | £74  |
| Etherlink III 3C509 ISA RJ45                      | £74  |
| Etherlink III 3C509 ISA RJ45/BNC                  | £84  |
| Etherlink III 3C509 ISA either BNC or RJ45 5-pack | £337 |
| Etherlink III 3C509 ISA RJ45/BNC combo 5-pack     | £397 |
| Etherlink III 3C579 EISA BNC                      | £139 |
| Etherlink III 3C579 EISA RJ45                     | £139 |
| Etherlink III 3C589 PCMCIA RJ45                   | £139 |
| E'link III 3C589 PCMCIA RJ45/BNC                  | £139 |

### DLink

|                                  |      |
|----------------------------------|------|
| DE6200CT Pocket Adaptor BNC/TP   | £144 |
| DE6201 Pocket Adaptor Token Ring | £343 |
| DE650C PCMCIA Ethernet BNC       | £138 |
| DE220 Ethernet Card BNC/AUI      | £68  |
| DE220TP Ethernet Card AUI/TP     | £68  |
| DE220CAT E'net Card BNC/TP/AUI   | £88  |
| DE320MCA Ethernet Card TP/AUI    | £98  |
| DE400M EISA E'net Cd. BNC/TP/AUI | £147 |
| DE500CAT VESA E'net BNC/TP/AUI   | £198 |
| DE530CAT PCI Ethernet BNC/TP     | £98  |

### SMC

|                                   |      |
|-----------------------------------|------|
| Elite Ultra ISA RJ45              | £65  |
| Elite Ultra ISA BNC               | £65  |
| Elite ISA Combo RJ45 & BNC        | £74  |
| Elite Ultra ISA RJ45 6-pack       | £375 |
| Elite Ultra ISA BNC 6-pack        | £375 |
| Elite Ultra ISA BNC & RJ45 6-pack | £444 |
| Elite Ultra EISA 32C BNC & RJ45   | £166 |

### Novell

|                                   |      |
|-----------------------------------|------|
| NE1000 8Bit ISA                   | £74  |
| NE2000 Plus 16Bit BNC             | £74  |
| NE2000 Plus 16Bit RJ45            | £74  |
| NE2000 Plus 16Bit Combo Card      | £84  |
| NE2000 Plus 5-pk 16Bit RJ45 & BNC | £340 |

### Intel

|                                   |      |
|-----------------------------------|------|
| Etherexpress ISA 16 BNC           | £73  |
| Etherexpress ISA 16 RJ45          | £73  |
| Etherexpress ISA Flash Combo      | £89  |
| Etherexpress ISA 16 BNC 5-pack    | £384 |
| Etherexpress ISA 16 RJ45 5-pack   | £384 |
| Etherexpress ISA Flash Combo 5-pk | £445 |

### Repeaters

|                                |      |
|--------------------------------|------|
| D Link Repeater 2 Port BNC/AUI | £295 |
| D Link Repeater 4 Port BNC/AUI | £395 |
| D Link Repeater 8 Port BNC/AUI | £444 |

### UPS

|                          |      |
|--------------------------|------|
| APC BK2501-250 VA Backup | £89  |
| APC BK4001-400 VA Backup | £135 |
| APC BK6001-600 VA Backup | £189 |
| APC BK9001-900 VA Backup | £334 |
| APC 12501-1250 VA Backup | £425 |
| APC AP4001-400 VA Smart  | £244 |
| APC AP6001-600 VA Smart  | £264 |
| APC AP9001-900 VA Smart  | £445 |
| APC 12501-1250 VA Smart  | £560 |
| APC AP2001-2000 VA Smart | £925 |

## NETWORK SOFTWARE

|                                       |        |
|---------------------------------------|--------|
| Novell Personal Network               | £44    |
| Novell Personal Network 5-user        | £185   |
| Novell Personal Network Starter Kit   | £135   |
| Novell Personal Network Expansion Kit | £130   |
| Novell Network 3.12 5-user            | £410   |
| Novell Network 3.12 10-user           | £1,167 |
| Novell Network 3.12 25-user           | £1,440 |
| Novell Network 3.12 100-user          | £1,835 |
| Novell Network 4.02 5-user            | £529   |
| Novell Network 4.02 10-user           | £1,348 |
| Novell Network 4.02 25-user           | £1,797 |
| Novell Network 4.02 100-user          | £3,379 |
| Novell Network 4.02 250-user          | £5,999 |

## NETWORKING BACKUP SOFTWARE

|                     |       |
|---------------------|-------|
| ArcSolo             | £85   |
| ArcServer 5-User    | £185  |
| ArcServer 10-User   | £371  |
| ArcServer 35-User   | £651  |
| ArcServer 50-User   | £749  |
| ArcServer 100-User  | £888  |
| ArcServer 250-User  | £1099 |
| ArcServer 500-User  | £2185 |
| ArcServer 1000-User | £4345 |

## KINGSTON NETWORKING

### Kingston NE2000 Network cards:

- 100% Compatible
- Bus mastering (option)
- 5 Year Warranty

|                   |        |
|-------------------|--------|
| 2000 RJ45 Single  | £29.95 |
| 2000 BNC Single   | £37.95 |
| 2000 Combo Single | £39.95 |



## COREL SOFTWARE

|                            |      |
|----------------------------|------|
| Corel SCSI Version 2       | £67  |
| Corel SCSI Network Manager | £279 |

## SCSI CABLES

|                                  |     |
|----------------------------------|-----|
| Centronik 50 to Centronik 50     | £19 |
| Centronik 50 to Centronik 25-pin | £24 |
| Centronik 50 to Micro-D 50       | £38 |
| Micro-D 50 to Micro-D 50         | £39 |

## SPEAKERS

|                          |     |
|--------------------------|-----|
| Pro Digital Speakers     | £29 |
| Creative 20Watt Speakers | £80 |
| Creative 9Watt Speakers  | £19 |
| ScreenBeat Speakers      | £15 |

## VIDEO CARDS

### Hercules ISA

|                    |      |
|--------------------|------|
| Graphite Power 2Mb | £265 |
| Dynamite Pro 1Mb   | £143 |
| Dynamite Pro 2Mb   | £184 |

### Hercules VLB

|                            |      |
|----------------------------|------|
| Dynamite Pro 1Mb           | £143 |
| Dynamite Pro 2Mb           | £184 |
| Graphite Terminator 64 2Mb | £284 |
| Graphite Terminator 64 4Mb | £433 |
| Stingray 1Mb               | £104 |

### Hercules PCI

|                            |      |
|----------------------------|------|
| Stingray 1Mb               | £101 |
| Dynamite Power 2Mb         | £243 |
| Graphite Terminator 64 2Mb | £284 |
| Graphite Terminator 64 4Mb | £433 |

### ATI PCI

|                         |      |
|-------------------------|------|
| Graphics Expression 1Mb | £140 |
| Graphics Expression 2Mb | £185 |
| Graphics Win Turbo 2Mb  | £299 |
| Graphics Pro Turbo 2Mb  | £309 |
| Graphics Pro Turbo 4Mb  | £399 |

### ATI ISA

|                         |      |
|-------------------------|------|
| Graphics Ultra Plus 2Mb | £185 |
| Graphics Ultra Pro 2Mb  | £229 |

### ATI VLB

|                         |      |
|-------------------------|------|
| Graphics Expression 1Mb | £140 |
| Graphics Expression 2Mb | £185 |
| Graphics Win Turbo 2Mb  | £299 |
| Graphics Pro Turbo 2Mb  | £309 |
| Graphics Pro Turbo 4Mb  | £399 |

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## VIDEO CARDS

### Diamond VLB

**Diamond Stealth 64 1Mb DRAM Card**

**£98**



|                                 |      |
|---------------------------------|------|
| Stealth 64 1Mb DRAM Upgradeable | £98  |
| Stealth 64 2Mb DRAM             | £138 |
| Stealth 64 2Mb VRAM             | £234 |
| Stealth 64 4Mb VRAM             | £343 |
| Viper Pro 2Mb Upgradeable       | £254 |
| Viper Pro 4Mb                   | £349 |

### Diamond PCI

|                     |      |
|---------------------|------|
| Stealth 64 1Mb DRAM | £98  |
| Stealth 64 2Mb DRAM | £138 |
| Stealth 64 2Mb VRAM | £235 |
| Stealth 64 4Mb VRAM | £345 |

### Matrox MGA VLB

|                          |      |
|--------------------------|------|
| Impression Lite 2Mb VRAM | £195 |
| Ultima Plus 200 2Mb VRAM | £279 |
| Ultima Plus 200 4Mb VRAM | £429 |

### Matrox MGA PCI

|                              |      |
|------------------------------|------|
| Impression Lite 2Mb VRAM     | £195 |
| Impression Plus 175 2Mb VRAM | £259 |
| Impression Plus 175 4Mb VRAM | £424 |
| Impression Plus 220 2Mb VRAM | £309 |
| Impression Plus 220 4Mb VRAM | £474 |

### Matrox MGA ISA

|                          |      |
|--------------------------|------|
| Impression Plus 2Mb VRAM | £295 |
|--------------------------|------|

**matrox**

### Orchid ISA

|                     |      |
|---------------------|------|
| Fahrenheit Plus 1Mb | £93  |
| Fahrenheit VA 1Mb   | £109 |
| Kelvin 64 1Mb       | £99  |
| Kelvin 64 2Mb       | £133 |

### Orchid VLB

|                       |      |
|-----------------------|------|
| Kelvin 1Mb EZ         | £89  |
| Kelvin 64 1Mb         | £99  |
| Kelvin 64 2Mb         | £134 |
| Fahrenheit 2Mb 64     | £158 |
| Fahrenheit Pro 2Mb 64 | £244 |
| Fahrenheit Pro 4Mb 64 | £345 |

### Orchid PCI

|                       |      |
|-----------------------|------|
| Kelvin 1Mb EZ         | £89  |
| Kelvin 64 1Mb         | £99  |
| Kelvin 64 2Mb         | £135 |
| Fahrenheit 2Mb 64     | £159 |
| Fahrenheit Pro 2Mb 64 | £243 |
| Fahrenheit Pro 4Mb 64 | £347 |

### Video Logic

|                                 |      |
|---------------------------------|------|
| 928 Movie ISA or VLB            | £249 |
| 928 Movie ISA or VLB with sound | £354 |

### Taxan ATI

|                         |      |
|-------------------------|------|
| 2Mb GTS WinBoost VLB    | £145 |
| 2Mb GTS WinTurbo 64 VLB | £245 |
| 4Mb GTS WinTurbo 64 VLB | £395 |
| 2Mb GTS WinBoost 64 PCI | £145 |
| 2Mb GTS WinTurbo 64 PCI | £245 |
| 4Mb GTS WinTurbo 64 PCI | £395 |

## SOUND CARDS

### Sound Blaster

|                                       |      |
|---------------------------------------|------|
| Sound Blaster V2.0 Value              | £53  |
| Sound Blaster Pro Value               | £52  |
| Sound Blaster Pro 16 Value            | £64  |
| Sound Blaster Pro 16 Multi CD         | £90  |
| Sound Blaster Pro 16 SCSI 2           | £114 |
| SB. Pro 16 ADSP Multi CD              | £110 |
| SB. Pro 16 ASP SCSI 2                 | £134 |
| SB. Pro 16 AWE 32                     | £170 |
| Wave Blaster                          | £98  |
| Midi Blaster                          | £104 |
| Orchid SoundDrive 16EZ                | £62  |
| Orchid SoundDrive 16EZ + SCSI         | £79  |
| Orchid GameWave Plus                  | £99  |
| Orchid SoundWave 32 Pro               | £134 |
| Orchid SoundWave 32 Pro SCSI          | £148 |
| Orchid Wavebooster 2Mb + Cubase Lite  | £118 |
| Orchid Wavebooster 4Mb + Cubase Lite  | £155 |
| Orchid Wavebooster 4Mb + FX + MIDIson | £178 |
| Gravis Ultrasound                     | £98  |
| Gravis Ultrasound Max Card            | £142 |
| Gravis Ultrasound MidiKit             | £29  |

## MONITORS

### ViewSonic

|                   |        |
|-------------------|--------|
| 14" ViewSonic 6E  | £184   |
| 15" ViewSonic 15G | £249   |
| 17" ViewSonic 17G | £549   |
| 17" ViewSonic 17  | £684   |
| 20" ViewSonic 20  | £995   |
| 21" ViewSonic 21  | £1,345 |

### SONY

|               |        |
|---------------|--------|
| 15" CPDSFI    | £288   |
| 17" CPD-1730  | £595   |
| 17" GDM-17SE1 | £825   |
| 20" GDM-20SEV | £1,315 |
| 20" GDM-30SE1 | £1,478 |

### Philips

|                             |        |
|-----------------------------|--------|
| 14" Enhanced VGA Colour     | £168   |
| 14" AutoScan Colour         | £205   |
| 15" Brilliance AutoScan 15B | £254   |
| 15" Brilliance AutoScan 15A | £295   |
| 17" AutoScan Colour 17C     | £428   |
| 17" AutoScan Colour 17B     | £568   |
| 21" AutoScan Colour         | £1,439 |

### NEC

|                    |        |
|--------------------|--------|
| 2V FST 14"         | £229   |
| Multisync XV15 15" | £284   |
| Multisync XE15 15" | £393   |
| Multisync XV15 17" | £584   |
| Multisync XE15 17" | £714   |
| Multisync XP17 17" | £944   |
| Multisync XE21 21" | £1,385 |
| Multisync XP21 21" | £1,824 |

### Panasonic

|                    |        |
|--------------------|--------|
| 15" Panasync/Pro 3 | £355   |
| 17" Panasync 5G    | £612   |
| 17" Panasync/Pro 5 | £779   |
| 21" Panasync/Pro 7 | £1,395 |

### Taxan

|                       |        |
|-----------------------|--------|
| 14" Ergovision 400LR  | £185   |
| 14" Ergovision 410LR  | £195   |
| 15" Ergovision 580LR  | £285   |
| 17" Ergovision 880LR  | £519   |
| 17" Ergovision 895LR  | £835   |
| 20" Ergovision 1080   | £910   |
| 21" Ergovision 2100LR | £1,564 |

### Liyama (IDEK)

|                              |        |
|------------------------------|--------|
| 15" VisionMaster FST MF-8115 | £259   |
| 17" VisionMaster FST MF-8617 | £526   |
| 21" VisionMaster FST MF-8221 | £1,247 |
| 21" VisionMaster FST MF-9121 | £1,293 |
| 21" VisionMaster FST MF-8621 | £1,645 |

### CTX

|            |      |
|------------|------|
| 14"        | £176 |
| 15"        | £236 |
| 17" 1765GM | £449 |



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## IDE BACK-UP STORAGE

### Colorado Tape Drives

|                      |                  |
|----------------------|------------------|
| Jumbo Trakker 250Mb  | £189             |
| Jumbo Trakker 350Mb  | <b>NEW!</b> £218 |
| Jumbo Trakker 700Mb  | <b>NEW!</b> £309 |
| 250Mb Internal Jumbo | £95              |
| 350Mb Internal Jumbo | <b>NEW!</b> £116 |
| 700Mb Internal Jumbo | <b>NEW!</b> £199 |

### Colorado 700Mb External Jumbo Trakker

**£309**



|                             |      |
|-----------------------------|------|
| KE-10 External Kit XT/AT    | £70  |
| Systos & OS/2 Shell Only    | £50  |
| Systos & OS/2 Software      | £60  |
| FC-20 High Speed Controller | £60  |
| TC-15 Controller Card       | £115 |
| Unix & Xenix Software       | £69  |
| Windows Software            | £29  |
| 120/250 Formatted Tape      | £11  |

## Omega Storage Products

|                              |      |
|------------------------------|------|
| 250Mb Internal Tape Streamer | £94  |
| 250Mb Parallel Tape Streamer | £225 |
| 700Mb Internal Tape Streamer | £260 |
| 700Mb External Tape Streamer | £330 |
| 21Mb Floptical Drive Kit     | £260 |

## Conner

|                |      |
|----------------|------|
| TapeStore 420  | £120 |
| TapeStore 850  | £199 |
| TapeStore 4000 | £389 |

## MOTHERBOARDS / CPUS

### Cyrix 386DX to 486DX

|                      |      |
|----------------------|------|
| DX 20MHz - 486 40MHz | £139 |
| DX 25MHz - 486 50MHz | £159 |
| DX 33MHz - 486 66MHz | £210 |

### Cyrix 386SX to 486SX

|                      |      |
|----------------------|------|
| SX 20MHz - 486 40MHz | £139 |
| SX 25MHz - 486 50MHz | £159 |

## Intel Overdrive Chips

|                         |      |
|-------------------------|------|
| Overdrive 486SX2-50MHz  | £80  |
| Overdrive 486DX2-50MHz  | £99  |
| Overdrive 486DX2-66MHz  | £135 |
| Overdrive 486DX4-75MHz  | £225 |
| Overdrive 486DX4-100MHz | £249 |
| Pentium Overdrive       | £259 |

## CPUs

|                       |      |
|-----------------------|------|
| Intel 80486SX-25MHz   | £49  |
| Intel 80486SX-33MHz   | £62  |
| Intel 80486SX2-50MHz  | £58  |
| Intel 80486DX-33MHz   | £109 |
| Intel 80486DX2-50MHz  | £79  |
| Intel 80486DX-50MHz   | £196 |
| Intel 80486DX2-66MHz  | £119 |
| Intel 80486DX4-75MHz  | £138 |
| Intel 80486DX4-100MHz | £188 |
| AMD DX2-80MHz         | £118 |
| AMD DX4-100MHz        | £179 |

## VESA LocalBus with CPU

|                           |      |
|---------------------------|------|
| Intel 80486SX2-50MHz 256K | £123 |
| Intel 80486DX-33MHz 256K  | £174 |
| Intel 80486DX2-50MHz 256K | £145 |
| Intel 80486DX-50MHz 256K  | £259 |
| Intel 80486DX2-66MHz 256K | £185 |
| Intel DX4-75MHz 256K      | £204 |
| Intel DX4-100MHz 256K     | £253 |

## PCI with CPU

|                           |      |
|---------------------------|------|
| Intel 80486SX2-50MHz 256K | £154 |
| Intel 80486DX-33MHz 256K  | £204 |
| Intel 80486DX2-50MHz 256K | £174 |
| Intel 80486DX2-66MHz 256K | £214 |
| Intel Pentium 60MHz       | £549 |
| Intel Pentium 66MHz       | £589 |
| Intel Pentium 90MHz       | £629 |
| Intel Pentium 100MHz      | £989 |

## Motherboards without CPU

|                                    |     |
|------------------------------------|-----|
| 486VLB 3 VESA & 4 ISA 30-pin, 256K | £65 |
| 486VLB 3 VESA & 4 ISA 72-pin, 256K | £65 |
| 486PCI 3 PCI & 4 ISA 72-pin, 256K  | £89 |

## SCSI BACK-UP STORAGE

### Tanberg Data

|                     |      |
|---------------------|------|
| 250S 250Mb Internal | £320 |
| 525S 525Mb Internal | £420 |
| External Kit        | £80  |

## MODEMS

### US Robotics



|                                       |      |
|---------------------------------------|------|
| Sportster 14.4 + Fax External         | £130 |
| Sportster 14.4 + Fax Internal         | £135 |
| Sportster 28.8 V34 + Fax Ext. or Int. | £199 |
| Courier Dual Turbo + Fax              | £348 |
| Courier V. Fast                       | £398 |
| PCMCIA 2496 + Fax                     | £143 |
| PCMCIA 14.4 + Fax                     | £203 |

### Hayes



|                                   |      |
|-----------------------------------|------|
| Optima 24                         | £210 |
| Optima+Fax 96                     | £288 |
| Optima 288 V. Fast, V.32bis + Fax | £225 |
| Optima 288 FVC+Fax Value Pack     | £748 |
| Accura 288 V. Fast + Fax          | £225 |
| Accura 144 + Fax                  | £165 |

|                                      |      |
|--------------------------------------|------|
| Pace Microlin FX32 Plus Portable     | £168 |
| Pace Microlin FX32 Plus Internal     | £143 |
| Pace Microlin FX32 Plus NB32 PCMCIA  | £225 |
| Pace Microlin FX PC card             | £104 |
| Pace Microlin FXNB24 PCMCIA          | £148 |
| Pace Linnett 34 VFC V. Fast External | £324 |
| Pace Comet 34 VFC V. Fast Desktop    | £320 |

## RAM

Kingston RAM for Apple, Compaq, IBM etc. available at the lowest UK prices.

Call UK Flex now!



|                            |      |
|----------------------------|------|
| 1Mb x 9 SIMMs 70ns 9-chip  | £35  |
| 1Mb x 9 SIMMs 70ns 3-chip  | £27  |
| 1Mb x 36 SIMMs (4Mb) 70ns  | £110 |
| 1Mb x 32 SIMMs (4Mb) 70ns  | £99  |
| 2Mb x 36 SIMMs (8Mb) 70ns  | £220 |
| 4Mb x 36 SIMMs (16Mb) 70ns | £420 |

**RAM prices change daily!**  
Call UK Flex for the best deals!

## KEYBOARDS

|                                |     |
|--------------------------------|-----|
| Microsoft Natural Keyboard     | £65 |
| 102 UK Keyboard                | £17 |
| 102 Fujitsu Keyboard           | £28 |
| Cherry G80-3000 Keyboard Click | £38 |
| Cherry G81-3000 Keyboard Soft  | £36 |

## MULTIMEDIA CARDS

|                                 |      |
|---------------------------------|------|
| Orchid Vidiola                  | £249 |
| Orchid Vidiola Pro              | £438 |
| Orchid Vidiola Premium          | £569 |
| Orchid Kelvin MPEG              | £164 |
| VideoLogic Captivator           | £189 |
| VideoLogic Captivator Pro       | £189 |
| 928 Movie ISA 1Mb               | £189 |
| 928 Movie VLB                   | £258 |
| 928 Movie ISA Sound             | £258 |
| 928 Movie VLB Sound             | £328 |
| PCI Movie 2Mb                   | £424 |
| 928 Movie w/MPEG Player ISA 1Mb | £424 |
| 928 Movie w/MPEG Player VLB 1Mb | £278 |
| Diamond Videostar               | £278 |
| VideoBlaster RT300              | £238 |
| VideoBlaster FS200              | £238 |
| Video Spigot                    | £208 |
| Rombo Media Pro Hi-Res          | £188 |
| Rombo Media Pro Plus            | £45  |
| Rombo TV Buster Internal        | £65  |
| Rombo TV Buster External        | £299 |
| Rombo PC Tuner                  | £265 |
| Intel Smart Recorder Pro        | £185 |
| Hauptpage Win/TV Celebrity      | £381 |
| Hauptpage Win/TV Cinema         | £394 |
| Logitech Photoman Plus          |      |
| Canon Ion PC Camera             |      |

We've dropped our trousers! UK Flex prices really are the bottom line!



## PRINTERS

|                              |        |
|------------------------------|--------|
| <b>NEW!</b> HP Deskjet 5P    | £Call  |
| HP Deskjet 520               | £198   |
| HP Deskjet 540C              | £205   |
| HP Deskjet 560C              | £315   |
| HP Deskjet 1200C             | £699   |
| HP Deskjet 1200C PostScript  | £1,295 |
| HP Deskjet 320               | £168   |
| HP Deskjet 320 & sheetfeeder | £199   |
| HP Laserjet 4L               | £358   |
| HP Laserjet 4ML              | £736   |
| HP Laserjet 4Plus            | £939   |
| HP Laserjet 4MP              | £850   |
| HP Laserjet 4M Plus          | £1,265 |
| HP Laserjet 4si              | £2,095 |
| HP Laserjet 4si MX           | £2,995 |
| HP Laserjet 4V A3            | £1,399 |
| HP Laserjet 4V A3 PostScript | £1,980 |
| HP Colour Laserjet           | £4,279 |

## HP Support Pack

|                                    |      |
|------------------------------------|------|
| Diamond Edge Deskjet Mono Portable | £40  |
| Diamond Edge Deskjet Colour        | £65  |
| Diamond Edge 4L, 4ML, 1200C/PS     | £100 |
| Diamond Edge 4P, Scanjets          | £135 |
| Diamond Edge HP4, 4M               | £170 |

## MATROX MGA GRAPHICS ACCELERATORS

### The fastest card in the West

MGA Impression Plus is the powerful, one-board answer for Windows, multimedia & 3D graphics acceleration. It offers resolutions up to 1600 x 1200, the industry's highest refresh rate, full 24-bit colour support (at 1280 x 1024), and the most advanced set of productivity features for Windows and CAD. **£259**

### MGA Impression Lite

**£195**



- Includes 3 free 3D games - SENTO, Spectre MGA and HAWK
- Upgradeable to 4MB
- Supports 'open' standards in video expansion and 3D, to take advantage of improvements in hardware and software improvements

## The Award-Winning MGA Family

|                                  |      |
|----------------------------------|------|
| Matrox VLB                       |      |
| MGA Impression Lite 2Mb VRAM     | £195 |
| MGA Ultima Plus 200 2Mb VRAM     | £279 |
| MGA Ultima Plus 200 4Mb VRAM     | £429 |
| Matrox PCI                       |      |
| MGA Impression Lite 2Mb VRAM     | £195 |
| MGA Impression Plus 175 2Mb VRAM | £259 |
| MGA Impression Plus 175 4Mb VRAM | £424 |
| MGA Impression Plus 220 2Mb VRAM | £309 |
| MGA Impression Plus 220 4Mb VRAM | £474 |
| Matrox ISA                       |      |
| MGA Impression Plus 2Mb VRAM     | £295 |

## CD-ROM DRIVES

### AT Interface

|                                   |      |
|-----------------------------------|------|
| Panasonic CR562 Dual Speed        | £85  |
| Sony CDU55E Dual Speed            | £88  |
| Panasonic CR563 with 2 CDs        | £95  |
| Orchid CDS3110 Dual Speed + 2 CDs | £98  |
| Mitsumi CRMC-FX400 Quad Speed     | £135 |
| NEC 271 IDE Quad Speed            | £145 |
| Teac CD-55AK Quad Speed Internal  | £189 |
| Toshiba XM5302B Quad Speed        | £XXX |
| Orchid SoundWave 32 & CD-ROM      | £248 |
| Mitsumi Interface Card            | £11  |

## SCSI Interface

|                                   |        |
|-----------------------------------|--------|
| Pioneer DRU-104X Quad Speed Int   | £189   |
| Pioneer DRM-602X Dual Jukebox     | £399   |
| Pioneer DRM-604X Quad Jukebox     | £865   |
| Pioneer 1804X 4X 18-Dr. Jukebox   | £1,345 |
| Toshiba XM5201 Bare Triple Speed  | £142   |
| Toshiba XM3601B Bare Quad Speed   | £234   |
| Toshiba XM3601B Bare Kit Quad Spd | £325   |
| Toshiba XM3601B Bare 4X External  | £425   |
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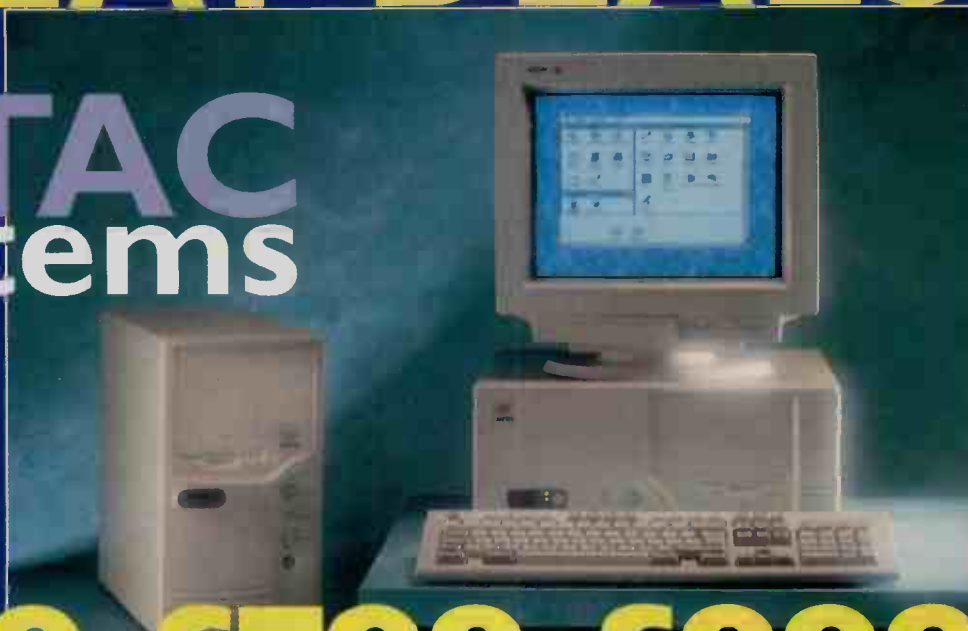
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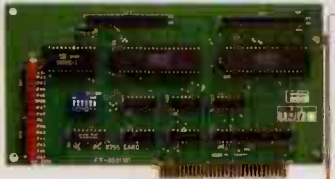
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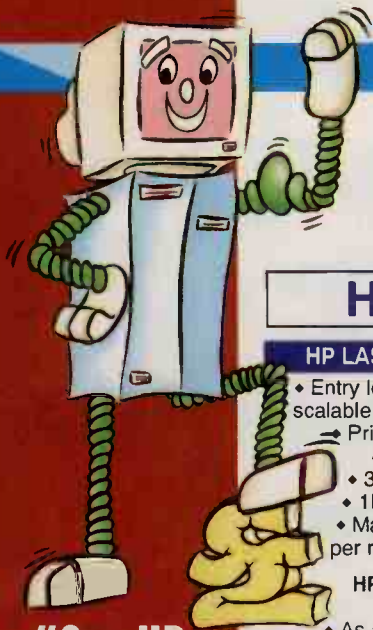
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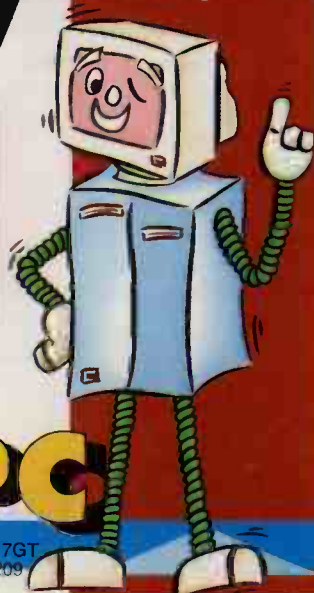
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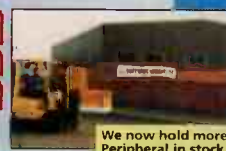
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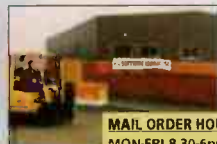






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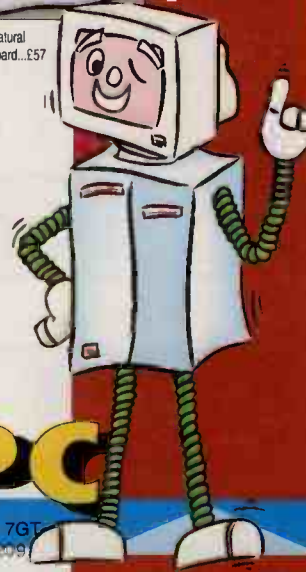
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- CD Audio cables
- 16-bit high performance soundcard
- Twin stereo speaker system
- PC Joystick
- Shareware CD
- EZ Language CD
- World Atlas CD

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EZ Language CD



Shareware CD



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- Double Speed or Quad Speed CD-ROM Drive
- CD Audio cables
- 16-bit high performance soundcard
- Twin stereo speaker system
- PC Joystick

- Microsoft Encarta 95 CD
- Microsoft Works CD
- Microsoft Golf CD
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- Microsoft Beethoven CD

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## What we do know is...



### PCMCIA - Your Questions Answered

#### What are PCMCIA Cards?

Also called PC Cards, they are the size of a credit card. PC Cards enhance your computers capabilities. All PC Cards conform to the PCMCIA standard making it possible in theory to swap from one machine to another. In practice, as with any other evolving standard, there are some compatibility issues.

#### What is Type I, II and III?

There are three types of PC Card with varying thicknesses, which determines its peripheral function.

**Type I Cards** - (3.5mm thick) are used for memory expansion (DRAM) to give your notebook extra memory to run programs. SRAM or Flash Cards give you additional data storage. These work in the same way as floppy disks.

**Type II Cards** - (5mm thick) are the most versatile. Generally used for products such as modems, network connections, sound cards and SCSI connections for CD ROM and Multimedia.

**Type III Cards** - (10mm thick) are the newest introduction to the PC Card technology. The extra thickness of this card allows it to have rotating parts, and are thus used for mini hard disks.

#### What are Card and Socket Services?

In the same way that attaching a network card or another peripheral to your PC requires software to operate the device, Card and Socket Services are the software drivers which control the PC Cards. There are three main vendors of this software: Phoenix, Systemsoft and Award. This software allows you to configure your card to suit your machine and system setup.

#### My PCMCIA Modem can be installed without Card and Socket services, I thought I always needed Card and Socket Services?

Some PC cards have software direct enablers which mean they do not need Card and Socket Services. This makes installation even easier and also saves on system memory.

#### Can I use my PC Card on my PC?

Simply add a PCMCIA slot to your PC with a card reader, either internally through an interface adaptor or externally through the parallel port. The slots act as additional drives, so you can copy and fax to your PC Card. To run Type II products through your PC you need an Internal PCMCIA reader.

#### How do I link my mobile system to a CD ROM using my PCMCIA slot?

Use a PCMCIA SCSI card link to a CD ROM drive or other SCSI devices such as scanners, cameras and multimedia products.

#### What is the difference between SRAM and Silicon disk?

SRAM cards are battery backed storage cards with a battery life of over 2 years. Silicon disks have no battery and operate like mini hard disks.

#### I have heard people mention 32 bit bus cards & Berlin. What's it all about?

The PCMCIA committee will soon issue the next release of specifications (Version 3, code-named BERLIN and now called the PC Card standard) and this will bring with it several new and exciting features. The most important of these are 32 bit card bus capabilities and dual function cards. Basically 32 bit will give faster throughput than the current cards which are 16 bit. As is implied, dual function cards will be able to perform more than one task.

I'm very confused about the whole issue of PCMCIA cards, Socket Services, enablers, SRAM, Flash. What happens if I need help? Simply ring and speak with our Technical support department, who will be able to give both Pre & Post sales advice and support. And don't forget we guarantee that all the PC Cards listed and sold by Pico Direct will work with the appropriate card slot.

### PCMCIA MEMORY

|                               |         |
|-------------------------------|---------|
| 128KB SRAM                    | £39.95  |
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### CARD READERS

Allows you to operate all of your PC cards - LANs, Fax/Modems, type III ATA hard drives and memory cards on your desktop. Internal and external as well as one, two or four slots available.

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This PCMCIA unit requires NO EXTERNAL POWER, making it the ideal choice for taking multimedia on the road.

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### IBM/PICO ETHERNET ADAPTOR CARDS

10Base-T and 10Base2 Ethernet. LAN cards for portable computing applications.

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- MS Windows for Work Group certified

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### IBM/PICO TOKEN-RING I/O CARD

Provides attachment to Token-Ring LANs operating at either 16Mbps or 4Mbps.

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- Operates with DOS 5.0, PC LAN Program (PCLP) v.1.34 and Novell Netware v.3.11.
- Driver support includes NDIS and ODI.
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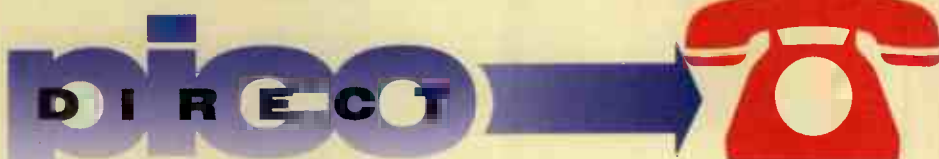
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## Wordstar for Windows

WordStar for Windows v2 (RRP £399) is one of the UK's leading easy to use wordprocessing packages for Windows. As well as being powerful, it is remarkably easy to learn. Superb spellchecker, thesaurus and DTP-like features are included as standard. Counts as two selections.

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Borland's acclaimed spreadsheet package has been acknowledged as the best Windows spreadsheet in the world. Counts as two selections.



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TurboCAD for Windows is one of the world's leading easy to use design, drafting & CAD package and is ideal for Technical Drawings, home & landscape design etc. RRP £100

## Lotus Ami Pro for Windows

Lotus Ami Pro for Windows v2 is a powerful wordprocessor for the Windows environment. It includes features such as graphics handling and drawing tools, Maths & Tables and an excellent Anglo-american dictionary

## Framework XE

Framework XE is a powerful integrated software package for DOS users and features no less than 7 great programs. Comprehensive wordprocessing with spellchecking and mailmerge; Powerful spreadsheet & much more



## Hannah Barbara Animation Workshop

This amazing new leisure/educational software suite featuring Fred Flintstone & other characters brings cartoon animation to your PC. Includes: Over 200 frames of sample animation. Clipart of your favourite characters. Drawing & painting package. Variable speed playback. User guide etc.



## Quicken

If you need help organising your finances, Quicken v2.0 for Windows is the answer. It looks and works just like your bank statement and cheque book.



## Lotus Organizer

Lotus Organizer v1.0 for Windows is a superb easy to use filing system and personal organiser with diary, address book, planner etc.



## Landscape for Windows

Landscape the easy way - without lifting a shovel! Create a beautiful outdoor environment, complete with foliage, furniture, pools and even a summer house from landscape object libraries.

## Mavis Beacon Typing Tutor

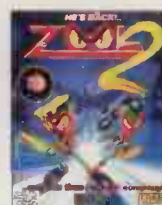
Critically acclaimed Mavis Beacon for Windows is the best way to learn to type, dramatically improving your typing skills with a precise personalised course created to meet your individual needs.

## XtraDrive Hard Disk Doubler

New IIT XtraDrive is the best hard disk doubling program available. Using XtraDrive is like installing an additional hard disk within your PC system.

## PagePlus 2 Lite for Windows

PagePlus Lite for Windows is an easy to use desktop publishing package for Windows that allows you to create impressive flyers, newsletters, invitations, business stationery, forms and more.



## Zool 2

The latest CD version of this platform game is better than ever. Zool 2 features the Ninja of the Nth dimension, a karate expert living on planet Loox, and his female partner Zool. Their mission is to defeat the evil Krool who wants to conquer the known universe.



## Expert Labels for Windows

Labels, envelopes & Bar Codes all in one simple package. Choose from over 120 standard labels or create your own in any size. Powerful Database & Address book. Includes Quick-save button to ensure no data is lost. 4 Barcode formats etc.

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## Pool for Windows

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## Chess for Windows

Allows you to choose from four different boards and chessman styles, and over ten different skill levels. Complete with VCR-styled buttons to replay or review recent moves or an entire game

## Fun Pack for Windows

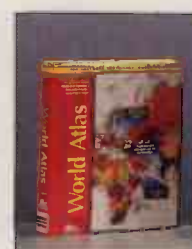
Fun Pack is a collection of seven arcade-style action games for Microsoft Windows. They are similar to classic video games like Pac Man, Asteroids, Breakout, Missile Command etc.

## Home Design for Windows

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## CA-Compete! for Windows

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Contains over 500 images in Colour and Black & White, allows you to add clip art to your newsletters, memos, business documents or personal letters



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Play & Learn has been developed for children between the ages of four to ten. Which consists of ten colourful animated games and a series of learning modules covering spelling & maths



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Help Wallobee Jack & his friends search for the mysterious Bingi Burra Stone in Australia. Sydney Airport & Ayers Rock are just some of the destinations your children will learn about as they try to ouwit the nasty Dagon & find the precious stone.



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## MultiWorks 30

This comprehensive DOS integrated software package includes word processor, database, spreadsheet, time manager, address book communications module, & much more. Needs DOS 3.1 or higher.



## Holiday Fonts for Windows

Includes 35 fonts and borders for Windows 3.1 for year-round holiday greetings. Make your own holiday cards, announcements and invitations.



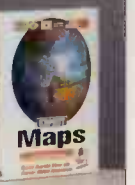
## Rooms for Windows

Xerox Rooms for Windows simplifies, enhances and accelerates the use of Windows by organising your files in a more logical and efficient manner. Rooms - The fastest way to work in Windows!



## Borland Screenery

This amazing program provides superb wallpaper and screen savers when using Microsoft Windows 3.1. Makes your Windows desktop bright and colourful.



## Maps for Windows

This complete electronic atlas gives you the opportunity to increase your geographical awareness from Pole to Pole - without leaving your desk! Contains over 200 up to date country & regional maps, & includes an extensive database.



## Fun School

Fun School for 7 to 11 year olds consists of six new and original programs to entertain and educate your children. Stimulating sound, cleverly animated rewards and stunning graphics combine with essential elements of the National Curriculum to delight your children while they learn.



## SuperStar Sports

Superstar Sports contains seven superb DOS games for one or more players. These include: SuperStar Hockey, Bowling, Darts, Outdoor Soccer, Ping Pong, Air Hockey and Indoor Soccer.



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Allows you to explore the night sky on your PC. Position yourself anywhere in the solar system and view any part of the night sky as it would appear from that location.



## SoundWav Pro for Windows

This great program brings digitized sound right into your computer without the aid of a soundcard. It can lighten your day with humorous and appropriate dialogue from popular movies and cartoons.



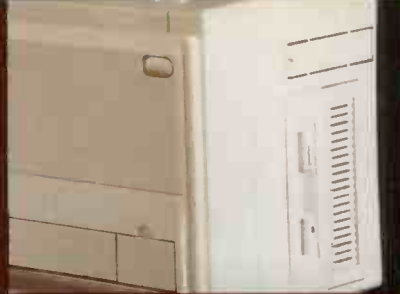
## Fontware Face Pack 2

Fontware Face pack includes 16 superb TrueType fonts for Windows 3.1. All the fonts are true Monotype, fully scalable and will work with all programs able to use Windows 3.1 fonts.





The Plasma, Dual Scan Colour and TFT Colour models come in a lightweight transportable 'lunchbox' type of case.



Three drive bays (two 5.25" and one 3.5") suitable for hard disk, both floppy drives (combined) and CD-ROM.



Inside the universal case for Plasma, Dual Scan and TFT models showing Power supply, fitted hard disk with 2 bays spare, Pentium 90 motherboard and PCI/ISA expansion slots.

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The new Colossus Power Portable range provides incredible computing power for users who need desktop performance in a portable package. They are designed for mobile and industrial applications that require speed, expandability, and ruggedness and the most popular uses are in network management, instrumentation, data capture, presentations and multimedia applications.

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The latest Pentium® 90 and 100Mhz processor chips, fast 32 bit PCI bus, intelligent hard disk controllers and superb 64-bit PCI SVGA graphics controllers provide the best performance from any system in the world, let alone a portable.

## The Highest Specification

Colossus Portables carry a very high specification with high capacity hard disks (upto 4Gb) and ample RAM (upto 128Mb). They are available with Gas Plasma, CRT Colour, Dual Scan Colour or TFT Colour screens.

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The Colossus portable case supports three storage drive bays (enough for both floppy drives, hard disk, and CD ROM or tape backup). All models are mains powered and full size ISA, VESA or PCI expansion slots are supported in addition to standard port.

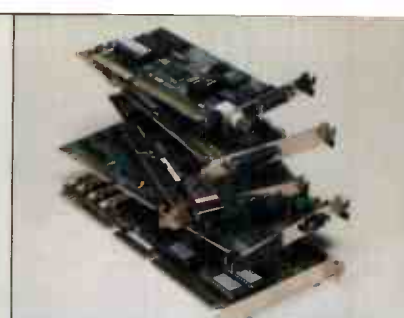




CRT Model with traditional 'sewing machine' type case showing two accessible 5.25" drive bays with one internal drive bay.



Inside the Colossus CRT case showing integral 9" SVGA colour tube, fitted hard & floppy drives with spare bay, PCI motherboard and expansion slots.



The unique advantage of the Colossus range is the ability to take standard PCI, ISA, VESA and EISA expansion cards.



### CRT Portable 486DX2-66

- Colossus portable case with 3 drive bays
- Intel 486DX2-66 processor
- 256K external cache
- 4Mb RAM expandable to 128Mb
- 540Mb IDE hard drive
- 3.5" 1.44Mb floppy drive
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- 9" CRT SVGA colour screen (CP models)
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Plasma VGA screen - No extra charge  
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TFT colour £1300  
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### Plasma Portable 486DX4-100

- Colossus portable case with 3 drive bays
- Intel 486DX4-100 processor
- 256K External cache
- 16Mb RAM expandable to 128Mb
- 1Gb IDE hard drive
- 3.5" 1.44Mb floppy drive
- SVGA graphics card
- Gas Plasma VGA screen (CRT colour, Dual Scan colour or TFT colour screen models available)
- Serial, parallel & mouse ports
- Keyboard & mouse
- MS DOS 6.22 & Windows 3.11 for WorkGroups

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Plasma VGA screen - No extra charge  
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TFT colour £1300



### TFT Colour Portable P90 PCI

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- Intel Pentium® 90 Mhz processor
- 256K External cache
- 16Mb RAM expandable to 128Mb
- 2Gb PCI SCSI hard drive
- 3.5" 1.44Mb floppy drive
- SVGA graphics card
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| 170MB      | £999   | £1049  |
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- 486 DX2/50 upgradable
- Internal 3.5" High Density Floppy Drive
- 170MB HDD
- 32-Bit VESA Local Bus for SVGA
- Windows™ Accelerator
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- Local Bus 64 Bit Graphics
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- 420Mb Hard Disk Drive
- Enhanced Local Bus Graphics
- SuperVGA Colour Monitor
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- Software Suite, Educational/Entertainment Pack and Home Communications

## Presario 772

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- Enhanced Local Bus Graphics
- SuperVGA Colour Monitor
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- PCI Local Bus
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## Presario 942

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- 8Mb RAM
- 420Mb Hard Disk Drive
- Enhanced Local Bus Graphics
- SuperVGA Colour Monitor
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- Software Suite, Educational/Entertainment Pack and Home Communications

## Presario 962

- 60MHz Pentium Processor
- 8Mb RAM
- 535Mb Hard Disk Drive
- Enhanced Local Bus Graphics
- SuperVGA Colour Monitor
- 5 ISA Slots/5 drive bays
- PCI Local Bus
- Software Suite, Educational/Entertainment Pack



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- MS Windows
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- 14" SuperVGA Colour Monitor
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- Stereo Speakers and Microphone
- 102 key Keyboard & Mouse

### SOFTWARE:

- MS DOS
- MS Windows
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- MS Golf
- MS Cinemania
- MS Entertainment Pack
- MS Works for Windows
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### SOFTWARE:

- MS DOS
- MS Windows
- MS Encarta
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- PCMCIA Rel. 2.0 Type II/III Slots
- 84 key Keyboard, 12 function keys with Mousepoint
- MS DOS 6.22, MS Windows 3.11
- 3.5 Hours Battery Life
- Weighs 3.1Kg
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T2100CT/350 £2249



### TOSHIBA T2450CT

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- PCMCIA Rel. 2.0 Type II/III Slots
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- MS Windows Sound System
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- Weighs 3.2Kg
- 3 Year Warranty

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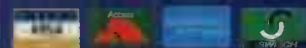
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| Courier Dual / Fax       | 310 |
| Courier Dual Turbo / Fax | 379 |
| PCMCIA 2496 / Fax        | 155 |
| PCMCIA 14.4 / Fax        | 229 |



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| Reveal 14.4 External           | 99  |
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| DFI 14.4 External              | 89  |
| PACE FXMB PCMCIA               | 179 |



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| 4/25 250MB   | 486SX/25MHZ | 4MB | STN MONO   | 899         |
| 4/33C 170MB  | 486SX/33MHZ | 4MB | STN COLOUR | 1020        |
| 4/33C 250MB  | 486SX/33MHZ | 4MB | STN COLOUR | 1189        |

### COMPAQ CONTURA NOTEBOOKS

|             |              |     |            |      |
|-------------|--------------|-----|------------|------|
| 400CX 250MB | 486DX2/40MHZ | 4MB | TFT COLOUR | 1695 |
| 410 250MB   | 486DX2/50MHZ | 4MB | STN MONO   | 1270 |
| 410C 350MB  | 486DX2/50MHZ | 4MB | DS COLOUR  | 1695 |
| 410CX 350MB | 486DX2/50MHZ | 4MB | TFT COLOUR | 2205 |

All models pre-installed with DOS 6, Win 3.1, Lotus Organiser, TabWorks, Compaq Welcome, Control Centre, Learning Centre, drivers & utilities and carry a 3 year Compaq care warranty. All prices exclude VAT. E. & O.E.

### COMPAQ LTE ELITE NOTEBOOKS

| MODEL/H.DISK  | PROCESSOR    | RAM | DISPLAY     | DISC. PRICE |
|---------------|--------------|-----|-------------|-------------|
| 4/50E 250MB   | 486DX2/50MHZ | 4MB | ACTIVE MONO | 1865        |
| 4/40C 170MB   | 486DX2/40MHZ | 4MB | DS COLOUR   | 1780        |
| 4/40CX 170MB  | 486DX2/40MHZ | 4MB | TFT COLOUR  | 2035        |
| 4/40CX 340MB  | 486DX2/40MHZ | 4MB | TFT COLOUR  | 2205        |
| 4/50CX 340MB  | 486DX2/50MHZ | 8MB | TFT COLOUR  | 2630        |
| 4/75C 340MB   | 486DX4/75MHZ | 8MB | DS COLOUR   | 2375        |
| 4/75C 510MB   | 486DX4/75MHZ | 8MB | DS COLOUR   | 2545        |
| 4/75CX 340MB  | 486DX4/75MHZ | 8MB | TFT COLOUR  | 2970        |
| 4/75CX 510MB  | 486DX4/75MHZ | 8MB | TFT COLOUR  | 3140        |
| 4/75CXL 510MB | 486DX4/75MHZ | 8MB | TFT COLOUR  | 3565        |
| 4/75CXL 510MB | 486DX4/75MHZ | 8MB | TFT COLOUR  | 3820        |

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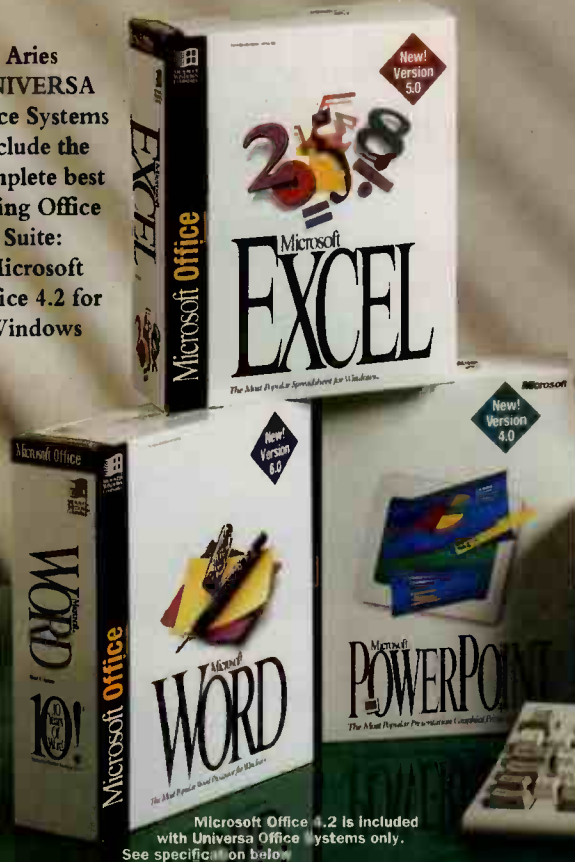


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- ◆ Multimedia Kit (see below)

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- ◆ Multimedia Kit (see below)

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- ◆ 4Mb RAM expandable to 64Mb
- ◆ 420Mb Hard Disk (12ms)
- ◆ 16 bit Super VGA Graphics Card
- ◆ Microsoft Office 4.2 for Windows\*
- ◆ Multimedia Kit (see below)

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- ◆ Pentium P60 60MHz Processor
- ◆ 8Mb RAM expandable to 64Mb
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| 16-bit ISA Bus Adapters      | Connection  | Single Card Pack Part No. | 5 Card Pack Part No. |
|------------------------------|-------------|---------------------------|----------------------|
| 3Com Etherlink III           | BNC/AUI     | CNA0610 £67               | CNA1900 £319         |
| 3Com Etherlink III           | UTP/AUI     | CNA0620 £67               | CNA1910 £319         |
| 3Com Etherlink III           | BNC/UTP/AUI | CNA0630 £75               | CNA1920 £355         |
| Aries NE2000 II              | BNC/UTP     | CNA0040 £32               | CNA1710 £145         |
| D-Link DE-220CT              | BNC/UTP     | CNA1570 £69               | CNA1730 £379 (6pk)   |
| Genius GE2000 II             | BNC/UTP     | CNA1130 £32               | CNA0940 £145         |
| Intel EtherExpress 16 Flash  | BNC/AUI     | CNA1460 £69               | CNA2020 £325         |
| Intel EtherExpress 16T Flash | UTP/AUI     | CNA1470 £69               | CNA2030 £325         |
| Intel EtherExpress 16C Flash | BNC/UTP/AUI | CNA1480 £79               | CNA2040 £389         |
| Novell NE2000 Plus           | BNC         | CNA1510 £48               | CNA2070 £235         |
| Novell NE2000T Plus          | UTP         | CNA1250 £48               | CNA2080 £235         |
| SMC Elite 16 Ultra           | BNC         | CNA0910 £59               | CNA1200 £339 (6pk)   |
| SMC Elite 16T Ultra          | UTP         | CNA0880 £59               | CNA0900 £339 (6pk)   |
| SMC Elite 16C Ultra          | BNC/UTP/AUI | CNA0890 £64               | CNA1210 £379 (6pk)   |
| SMC EliteEZ                  | BNC         | CNA2600 £66               | CNA2640 £309         |
| SMC EliteEZ                  | UTP         | CNA2610 £66               | CNA2650 £309         |
| SMC EliteEZ                  | BNC/UTP     | CNA2620 £73               | CNA2660 £339         |
| 32-bit EISA Bus Adapters     | Connection  | Single Card Pack          | 5 Card Pack          |
| 3Com Etherlink III           | BNC/AUI     | CNA0710 £140              | CNA1950 £699         |
| 3Com Etherlink III           | UTP/AUI     | CNA0720 £140              | CNA1960 £699         |
| Genius E1320                 | BNC/UTP     | CNA1370 £169              | CNA0960 £830         |
| Intel EtherExpress 32 Flash  | BNC/UTP/AUI | CNA1420 £189              | CNA1740 £829         |
| SMC Elite 32C Ultra          | BNC/UTP/AUI | CNA1780 £159              | CNA1930 £709         |
| MCA Bus (PS/2) Adapters      | Connection  | Single Card Pack          | 5 Card Pack          |
| 3Com Etherlink III           | BNC/AUI     | CNA0730 £146              | CNA1940 £709         |
| 3Com Etherlink III           | UTP/AUI     | CNA0740 £146              | CNA1940 £709         |
| D-Link DE-320                | BNC/UTP     | CNA1580 £99               | CNA0960 £779         |
| Genius E1162M                | BNC/UTP     | CNA1360 £159              |                      |
| SMC Elite/A                  | BNC         | CNA0350 £119              |                      |
| SMC Elite 10T/A              | UTP         | CNA0790 £119              |                      |
| VE5A Local Bus Adapters      | Connection  | Single Card Pack          | 5 Card Pack          |
| Aries CE3200-VL              | BNC/UTP/AUI | CNA1880 £99               | CNA2670 £475         |
| D-Link DE-500CT              | BNC/UTP     | CNA1750 £189              |                      |
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| SMC EtherPower               | BNC/UTP     | CNA1240 £129              | CNA2700 £579         |
| D-Link DE-530CT              | BNC/UTP     | CNA2710 £95               |                      |
| Parallel Port Adapters       | Connection  | Single Card Pack          | 5 Card Pack          |
| Genius E3000 II              | BNC/UTP     | CNA1145 £75               | CNA1230 £360         |
| D-Link DE-620CT              | BNC/UTP     | CNA1660 £129              |                      |
| SMC EliteNote                | BNC/UTP     | CNA1630 £159              |                      |
| PCMCIA Adapters              | Connection  | Single Card Pack          | 5 Card Pack          |
| 3Com Etherlink III           | BNC/UTP     | CNA1490 £145              |                      |
| D-Link DE-650CT              | BNC/UTP     | CNA2720 £135              |                      |
| Genius ME3000                | BNC/UTP     | CNA1620 £139              | CNA1770 £660         |
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All packs contain Ethernet card, 5m cables, software and connectors.

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| Length  | 1m | 3m | 5m | 10m | 15m | 20m | 30m | 50m | 100m | 300m |
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| LinkBuilder FMS II | 12  | opt | 1   | opt  | £399 |
| Aries              | UTP | BNC | AUI | SMNP |      |
| EH-8               | 8   | 1   | 1   | no   | £129 |
| EH-12              | 12  | 1   | 1   | no   | £249 |
| EH-16              | 16  | 1   | 1   | no   | £279 |
| EH-32              | 32  | 1   | 1   | no   | £459 |
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| GH1000             | 12  | 1   | 2   | opt  | £249 |
| SMC                | UTP | BNC | AUI | SMNP |      |
| Elite 3812TP       | 12  | opt | 2   | opt  | £399 |
| Tiger TP6          | 6   | -   | 1   | no   | £155 |
| Tiger TP12         | 12  | -   | 1   | no   | £299 |

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| ♦ Aries ER-4BA 4 port Repeater  | £339 |
| ♦ D-Link DE808 8 port Repeater  | £449 |
| ♦ D-Link DE1608 8 port Repeater | £679 |
| ♦ Genius E5020 2 port Repeater  | £299 |
| ♦ Genius E5021 4 port Repeater  | £499 |

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| ♦ Aries 10baseT UTP Transceiver | £42 |
| ♦ Aries 10base5 'N' Transceiver | £75 |

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| JetDirect Card - LaserJet III/IIID | £279 |
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| ♦ Round Cable Stripper                     | £12.00 |
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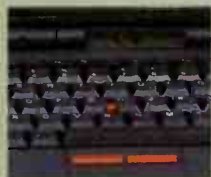
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**PC MAGAZINE, Cover Story: Notebooks, Aug 1994**

"...A great Windows PC, and an excellent value." "...the fact that you get the amount of performance we did from a battery charge speaks highly of the engineering."  
**LAPTOP BUYERS GUIDE & HANDBOOK, First Look, Dec 1994**

"Ranks above many famous-name notebooks. And in terms of pointing devices, it's definitely got them out-numbered."  
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**COMPUTER SHOPPER, PC Reviews, Nov 1994**

"Represents the best kind of innovation in the rapidly changing field of notebook computers. It keeps the best of proven technologies, such as a sharp display, and complements them with new technologies, such as those employed to stretch battery life. The long battery life makes it a good choice for anyone who needs a basic notebook that also delivers solid performance."  
**WINDOWS MAGAZINE, WinLab First Impressions, Dec 1994**  
Reviews done on Identical Notebook in the USA

Notebook shown here with 19mm Trackball with 2 buttons supplied as standard



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- ◆ Advance PMU Function
- ◆ Mono/Stereo 16 bit Sound System (Optional)
- ◆ Audio Line (In/Out) with volume control
- ◆ Built-in Speaker/Microphone (requires sound system)
- ◆ 1.44Mb 3.5" Floppy Drive
- ◆ 82 key QWERTY Keyboard
- ◆ 19mm Trackball (Optional Track-point device)
- ◆ PCMCIA slots (2 x Type II/1 x Type III)
- ◆ Hi-Speed 16C550 Serial Port
- ◆ Enhanced Parallel Port (EPP/ECP support)
- ◆ External Super VGA Monitor Port
- ◆ External Keyboard/PS/2 Mouse connector
- ◆ Optional Internal 14.4K Fax/Modem
- ◆ Rechargeable Ni-MH Battery Pack
- ◆ Weight: 3Kg
- ◆ Carrying Case

### LOW POWER 3.3V

All the components in the notebook run at 3.3V, giving up to three times longer life.

### SOUND PLUG-IN

Mono/Stereo sound system with built-in speaker/microphone by adding a soundcard.

### SUSPEND TO DISK

Suspend to memory or suspend to disk ensures data is never lost when you leave the notebook.

### EXTERNAL STATUS INDICATOR

"At a glance" multi colour indicator on the top cover shows if machine is charging, charged, suspended with battery charging or charged.

### INTERNAL STATUS INDICATOR PANEL

12 distinct icons will display, flash or change appearance to give you a complete report on the state of the machine including a 5 step graduated remaining charge gauge.

### ADVANCED POWER MANAGEMENT

Complete with a comprehensive set of 16 features that will allow you to customise the operation of the machine to your benefit.

### FLEXIBLE PCMCIA

Compartment for two type I/II or one type III PCMCIA slot with removable cover.

### UP TO 32Mb RAM

If your applications demand it, then we can supply it.

### REPLACEABLE HARD DISK DRIVE

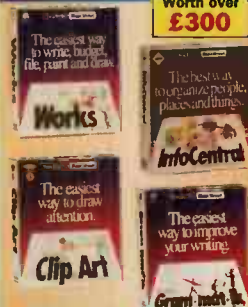
Running out of space? Replace the Hard Disk Drive easily. The system BIOS will automatically detect the new HDD

### SUPERB PERFORMANCE

CPU Upgrade up to Intel DX4-100 and 512KB of level 2 Cache! External connectivity enhanced by use of 16C550 Serial Port and Parallel Port with support for EPP/ECP

### FREE Software with every Perfecta Notebook

Worth over **£300**



**WORDPERFECT MAIN STREET RANGE**  
◆ WORKS ◆ INFOCENTRAL  
◆ CLIPART for HOME ◆ GRAMMATIK



Software actually supplied will be cosmetically different to that shown.

### 1 YEAR SUPPORT

All Perfecta Notebooks are covered by a FREE 12 Months Warranty in mainland UK.

### 2 YEAR GOLD CARE

For 12% of the cost, we will collect, repair and return your notebook within mainland UK for the first 24 months.

VAT: UK customers, please add 17.5% to value of order and carriage.

| Display            | 10" Mono<br>64 Grey Scale | 10" Colour<br>Dual Scan | 10" Colour<br>TFT Active Matrix |
|--------------------|---------------------------|-------------------------|---------------------------------|
| <b>7000 Series</b> | <b>7100</b>               | <b>7300</b>             | <b>7400</b>                     |
| SL i486SX™-33      | <b>£1099</b>              | <b>£1468</b>            | <b>£2179</b>                    |
| SL i486DX2™-50     | <b>£1198</b>              | <b>£1598</b>            | <b>£2249</b>                    |
| SL i486DX4™-75     | <b>£1269</b>              | <b>£1669</b>            | <b>£2329</b>                    |
| SL i486DX4™-100    | <b>£1329</b>              | <b>£1729</b>            | <b>£2389</b>                    |

All prices above are for standard 340Mb Hard Disk. Supplied with FREE Carrying Case  
**BUSINESS LEASING Low Cost Leasing - Call for details**

### ADDITIONAL OPTIONS

- 4 to 8Mb RAM Upgrade\* £159
- 4 to 16Mb RAM Upgrade\* £679
- 4 to 32Mb RAM Upgrade\* £205
- Track-point device £25
- 8 bit Internal Sound Card £39
- 16 bit Internal Sound Card £69
- Aries HiFi Speakers £29
- Internal V32bis 14.4K Fax/Modem (Non Approved) £139
- with Software £69
- Spare NiMH Battery Pack £49
- Spare AC Mains Adaptor £135
- PCMCIA Fax/Modem £145
- PCMCIA V32bis Fax/Mod. £149
- PCMCIA Ethernet Card £29
- Car Lighter Adaptor

- Docking Station £339
- External Keyboard £25
- \*Requires module exchange

### 7000 Notebook Upgrades

- (Prices valid when purchasing Notebooks only)
- UGA0530/A £25
- 340Mb to 540Mb HDD £125
- UGA0540/A £25
- 340Mb to 730Mb HDD £249

### HOTLINE SUPPORT

All Perfecta Notebooks are covered by Unlimited Lifetime Support. We want you to get the best from your machine, so we offer a comprehensive support package over the phone.



**Watford Electronics Ltd**

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# Aries Award-Winning Scanners



The Relisys Scanner has been voted the 'BEST SCANNER OF THE YEAR' by the readers of PC Direct



"better all round, and therefore a Best Buy, is Watford's Relisys...which combines value for money and good software support with quality output"



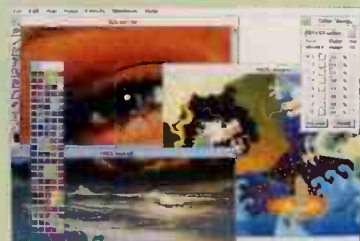
"...It is a considerable feat to produce a unit of this quality but Watford have stolen a march on everyone in so doing. Add the bundled software and it is undoubtedly the best buy." PC Today



Winner of the Best Peripheral Award

## FREE Software Worth over £500

The Relisys comes bundled with three FREE packages (requires Windows 3.1)



- Micrografx Picture Publisher v4 LE- Graphics Image Scanning/Editing
- Caere Omnipage Direct or Calera Wordscan\* OCR (optical character recognition)

\* Depending on availability

### Software Options for Aries Relisys Scanners

Special upgrade pricing valid at the time of purchase

|          |  |      |
|----------|--|------|
| UGA 1800 | Upg Picture Publisher LE to v4                     | £75  |
| UGA 1810 | Upg OmniPage Direct v2 to Omnipage Professional v5 | £185 |
| UGA 1820 | Upg PageKeeper Portfolio to PageKeeper Personal    | £85  |
| UGA 1830 | Upg PageKeeper Portfolio to PageKeeper Network     | £279 |

## STOP £35 OFF Advertised Prices of PRESS RELI Scanners (2412/4816/9624)

With the Aries Relisys you'll open up a whole new world of possibilities. Imagine being able to scan pictures, diagrams, photographs in perfectly matched colour. To use unlimited zoom to create precisely the size you need. And then to combine them with other files to produce truly professional documents.

Aries Relisys Scanners are the perfect answer for Desk Top Publishing (DTP) and Optical Character Recognition (OCR) applications in both the PC and MAC environments. With Firmware Interpolated, they

have outstanding Scanning Resolution in addition to stunning colours (16.7 million) and mono (256 greyscales) definition. Now industry standard TWAIN compliant, Aries Relisys Scanners can be used directly with Windows software.

With the new Hi-speed scanners you can scan an A4 image in colour in just minutes. And in a breathtaking 15 seconds deliver an A4 mono. It's simplicity itself to set up and use, and the new comprehensive range offers a model for every need.

## Aries Relisys Scanners

VM3420 SCSI II 256 Grey Scale

**£339**

VM3520 SCSI II 16.7 million Colours 24 bit

**£379**

- ◆ Up to 1200dpi resolution
- ◆ TWAIN standard
- ◆ Opt. Document Feeder
- ◆ Bundled Software
- ◆ Optional Transparency Adapter (Mono only)

### Auto Document Feeders

#### Specification

- ◆ Capacity: 50 pages
- ◆ Paper size - Max: 8.5"x14" - Min: 5.0" x 7.2"
- ◆ Paper Thickness .05 to .15mm sheet

ADF-30 **£259**

ADF-40 **£295**

ADF-60 **£345**

### Hi-Speed SCSI II Colour Flatbed Scanners

| Aries                        | RELI 2412 2400dpi       | RELI 4816 4800dpi       | RELI 9624 9600dpi         |
|------------------------------|-------------------------|-------------------------|---------------------------|
| Flat Bed Scanner type        | Colour                  | Colour                  | Colour                    |
| Scanning Process             | Single Pass             | Single Pass             | Single Pass               |
| Image Data Colour - 24 bit   | 16.7 million Colours    | 16.7 million Colours    | 16.7 million Colours      |
| Image Data mono - 8 bit      | 256 Greyscale           | 256 Greyscale           | 256 Greyscale             |
| Effective Scanning Area      | 216 x 356mm             | 216 x 356mm             | 216 x 356mm               |
| Zoom Out Feature             | Unlimited               | Unlimited               | Unlimited                 |
| Scanning Resolution - Max*   | 2400 x 2400             | 4800 x 4800             | 9600 x 9600               |
| Brightness/Contrast Settings | 256/256                 | 256/256                 | 256/256                   |
| Interface                    | SCSI II                 | SCSI II                 | SCSI II                   |
| Auto Document Option         | ADF-30                  | ADF-40                  | ADF-60                    |
| Transparency Adaptor         | VMT-68S optional £295   | VMT-68S optional £295   | Included - Worth £500     |
| Price                        | <b>£575 PC/£595 Mac</b> | <b>£785 PC/£795 Mac</b> | <b>£1425 PC/£1495 Mac</b> |

\* Resolution quoted is the maximum achievable using interpolation



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# Aries Monitors



## 15" Aries Monitors

### Aries EnergyPro 6000i NEW

Latest design auto-scanning colour display with micro processor controls giving you precise adjustments over all the major display functions. Offers exceptional value.

- ◆ 15" Flat screen colour display
- ◆ 0.28 dot pitch, non-glare tube
- ◆ EPA Energy Star compliant
- ◆ 1280 x 1024 @ 60Hz (NI)
- ◆ Front panel controls
- ◆ Microprocessor Control
- ◆ Horiz. frequency: 29KHz-70KHz
- ◆ Digital Control with LCD providing 13 preset and 4 user modes
- ◆ Adjustable Horizontal and Vertical sizes

**£239**



"The Aries is an excellent low-cost monitor that is easy to use and has all the features that you could wish for. We definitely wouldn't have any qualms about using it all day long as a Windows monitor."



The New range of Aries Monitors have been designed to easily meet the rigorous standards for energy conservation laid down in the US by the Environmental Protection Agency's Energy Star Program. With Aries EnergyPro Monitors saving energy doesn't mean compromising on features or quality. But best of all you will not have to pay any premium - The new Models are better value than ever.

## 17" Aries Monitors

### Aries EnergyPro 7560i NEW

At 0.26 dot pitch the 7560i is the finest quality display in its class and an unbeatable price. Featuring latest design auto-scanning colour display and precise adjustments over all display functions.

- ◆ 17" Flat screen colour display
- ◆ 0.26 dot pitch, non-glare tube
- ◆ EPA Energy Star compliant
- ◆ 1280 x 1024 @ 70Hz (NI)
- ◆ Horizontal frequency: 29KHz-80KHz
- ◆ Precise colour adjustment
- ◆ 20 preset and 4 user modes
- ◆ Front digital controls
- ◆ Pincushion and Trapezoid adjust
- ◆ MPRII Low Radiation

**£449**



"In terms of price and features this monitor offers excellent value for money."

## Clearly a better Image

For the ultimate in high-definition, flicker-free monitors displaying the sharpest text and graphics look no further than the new Aries Monitor range.



## 14" Aries Monitors

### Aries EnergyPro SVGA LR

- ◆ 14" high resolution colour display
- ◆ 0.28 dot pitch, non-glare tube
- ◆ EPA Energy Star compliant
- ◆ Low radiation Swedish MPRII Standard
- ◆ 800 x 600 (Non-Interlaced)
- ◆ 1024 x 768 (Maximum Resolution)
- ◆ Horizontal frequency: 29KHz-38KHz
- ◆ Controls: Horiz Width/Phase, Vert size/centre, tilt, Pincushion, Focus & Screen
- ◆ Includes Swivel base

**£165**

### Aries AlphaScan Pro LR

- ◆ 14" high resolution colour display
- ◆ 0.28 dot pitch, P22 non-glare tube
- ◆ 1024 x 768 @ 72Hz (non-interlaced)
- ◆ Horizontal frequency: 29KHz-70KHz
- ◆ Low radiation Swedish MPRII Standard
- ◆ Front mounted user controls
- ◆ Controls: Horiz Width/Phase, Vert size/centre, tilt, Pincushion, Focus & Screen
- ◆ Includes Swivel base

**£199**

# Panasync/Pro

## Digital Multi-Scan Colour CRT Displays

The PanaSync/Pro™ is the result of Panasonic's thorough approach to achieving a user-friendly design offering extra comfort and convenience. Electromagnetic radiation is minimal. And all the digital controls are built into the front panel for easy access. The finishing touch is an attractive pale beige cabinet.

### Low Electromagnetic Radiation

Panasonic has tackled the problem of radiation from VDTs head-on together with the electrostatic-free screen and other innovations. The result is an electromagnetic radiation level low enough to satisfy such strict standards as MPR II.

### AGRASCOAT™

For easy-to-view images that don't tire the eyes, the screen features unique AGRASCOAT (Anti-Glare, Anti-Reflection, and Anti-Static Coat). The AGRASCOAT is an original Panasonic coating technology that employs AR and silica coating methods to provide the advantages of both.

### Flicker-Free

A PanaSync/Pro™ provides a vertical scanning rate up to 90Hz for stable, flicker-free images, meeting ISO 9241.

### Front Design Puts Images First

Non-essential controls have been eliminated to assure a simple design that does not distract the viewer from the images on the screen.



TX-D2032

TX-D1731



## PanaSync/Pro 7

TX-D2131

Top-End Model with a 21" FS Screen. Delivering 1,600 x 1,280 High Resolution

- ◆ High 1,600 x 1,280 resolution
- ◆ 0.25mm fine dot pitch
- ◆ DQ-DAF gun and Advanced Invar Mask
- ◆ AGRASCOAT™
- ◆ 13 factory and 8 user presets
- ◆ 3 mode full front panel digital controls

**£1359**

## PanaSync/Pro 6a

TX-D2032

Easy-to-use Multi-Scan Display with Large 20" Screen

- ◆ High 1,280 x 1,024 resolution
- ◆ 0.28mm fine dot pitch
- ◆ DQ-DAF gun and Advanced Invar Mask
- ◆ AGRASCOAT™
- ◆ 13 factory and 8 user presets
- ◆ 3 mode full front panel digital controls

**£1125**

## PanaSync/Pro 5

TX-D1731

Compact 17" High Resolution Display with Flat and Square Screen

- ◆ High 1,280 x 1,024 resolution
- ◆ 0.27mm fine dot pitch
- ◆ DQ-DAF gun and Advanced Invar Mask
- ◆ AGRASCOAT™
- ◆ 13 factory and 8 user presets
- ◆ 3 mode full front panel digital controls

**£479**



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**NEW  
from  
GENIUS**

# Handy Scanners from the UK's No.1 Genius Supplier

Up to true 800dpi resolution and supplied complete with OCR software, a powerful presentation graphics package and an advanced image scanning, enhancement and editing application.

## ScanMate 32 & 256

**800 dpi**

- ◆ **Powerful Image software** - PhotoFinish 3.0 software has image auto enhancement functions and 87 tools to satisfy your creativity.
- ◆ **Hi resolution** - up to 800 dpi gives you the best image quality available.
- ◆ **Powerful OCR** - included SmartPage Direct means you'll never have to re-key data again.
- ◆ **TWAIN Compliant** - Lets you use the scanner with all TWAIN compatible programs
- ◆ **Includes:** Interface card, PhotoFinish 3.0, Media Mate presentation software, Smart Page Direct OCR software, TWAIN compliant software, User's manuals.

ScanMate/32 **£49**  
Black and White scanner with 32 Halftones  
ScanMate/256 **£65**  
256 true grey scale & B/W scanner

## NEW MOUSE 3+ £20

Designed for maximum comfort with a raised centre that fits the hollow of your palm. Includes powerful imaging software: PC Paintbrush for Windows, Media Mate Presentation Software, MouseMate Driver and Pad.

Mouse 3 with Driver only **£12**

## ScanMate Colour

"As perfect as a hand scanner will ever be"  
COMPUTER SHOPPER NOV 94

COMPUTER SHOPPER  
BEST BUY  
NOVEMBER 94

**£155**

**800 dpi**

**24 bit  
Colour**

- ◆ **Brilliant colour** - add the power of brilliant 24 bit true colour images to your DTP and presentation packages
- ◆ **Powerful Image software** - PhotoFinish 3.0 software has image auto-enhancement functions and 87 tools to satisfy your creativity.
- ◆ **High resolution** - up to 800 dpi gives you the best image quality available
- ◆ **Powerful OCR** - included SmartPage Direct means you'll never have to re-key data again.
- ◆ **TWAIN compliant** - Lets you use the scanner with all the TWAIN compatible products
- ◆ **Includes;** Interface card, Photofinish 3.0, Media Mate presentation software, SmartPage Direct OCR software, TWAIN compliant software, User's manuals

## Smarter Input - Smarter Output

### Multi Media Products

HiVideo frame grabber **£169**  
HiVideo Pro 24-bit colour digitised video **£229**  
HiTuner TV Tuner add in card **£58**  
(requires video card)  
HiEncoder Record Computer graphics to VCR or TV **£115**  
Game Pad greater hand held control **£9**

### New Sketch

New Sketch 1212 **£119**  
New Sketch 1812 **£185**  
New Sketch 1812D **£209**

### HiMouse The Advanced Mouse

HiMouse - Serial **£19**  
HiMouse - Serial & PS/2 **£21**  
HiMouse - Cordless **£20**

### Mouse 3

Mouse 3 (Driver only) **AMAZING VALUE £12**  
Mouse 3+ inc. PC Paintbrush for Win, Media Maze, Mousemate Driver and Pad **£20**

### HiTrak

Stationary Trackball Serial & PS/2 **£22**

### HiMouse Lite

High performance Optical Mouse **£35**

### HiPoint

The Smart Mini-Trakerball **£28**

### Genius Windows Hand Scanners

Powerful scanning for professional image processing  
GS-4500 - 32 Grey scales **£29**  
GS-B105W - 256 grey scales **£85**

## EASY PAINTER £69

Amazing value graphics tablet gives you the chance to exercise your creativity. Includes PC Paintbrush for Windows that provides dozens of natural paint tools, complete Utilities Disk, Stylus Pen and keyboard power adaptor.



# NEW SOFTWARE SOLUTIONS FROM LOTUS

## Lotus SmartSuite 3.0

*The only complete solution for Windows desktops.*

- ◆ Lotus 1-2-3 Release 5
- ◆ Lotus Freelance Graphics Release 2.1
- ◆ Lotus Ami Pro Release 3.1
- ◆ Lotus Approach Release 3.0
- ◆ Lotus Organizer Release 1.1

By bringing these five desktop tools together you can get your job done fast. With the SmartCenter, you can easily launch and switch between applications and this customisable icon palette also provides you with SuiteAnswers, the cross-application help service. Lotus SmartSuite 3.0 is workgroup enabled and the best suite to use with Lotus Notes.

|                         |        |
|-------------------------|--------|
| Standard Product        | '289   |
| Single License          | '285   |
| 20 License pack         | '4,725 |
| Upgrade                 | '169   |
| Trade-Up                | '199   |
| Single upgrade license  | '185   |
| 20 upgrade license pack | '3,800 |
| CD                      | '325   |
| Upgrade for CD          | '175   |

**Upgrade to Lotus 1-2-3 r5  
plus Lotus Approach r3  
for only £109**

What do you get when you couple the world's most popular spreadsheet with the world's easiest to use database?

Everything you need to, track, manage, analyse and report your business information.

- ◆ **SmartMaster spreadsheet templates and sample database applications** to get you started quickly.
- ◆ **Direct access to the most popular database file formats**
- ◆ **Powerful database access and query tools**
- ◆ **Create powerful map charts of geographically orientated data**
- ◆ **Easy to design and use data entry**
- ◆ **Dynamic crosstab analysis on your 1-2-3 customer lists with no rekeying**

NOW AVAILABLE ON CD

Lotus Approach  
Lotus 1-2-3  
Lotus Organizer

Lotus  
**SMARTSUITE**  
The only complete solution for Windows desktops

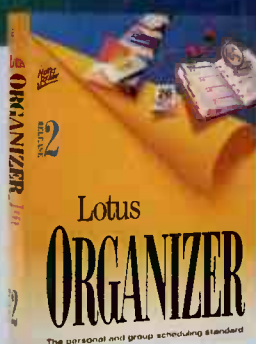
NEW VERSION

## Lotus Organizer 2.0

*Organizer 2 is a major upgrade of the industry's most popular networked personal information manager.*

Organizer 2 features enhancements to its award-winning user interface and more than 100 new features to set a new standard for personal productivity as a PIM and enhanced in workgroups. In addition, Organizer 2 now provides group scheduling and shared calendaring for users of Lotus Notes and cc:Mail.

|                  |        |
|------------------|--------|
| Standard Product | '79    |
| Single License   | '79    |
| 20 License pack  | '1,580 |
| Upgrade          | '45    |



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# PRICE BREAKTHROUGH

## HIGHSPEED

**InterNET  
READY\***

# Aries Fax-Modems

Enter the realm of high speed communications with Aries's new XLink range of fax-modems. Available in both internal PC card and external pocket versions, the XLink range will open up a whole host of national and international possibilities. Error correction and data compression are standard on all models. Fax your friends in Florida, transmit TIFFs to Turkey, enter the Internet and discover the growing world of comms with an Aries XLink Fax-Modem.

**14,400 BPS**

V.32  
bis

**£89**

External Modem XL-144E

**OS/2 WARP BUNDLE OFFER**

OS/2 Warp **CD Version** **£119**  
+ XL-144E **Floppy 3.5"** **£129**

**STOP PRESS**  
Optional Bundle with New  
**OS/2 WARP-**  
32-bit operating system

**28,800 BPS**

V.34  
CLASS

**£185**

External Modem XL-V34-288E

**OS/2 WARP BUNDLE OFFER**

OS/2 Warp + **CD Version** **£215**  
XL-V34-288E **Floppy 3.5"** **£225**



**BRITISH APPROVALS  
BOARD FOR  
TELECOMMUNICATIONS**

APPROVED  
for connection to  
telecommunication  
systems specified in  
the instructions for  
use subject to the  
conditions set out  
in them

**3 YEAR  
WARRANTY**

**FREE**

**Introductory  
Subscription to  
CompuServe**

**ARIES XLink RANGE**

Choose from 4 models - V32bis & V.34

All models feature:

- ◆ 28,800 (V.34) or 14,400 (V.32bis) bps top data transmission speed
- ◆ V32, V32bis, V23, V22, V22bis & V21
- ◆ Error Correction to MNP2-5 and V42 standards
- ◆ Data compression to MNP5 and V42bis standards
- ◆ Call back security
- ◆ Sync & Async Operation
- ◆ Group 3, Class I & II Fax at up to 14400bps (V.17)
- ◆ Group 1 and 2 fax compatible (V.27ter and V.29)
- ◆ 16550 UART Buffer (Internal models only)
- ◆ Fully Hayes compatible
- ◆ 3 years warranty
- ◆ BABT Approved plus additional Six European Approvals
- ◆ Supplied complete with Delrina Winfax Lite, DOS Fax Lite plus COMit Lite for DOS and Windows



**14,400 BPS**

**£87**

Internal Modem  
XL-144i

**BUNDLE  
OFFER**

OS/2 Warp +  
XL-144i  
**CD Version** **£117**  
**Floppy 3.5"** **£127**

**28,800 BPS**

**£179**

Internal Modem  
XL-V34-288i

**BUNDLE  
OFFER**

OS/2 Warp +  
XL-V34-288i  
**CD Version** **£209**  
**Floppy 3.5"** **£219**

\*VIA CompuServe



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# Catch a Great Offer on a Microsoft Mouse

## HOME MOUSE - NOW With 18 Games

- ◆ Delivers optimum comfort and usability for all home PC users (Kids, Mum and Dad) based on it's unique design.
- ◆ Same quality and reliability as the Mouse 2.0
- ◆ Includes the new Intellipoint Software - Home Edition to allow users to customise the way they want to work, with increased productivity and fun

- **SAVE TIME**
- **INCREASE EFFICIENCY**
- **HAVE FUN**

### FEATURES

- ◆ Change your pointer into a ship, seal or many other alternatives
- ◆ Short cut assignments of buttons
- ◆ Double speed click Acceleration
- ◆ Sonar Trails

**Microsoft® Home Mouse**  
plus  
**Microsoft® The Best of the  
Entertainment Pack**  
plus  
**Microsoft® Arcade**  
**FOR ONE GREAT PRICE**  
**£27**



Software will be cosmetically different from that shown

## Mouse 2.0 Intellipoint Version

- ◆ Still the No 1 selling mouse in the UK
- ◆ One mouse suits all (PS/2 or Serial, Left or right handed)
- ◆ THE ergonomic mouse - it increases comfort and efficiency when using Windows
- ◆ Now with New improved Intellipoint Software, to allow the users to customise the mouse to the way they want to work, with increased productivity and fun!

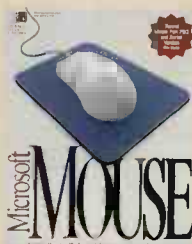
**£35**

"Frankly, there is only one mouse and it's the Microsoft® Mouse 2.0. If you haven't got it you need it"

What Personal Computer Mag

### FEATURES

- ◆ On screen toolbar allows easy access to the Improved software
- ◆ Autoscroll - allows scrolling of page when moving pointer to edge of screen
- ◆ Allow up to 6x magnification
- ◆ Short cut assignment of buttons
- ◆ Single click option
- ◆ Speed variation
- ◆ Smart speed - allows pointer to slow down over icons and responsive areas
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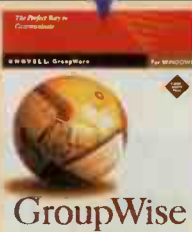
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GroupWise

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InfoCentral 1.1



InfoCentral

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MLP = Microsoft Licence Pack  
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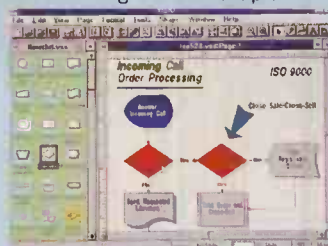
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| Visio Upgrade to v3.0               | <b><u>£58</u></b>  |
| Visio v3.0 WIN (Shapeware)          | <b><u>£89</u></b>  |
| Z-Soft PC Paintbrush DOS 5 Plus     | <b><u>£78</u></b>  |
| Z-Soft PC Paintbrush SE             | <b><u>£27</u></b>  |
| Z-Soft PC Paintbrush WIN 5 Plus     | <b><u>£41</u></b>  |
| Z-Soft Photofinish WIN v3           | <b><u>£89</u></b>  |
| Z-Soft Publishers Paintbrush WIN v2 | <b><u>£299</u></b> |
| Z-Soft Publishers Type Foundry WIN  | <b><u>£279</u></b> |

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| Borland Visual Tools v1.1                  | \$48  |
| MS Delta Version Control System WIN v1.0   | \$185 |
| MS Fortran P3 Station 32 for NT v1.0       | \$318 |
| MS Fortran P3 Station DOS v1.0             | \$181 |
| MS Fortran P3 Station WIN v1.1             | \$181 |
| MS Fortran v5.1 IMSL Libraries 2.0         | \$295 |
| MS Fortran WIN/DOS v5.1                    | \$110 |
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| MS Visual Basic DOS v3.0 Std Ed Dual Media | \$178 |
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| MS Visual Basic WIN v3.0 Std Ed            | \$177 |
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| MS Visual C++ WIN v2.0 CD                  | \$245 |
| MS Visual Control Pack WIN v1.0            | \$169 |
| MS Visual Tools Suite WIN v1.5             | \$695 |
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| Borland C++ v4.0 DOS / WIN                   | \$209 |
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| Borland Turbo C++ WIN v3.1 Visual Ed.        | \$62  |
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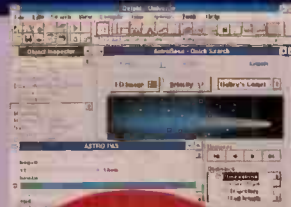
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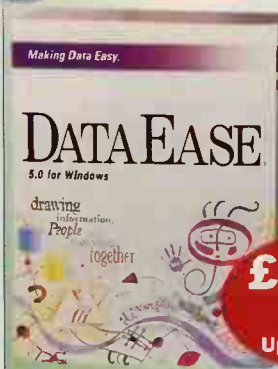


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| Lotus NotesSuite R3.2 20-LLP          | POA    |
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| Lotus NotesSuite R3.2 Upgrade 20-LLP  | POA    |
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| MS DOS v6.22 Upgrade 20-MMLP          | £621   |
| MS DOS v6.22 Upgrade 100-MMLP         | £2,899 |
| MS DOS v6.22 Upgrade 3.5"             | £38    |
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| MS WFWG v3.11 1-MLP                   | £80    |
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| MS Windows NT Stand Alone (3.5" & CD) | £218   |
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| MS Windows v3.11 20-MMLP              | £1,100 |
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| IBM OS/2 Warp WIN 3.0                        | £52  |
| IBM Person to Person for OS/2                | £139 |
| IBM Works for OS/2                           | £71  |
| S&S Dr. Solomons AV Toolkit OS/2 Monthly     | £255 |
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| CA Supercalc v5.5 DOS                     | £57    |
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| Lotus 1-2-3 WIN R5.0                      | £230   |
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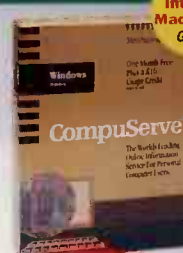
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| MS Word for WIN v6.0 CCP Upgrade        | £85    |
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| Wordstar v7 Upgrade                     | £89    |
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| WP WordPerfect WIN v6.1 Upg             | £73    |
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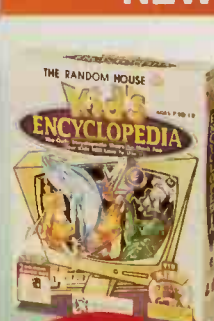
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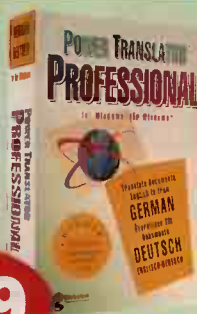


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From the programmers of Generic CADD® comes the first affordable, professional-level CADD program to combine ease of use, efficiency and user programmability into a single, unlimited package

Finally there's a powerful 2D design and drafting program that offers both experienced users and beginners the features they expect from a professional Windows CAD program - with the speed and high performance to produce your designs quickly and accurately. New-Visual CADD for Windows gives you direct support for AutoCAD DWG files, Generic GCD files plus OLE 2.0 support and using Visual BASIC you can tailor the program and develop your own add-ons. There's associative dimensioning, an inbuilt word processor with TrueType support, a customisable toolbar, plus a whole host of other features designed to make CAD really work for you.

Upgrade to  
**Visual CADD**  
for just  
**£199**  
R.R.P £495

### LIMITED SPECIAL OFFER

**Upgrade to Visual CADD for just £199**  
Trade in from Generic CADD or other CADD drawing programs\*  
Simply tell us which CAD or Drawing program you own when you return your registration card

# OS/2 Warp

## Making your computer easier, faster and fun.

Now your computer can be even easier to use, even more powerful. IBM's new award winning OS/2 Warp Version 3 gives you a miniature office desktop on your PC, customised the way you want it - with folders to file documents away safely, a launch pad for frequently used applications, and a style of working based on dragging and dropping icons.

OS/2 Warp Version 3 makes more efficient use of your computer's memory. So you could, for instance, work on a spreadsheet, print another document and receive a fax into your computer - all at the same time. And even if, for some reason, one application were to fail, Crash Protection would keep the others running.

But to really make your computer 'fly', enter the world of 32-bit computing and choose from the range of over 2,000 OS/2 applications. They include advanced word processors, spreadsheets, graphics programs... and games. OS/2 gives you fast access to the information highway, and vertical applications designed specifically for your business.

**OS/2 Warp v3  
CD £44**

**OS/2 Warp V3 3.5"  
£52**

- ◆ Intuitive and easy-to-use, with fast access to important applications
- ◆ Tuned to run faster, in as little as 4Mb of memory
- ◆ Runs DOS, Windows, and OS/2 applications simultaneously
- ◆ Crash Protection keeps the system running even if one program stops working

## FREE BONUS PACK

The OS/2 BonusPak, included at no extra charge with OS/2 Warp Version 3, puts a wealth of powerful productivity applications at your fingertips right from day one!

- ◆ Comes with OS/2 Warp Version 3 at no extra charge
- ◆ Suite of 32-bit OS/2 applications using the computer's full power
- ◆ Wordprocessor, spreadsheet, and calendar applications
- ◆ Information highway access applications including Internet, CompuServe and BBS's.



All Software supplied on 3.5" disks unless otherwise specified. For Windows Software we would recommend a minimum hardware requirement of a 386SX PC compatible with 4Mb RAM. Please check with the software publisher for suitability and system requirements before ordering. Software is not sold on trial basis. Special and bonus offer products may differ cosmetically from the standard product.



**Watford Electronics Ltd**

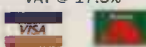
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**SALES HOTLINE**

**01582 745555**

All Prices exclude Carriage & VAT @ 17.5%



**Credit Card/Sales Order Line: 01582 745555 • Technical Support: 01582 745500 • Switchboard: 01582 487777**



# With Every WIN/TV Celebrity Card Comes a Big Thank you from IBM



**A Typical Windows Screen**

## WHAT'S SLUGGISH IN WINDOWS IS RACEY UNDER OS/2

Our on-board PAL tuner brings high quality broadcast - cable TV to your SVGA monitor which means you can watch your favourite TV programme, track the stock market and share prices via Teletext - whilst you're writing a letter in your favourite Windows word processing package. What Windows users won't be used to are the benefits of OS/2's multi-tasking technology. You'll be able (via Win/TV) to watch the News, see Teletext updating and even play your DOS games. Each in it's own separate window. And all bang up to speed. No time delays and no lagging behind

## A BONUS PACK INCLUDING THE INTERNET SOFTWARE COMPLIMENTS OF IBM

In addition to OS/2 WARP, IBM are also sending you their Bonus pack which contains the IBM Internet software which will allow you to EMail from Jersey to Japan, London to Las Vegas. In fact almost anywhere to anywhere.

## LINK SHARE PRICES TO YOUR PC

Win/TV supports DDE linking. For example, if you have a spreadsheet where UK prices are dependant upon the \$ exchange rate - if the exchange rate changes once a minute, so will your sterling prices

## A BRILLIANT DEAL FOR JUST £280

Never before have we been able to offer so much for so little. Let's face it, you're getting all the television channels, Teletext, a video frame grabber and a brand new operating system for less than the price of most software packages. And if you miss it now, you'll only have yourself to blame.

**Hauppauge!**

## A ONCE IN A LIFETIME OFFER OS/2 WARP AT NO EXTRA COST

What better commendation than to be the only manufacturer selected by IBM for this amazing special offer. Buy the Win/TV Celebrity card to watch TV, TELETEXT & VIDEO in any Windows application and you'll receive the highly acclaimed OS/2 Warp - 32 bit operating system just by completing and returning the registration card to IBM completely free of charge.



**A Typical OS/2 Screen**

Win/TV is a 16 bit multimedia frame grabber which allows the user to watch and capture full motion TV/VIDEO and TELETEXT under resizable windows.

### Features

- ◆ An on-board 122 Channel Tuner offers one board solution
- ◆ 128 page Teletext with SAVE, COPY, PASTE and DDE facilities
- ◆ 1280x1024 non-interlaced resolution. No feature connection required
- ◆ Full screen video playback.
- ◆ Connects to VCR & Camcorder for 24 bit frame grabbing
- ◆ Compatible with Teletext 2000 Service on Channel 4
- ◆ Preview facility. Allowing all channels to be viewed simultaneously.



**only  
£265**



**Watford Electronics Ltd**

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**SALES HOTLINE  
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All Prices exclude Carriage & VAT @ 17.5%



Credit Card/Sales Order Line: 01582 745555 • Technical Support: 01582 745500 • Switchboard: 01582 487777



# AMAZING MULTIMEDIA OFFERS

Choose one of these special offer CD-ROM drives which comes complete with the Solution Kit

|  |      |
|--|------|
| Aries ATAPI IDE Dual Speed Solution Kit  | £208 |
| Panasonic Dual Speed CR-562 Solution Kit | £224 |
| NEC Quad Speed 4X-IDE Solution Kit       | £279 |
| TEAC Quad Speed CD-55A Solution Kit      | £339 |

## Microsoft Solution Kit includes:

- ◆ 16 bit Stereo Sound Card
- ◆ Soundblaster Pro, MPC & MPC 2 Compatible
- ◆ Sound/Recording Software
- ◆ Aries Stereo Speakers (Opt. Upgrade to Aries HiFi Pro Speakers Only £18 + VAT)
- ◆ Complete Solution Bundle Software Pack
- ◆ MS Encarta 95 Encyclopaedia
- ◆ MS MultiMedia Works
- ◆ MS Dangerous Creatures
- ◆ MS Money
- ◆ MS Golf
- ◆ MS Scenes (3.5" disks)

## Plus Legend Pack CD Bundle

- ◆ Robocop 3D
- ◆ F29
- ◆ Mega Race
- ◆ Pushover
- ◆ Epic
- ◆ Might and Magic II
- ◆ D/Generation
- ◆ Contraption Zack
- ◆ ChessMaster 2100
- ◆ Life & Death II - The Brain
- ◆ Kids can Read - Cinderella
- ◆ Mud Puddle
- ◆ Thomas Snowsuit
- ◆ Paper Bag Princess
- ◆ Spiders - National Geographic



## CD-ROM DRIVE OFFERS

### Aries ATAPI IDE Dual Speed CD-ROM

**Lowest Cost ATAPI IDE Drive**



- ◆ ATAPI IDE Drive
- ◆ Supports Kodak Multisession Photo CD, Audio CD-DA, CD-XA, CD-I & High Sierra (White Book Compatible)
- ◆ High Speed with 300Kb/sec Data Transfer Rate
- ◆ MPC Level 2 Compliant with 250ms Seek Time
- ◆ Supports Audio Scan, Skip Back and Random Play
- ◆ Video CD Compliant/MPEG 1 Full Motion Video Playback
- ◆ Supplied with Audio Lead

- ◆ CD-ROM with Audio Lead £79
- ◆ CD-ROM Kit 2 with Aries 16 bit Stereo Soundcard (as below) £129

#### Aries 16 bit Stereo Sound Card

- ◆ 16 bit Stereo SoundCard, compatible with SoundBlaster Pro, CD-ROM interface support, 44.1KHz play/record, 4-operator FM synthesizer
- ◆ Adlib, Sound Blaster & Pro, MS Win System Compatible
- ◆ True 16 bit Sound Sampling
- ◆ Built-in Midi Interface and Joystick Port
- ◆ Bundled Utility Software

### Watford - Panasonic CR-562 Offer

- ◆ MPC Compliant
- ◆ Multisession
- ◆ Kodak Photo CD Compatible
- ◆ Access Time: 320ms
- ◆ Transfer Rate: 300Kb/s

**DUAL SPEED**

|   |      |
|---|------|
| WEpn Kit 1: CR562 with Audio/Data Leads               | £87  |
| WEpn Kit 2: CR562 with I'Face & Leads                 | £97  |
| WEpn Kit 3: CR562 with Aries 16 bit Stereo Sound Card | £136 |

### Watford - Mitsumi FX400M Offer

- ◆ ATAPI IDE Drive
- ◆ MPC Compliant
- ◆ Multisession
- ◆ Kodak Photo CD Compatible
- ◆ Access Time: 250ms
- ◆ Transfer Rate: 450Kb/s

**QUAD SPEED**

|  |      |
|--|------|
| WEMt Kit 1: FX400M IDE Drive                           | £129 |
| WEMt Kit 3: FX400M with Aries 16 bit Stereo Sound Card | £179 |

### Watford - Teac CD-55A Offer

- ◆ MPC Compliant
- ◆ Multisession Quad Speed
- ◆ Kodak Photo CD Compatible
- ◆ Access Time: 195ms
- ◆ Transfer Rate: 600Kb/s
- ◆ 256K Data Buffer

**QUAD SPEED**

|  |      |
|--|------|
| WETc Kit 2: CD-55A with I'Face & Leads                 | £169 |
| WETc Kit 3: CD-55A with Aries 16 bit Stereo Sound Card | £219 |

### Watford - Creative CR-563 Offer

- ◆ MPC Compliant
- ◆ Multisession
- ◆ Kodak Photo CD Compatible
- ◆ Access Time: 320ms
- ◆ Transfer Rate: 300Kb/s

**DUAL SPEED**

|   |      |
|---|------|
| WECr Kit 1: CR563 with Audio/Data Leads                 | £92  |
| WECr Kit 2: CR563 with Sound Blaster 16 Value Kit       | £159 |
| WECr Kit 3: CR563 with 16 bit Sound Blaster 16 MCD ADSP | £199 |

**FREE SOFTWARE**  
Aldus Photostyle SE CD  
New Grolier's Encyclopedia

## Aries Quality Speakers

- ◆ Ideal for PC Multimedia System
- ◆ Magnetically Shielded



Aries Digital Plus Speakers (Inc. stand)

|                                 |     |
|---------------------------------|-----|
| Aries Stereo Speakers           | £6  |
| Aries Hi-Fi Speakers 10W        | £19 |
| Aries Hi-Fi Pro Speakers 25W    | £28 |
| Aries Digital Speakers 25W      | £39 |
| Aries Digital Plus Speakers 80W | £48 |

HiFi and Digital series speakers have built-in Power Amplifier, Base, Treble and Volume controls.

|                         |       |
|-------------------------|-------|
| Aries Screen Microphone | £4.50 |
| Aries Headphone Set     | £4.50 |

## Optional Software Bundle Packs

- Media Wonder Pack £24
- ◆ Farm Animals (Nat Geo)
- ◆ Butterflies (Nat Geo)
- ◆ Kids Can Read
- ◆ World Atlas
- ◆ US Atlas
- ◆ Mavis Beacon Typing
- ◆ Chess Master 3000 & 2100
- ◆ Beyond The Black Hole
- ◆ Life & Death
- ◆ Disan Lau
- ◆ The Puzzle Gallery
- ◆ Loopz
- ◆ Cribbage King
- ◆ Checkers
- ◆ Backgammon
- ◆ Robot Tank
- Educational Pack £25
- ◆ Maths Numbers
- ◆ Maths Algebra
- ◆ French
- ◆ Junior
- ◆ English
- ◆ 10/10-National Curriculum Software

## CREATIVE MULTIMEDIA KITS



### CREATIVE BUNDLE KIT OFFERS

#### CREATIVE BUNDLE 1

- ◆ Creative CR-563 Dual Speed CD-ROM Drive
- ◆ Creative SoundBlaster 16 Value Sound Card
- ◆ Aries Stereo Speakers (Upg. to HiFi Pro Speakers for only £18 + VAT)
- ◆ Bundle CD Software collection -Worth over £300
- MS Encarta 1995
- MS MultiMedia Works
- MS Dangerous Creatures
- MS Money, MS Golf
- MS Scenes (3.5")

**£198**

#### CREATIVE BUNDLE 2

As Above Plus: ◆ Legend CD Software

**£228**

### Plus Legend Pack CD Bundle

- ◆ Robocop 3D
- ◆ F29
- ◆ Mega Race
- ◆ Pushover
- ◆ Epic
- ◆ Might and Magic II
- ◆ D/Generation
- ◆ Contraption Zack
- ◆ ChessMaster 2100
- ◆ Life & Death II - The Brain
- ◆ Kids can Read - Cinderella
- ◆ Mud Puddle
- ◆ Thomas Snowsuit
- ◆ Paper Bag Princess
- ◆ Spiders - National Geographic

## MULTIMEDIA OFFICE

- ◆ CR563 Dual Speed CD ROM Drive
- ◆ Microsoft Office Professional v4.3
- ◆ Sound Blaster 16 ADSP
- ◆ Stereo Headphones and Microphone
- ◆ Microsoft Encarta CD
- ◆ Microsoft Sound System Software
- ◆ Creative Text & Voice Assist and Wavestudio

**£379**

## GAMEBLASTER CD16

- ◆ CR563 Dual Speed CD ROM Drive
- ◆ Sound Blaster 16 Card
- ◆ Stereo Speakers & a Joystick
- ◆ Rebel Assault, Sim City, Iron Hellix, Lemmings, Indianapolis, Conspiracy & Syndicate

**DUAL SPEED**

**£222**

## DISCOVERY KIT

- ◆ CR563 Dual Speed CD ROM Drive
- ◆ Sound Blaster 16 Card
- ◆ Stereo Speakers & Microphone
- ◆ Aldus Photostyle SE CD, Grolier's Encyclopedia, 3D Dinosaurs Adventure, Conspiracy & Magic Castle, Kid Pix & Syndicate

**DUAL SPEED**

**£222**

## NEC MULTISPIN CD SOLUTION KITS

### NEC MULTISPIN RANGE:

|                       |      |
|-----------------------|------|
| 3Xp Plus Solution Kit | £399 |
| 4Xi Plus Solution Kit | £439 |

### Solution Kit includes:

- ◆ Creative SoundBlaster 16 SCSI Card
- ◆ Aries Stereo Speakers (Opt. Upgrade to Aries HiFi Pro Speakers £18 + VAT)
- ◆ Microsoft Software Pack (See Above)
- ◆ Audio Lead

All Prices exclude Carriage & VAT @ 17.5%



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# Printers & Accessories

## Laser Printers

|                                |       |       |
|--------------------------------|-------|-------|
| • Brother HL630                | 6ppm  | £326  |
| • Brother HL660                | 6ppm  | £468  |
| • Brother HL 1260*             | 12ppm | £910  |
| • Canon LBP 4i*                | 4ppm  | £395  |
| • Canon LBP-8 IV*              | 8ppm  | £905  |
| • Canon LBP-8 IIR*             | 8ppm  | £1559 |
| • Epson EPL-3000*              | 4ppm  | £389  |
| • Epson EPL-5200*              | 6ppm  | £462  |
| • Epson EPL-5600*              | 6ppm  | £594  |
| • Fujitsu VM600                | 6ppm  | £499  |
| • HP LaserJet 4L               | 4ppm  | £354  |
| • HP LaserJet 4 ML             | 4ppm  | £734  |
| • HP LaserJet 4MV              | 16ppm | £1975 |
| • HP LaserJet 4V               | 16ppm | £1370 |
| • HP LaserJet 4+               | 12ppm | £935  |
| • HP LaserJet 4M+              | 12ppm | £1258 |
| • HP LaserJet 4Si              | 16ppm | £2085 |
| • HP LaserJet 4Si MX           | 16ppm | £2967 |
| • HP LaserJet 5P               | 6ppm  | £POA  |
| • HP LaserJet Colour           |       | £4199 |
| • NEC SuperScript 610+*        | 6ppm  | £289  |
| • NEC SuperScript 660*         | 6ppm  | £416  |
| • NEC SuperScript 660i*        | 6ppm  | £565  |
| • NEC SuperScript Colour 3000* | 6ppm  | £649  |
| • OKI OL-400ex                 | 4ppm  | £279  |
| • OKI OL-410ex                 | 4ppm  | £385  |
| • OKI OL-810ex                 | 8ppm  | £545  |
| • OKI OL-850 PS                | 8ppm  | £1199 |
| • Panasonic KX-P4400           | 4ppm  | £270  |
| • Panasonic KX-P4401           | 4ppm  | £330  |
| • Panasonic KX-P4410**         | 5ppm  | £318  |
| • Panasonic KX-P4430**         | 5ppm  | £479  |
| • Panasonic KX-P4440**         | 10ppm | £679  |
| • Panasonic KX-P5400           | 4ppm  | £540  |
| • Star WinType 4000*           | 4ppm  | £288  |

\* 1 years on-site warranty  
\*\* 2 years on-site warranty

## Laser RAM Upgrades

| Type                | 1M   | 2M   | 4M   | 8M   |
|---------------------|------|------|------|------|
| • Canon LBP-4+      | £139 | -    | -    | -    |
| • Canon LBP-4i      | £109 | -    | £279 | -    |
| • Canon LBP-8 IV    | £119 | -    | £299 | -    |
| • EPL-4100/4300     | £70  | £110 | £205 | -    |
| • EPL-5200/5800     | £58  | £115 | £215 | -    |
| • Fujitsu VM600/VM4 | £57  | £85  | £149 | £299 |
| • Fujitsu VM800     | £115 | -    | -    | -    |
| • HP III/III/IIID   | £75  | £115 | £135 | -    |
| • HP II/II          | £75  | £115 | £135 | -    |
| • HP IIISI          | £57  | £85  | £158 | £299 |
| • HP 4/4M/4P/4MP    | £85  | £85  | £149 | £299 |
| • HP 4L/4ML         | £75  | -    | -    | -    |
| • KX-P4410/4430     | £129 | £199 | -    | -    |
| • KX-P4420/4450     | £75  | £115 | £135 | -    |
| • KX-P4400/5400     | £89  | £139 | £229 | -    |
| • OKI OL400e        | £99  | £118 | -    | -    |
| • Star LP-8         | £138 | £225 | -    | -    |
| • Star LS-5         | £75  | -    | -    | -    |

## Laser Consumables

| Type                    | Toner  | Drum | Dev  |
|-------------------------|--------|------|------|
| • Brother HL630         | £20    | £99  | -    |
| • Canon/Star 4s         | £46    | -    | -    |
| • Canon LBP-8 IV        | £70    | -    | -    |
| • Canon LBP-8 IIR       | £52    | -    | -    |
| • EPL-4100/4300         | £64    | £89  | -    |
| • EPL-5200              | £85    | -    | -    |
| • EPL-7100/7500/8100    | £117   | -    | -    |
| • Fujitsu VM600         | £85    | -    | -    |
| • Fujitsu VM800         | £115   | -    | -    |
| • Fujitsu VM4           | £29    | £149 | £89  |
| • HP II/III/IIID        | £47    | -    | -    |
| • HP III/III/IIIP       | £46    | -    | -    |
| • HP IIIISI/4Si/MX      | £77    | -    | -    |
| • HP 4/4M               | £67    | -    | -    |
| • HP 4L/4ML/4P/4MP      | £44    | -    | -    |
| • HP 4V/MV              | £115   | -    | -    |
| • NEC 610               | £79    | -    | -    |
| • NEC S60/60P/62P/90/95 | £105   | -    | -    |
| • OKI OL-400/800        | £19    | £189 | -    |
| • OKI OL-400e           | £17    | £129 | -    |
| • KX-P4410/30           | £28    | £80  | £90  |
| • KX-P4440              | £32    | £108 | £115 |
| • KX-P4420              | £24    | £57  | £55  |
| • KX-P4450/501/51/55    | £18    | £75  | £60  |
| • KX-P4400/5400         | £11.50 | £69  | -    |
| • Qume Crystalprint     | £99    | £189 | -    |
| • Star LS-5             | £83    | -    | -    |

## Laser Accessories

|   |          |
|---|----------|
| • JetPage Postscript Cartridge - IIP/IIIP | £169     |
| • Postscript Upgrade for LaserJet 4       | £270     |
| • LaserJet 4 Lower Paper Cassette         | £205     |
| • LaserJet 4 JetDirect Ethernet Card      | £339     |
| • LaserJet IIIP Lower Paper Cassette      | £115     |
| • Ozone filter for KX-P4420               | £9       |
| • Ozone filter for KX-P4450/4455          | £20      |
| • LaserJet 4Si Duplex Unit                | £475     |
| • Envelope Feeder for LaserJet 4          | £199     |
| • LaserJet Font Cartridges                | from £45 |
| • LaserJet III FX/IBM Emulation Cart.     | £79      |
| • Lower Paper Tray for Canon LBP-4        | £98      |
| • A5 Paper Feeder for LaserJet 4P         | £85      |
| • Postscript Upgrade for LaserJet 4P      | £225     |

## 9pin Matrix Printers

|                           |        |       |
|---------------------------|--------|-------|
| • Citizen Swift 90        | 80col  | £114  |
| • Citizen Swift 90 Colour | 80col  | £121  |
| • Citizen 1200+ Parallel  | 80col  | £90   |
| • Citizen 120D+ Serial    | 80col  | £105  |
| • Epson LX100             | 80col  | £108  |
| • Epson LX300             | 80col  | £88   |
| • Epson LX400             | 80col  | £89   |
| • Epson LX1050            | 132col | £172  |
| • Epson FX870             | 80col  | £221  |
| • Epson FX1170            | 132col | £280  |
| • Epson DFX5000+          | 132col | £1099 |
| • Panasonic KX-P1150      | 80col  | £89   |
| • Panasonic KX-P3696      | 80col  | £259  |
| • Star LC15               | 132col | £177  |
| • Star LC100C             | 80col  | £89   |
| • Star LC90               | 80col  | £89   |
| • Star ZA200              | 80col  | £255  |
| • Star ZA250              | 132col | £315  |

## 24pin Matrix Printers

|                             |        |      |
|-----------------------------|--------|------|
| • Citizen ABC Mono          | 80col  | £103 |
| • Citizen ABC Colour        | 80col  | £125 |
| • Citizen Swift 200 Mono    | 80col  | £138 |
| • Citizen Swift 200 Colour  | 80col  | £146 |
| • Citizen Swift 240 Mono    | 80col  | £160 |
| • Citizen Swift 240 Colour  | 80col  | £178 |
| • Citizen Swift 24X         | 132col | £187 |
| • Epson LQ100               | 80col  | £97  |
| • Epson LQ150 Mono          | 80col  | £112 |
| • Epson LQ150 Colour        | 80col  | £158 |
| • Epson LQ300               | 80col  | £140 |
| • Epson LQ570+              | 80col  | £185 |
| • Epson LQ870               | 80col  | £350 |
| • Epson LQ1070+             | 132col | £282 |
| • Epson LQ1170              | 132col | £400 |
| • Epson DLQ3000             | 132col | £672 |
| • NEC P2Q                   | 80col  | £98  |
| • NEC P3Q                   | 132col | £178 |
| • NEC P62                   | 80col  | £315 |
| • NEC P72                   | 132col | £372 |
| • NEC P90                   | 132col | £549 |
| • Panasonic KX-P2023        | 80col  | £108 |
| • Panasonic KX-P2124        | 80col  | £198 |
| • Panasonic KX-P1624        | 132col | £210 |
| • Panasonic KX-P2135 Colour | 80col  | £124 |
| • Panasonic KX-P3626        | 132col | £259 |
| • Star LC24-20 II           | 80col  | £113 |
| • Star LC24-15 II           | 132col | £232 |
| • Star LC24-300 Colour      | 80col  | £178 |
| • Star LC240 Mono           | 80col  | £90  |
| • Star LC240 Colour         | 80col  | £103 |
| • Star XB24-200 Colour      | 80col  | £315 |
| • Star XB24-250 Colour      | 132col | £385 |

## Ribbons/Ink Cartridges

(Manufacturers Original Ribbons Only)

| Type                         | Black | Colour |
|------------------------------|-------|--------|
| • Canon BJ10ex/BJ10sx        | £14   | -      |
| • Canon BJ200/BJ230          | £16   | -      |
| • Canon BJ300/BJ330          | £11   | -      |
| • Canon BJC600               | £6    | £7     |
| • Canon BJC800               | £16   | £22    |
| • Canon BJC4000              | £7    | £13    |
| • Citizen 120D+              | £4    | -      |
| • Citizen Swift 200/240/ABC  | £4    | £13    |
| • Citizen Swift 24X          | £8    | £18    |
| • Epson LX400/LX850/FX870    | £4    | -      |
| • Epson LX100                | £4    | -      |
| • Epson LX1050/FX1170        | £5    | -      |
| • Epson LQ100                | £4    | -      |
| • Epson LQ150                | £4    | £12    |
| • Epson LQ570/870            | £5    | -      |
| • Epson LQ1070/1170          | £8    | -      |
| • Epson LQ2550               | £8    | £16    |
| • Epson SQ870/SQ1170         | £21   | -      |
| • Epson Stylus Colour        | £-    | £29    |
| • Epson Stylus 300           | £12   | -      |
| • Epson Stylus 800/1000      | £10   | -      |
| • Fujitsu DL1150/DL1250      | £5    | £7     |
| • Fujitsu DL3600             | £6    | £12    |
| • Fujitsu B100/B200          | £18   | -      |
| • HP DeskJet Std Capacity    | £-    | £21    |
| • HP DeskJet High Capacity   | £20   | -      |
| • HP DeskJet 310             | £15   | £21    |
| • HP DeskJet 1200            | £20   | £21    |
| • HP PaintJet                | £16   | £18    |
| • HP PaintJet XL300          | £16   | £18    |
| • Kaga/Taxan KP810/815       | £5    | -      |
| • NEC P3Q/P32Q               | £8    | -      |
| • NEC P62/72/90              | £8    | £14    |
| • Panasonic 1150/1170/1180   | £7    | -      |
| • Panasonic 2180/23/24/35    | £7    | £14    |
| • Panasonic 1624/2624        | £8    | -      |
| • Panasonic KXP3626/3696     | £11   | -      |
| • Star LC10/LC20/LC100       | £5    | £9     |
| • Star LC100/200             | £5    | £11    |
| • Star LC24-20/24-100/24-200 | £5    | £12    |
| • Star LC24-30               | £8    | £12    |
| • Star XB24/ZA200/ZA250      | £5    | £12    |
| • Star SJ48                  | £15   | -      |
| • Star SJ144 Thermal         | £6    | £8     |

## Inkjet Printers

|                        |        |       |
|------------------------|--------|-------|
| • Canon BJ10sx         | 80col  | £145  |
| • Canon BJ130sx        | 80col  | £POA  |
| • Canon BJ200          | 80col  | £180  |
| • Canon BJ230          | 132col | £239  |
| • Canon BJ300          | 80col  | £351  |
| • Canon BJ330          | 132col | £390  |
| • Canon BJC70          | 80col  | £POA  |
| • Canon BJC600         | 80col  | £335  |
| • Canon BJC800         | 132col | £1065 |
| • Canon BJC820 (Mac)   | 132col | £1228 |
| • Canon BJC4000 Colour | 80col  | £237  |
| • Citizen Projlet IIC  | 80col  | £219  |
| • Epson Stylus 300     | 80col  | £138  |
| • Epson Stylus 400     | 80col  | £130  |
| • Epson Stylus 800+    | 80col  | £168  |
| • Epson Stylus 1000    | 132col | £311  |
| • Epson Stylus Colour  | 80col  | £327  |
| • Epson SQ870          | 80col  | £415  |
| • Epson SQ1170         | 132col | £580  |
| • Fujitsu B100         | 80col  | £145  |



NEW

|                 |      |
|-----------------|------|
| HP DeskJet 540  | £205 |
| HP DeskJet 660C | £POA |
| HP DeskJet 850C | £POA |

|                                    |        |       |
|------------------------------------|--------|-------|
| • HP DeskJet 320                   | 80col  | £165  |
| • HP DeskJet 320 & CSF             | 80col  | £180  |
| • HP DeskJet 1200C                 | 80col  | £630  |
| • HP DeskJet 1200C PS              | 80col  | £945  |
| • HP DeskJet 1600C                 | 80col  | £POA  |
| • HP PaintJet XL300+ A4            | 80col  | £1599 |
| • HP PaintJet XL300+ A3            | 132col | £1769 |
| • HP PaintJet XL300 PS A4          | 80col  | £2568 |
| • HP PaintJet XL300 PS A3          | 132col | £2719 |
| • Star SJ48                        | 80col  | £182  |
| • Star SJ144                       | 80col  | £178  |
| • Star Wintype 800C Thermal Colour |        | £592  |

## Sheet Feeders

|                            |      |
|----------------------------|------|
| • Canon BJ10ex/BJ10sx      | £40  |
| • Canon BJ300              | £88  |
| • Canon BJ330              | £92  |
| • Citizen Swift 24/200/240 | £75  |
| • Epson LX400              | £69  |
| • Epson LQ570/LQ870        | £47  |
| • Epson LQ1070/LQ1170      | £89  |
| • HP DeskJet 310/320       | £48  |
| • NEC P20/P22Q             | £59  |
| • NEC P3Q/P32Q             | £85  |
| • Panasonic 1170/1180/1123 | £59  |
| • Panasonic 1124/1124/1214 | £79  |
| • Panasonic 1824/2824      | £128 |
| • Panasonic KX-P2135       | £30  |
| • Star LC100               | £69  |
| • Star LC24-20             | £69  |
| • Star LC200/LC24-200      | £69  |

## INKJET REFILL PACKS FOR:

|  |     |
|--|-----|
| • Canon BJ10ex/BJ10sx - 2 pack         | £12 |
| • Canon BJ10ex/BJ10sx - 5 pack         | £24 |
| • Canon BJ10ex Cart & 3 Refills        | £29 |
| • Canon BJ200 2 Refills                | £34 |
| • Epson SQ 870/1170 - 2 Refills        | £9  |
| • HP DeskJet Std Capacity - 2 pack     | £8  |
| • HP DeskJet Hi-Capacity - 2 pack      | £24 |
| • HP DeskJet Std Capacity - 5 pack     | £14 |
| • HP DeskJet Hi-Capacity - 5 pack      | £35 |
| • HP DeskJet Colour - Cart & 4 Refills | £49 |

## Accessories

|  |      |
|--|------|
| • Citizen Swift 200/240/ABC Colour Kit | £32  |
| • Citizen Projlet II Cartridge         | £3   |
| • Canon BJ10sx Battery Pack            | £32  |
| • Epson OK Serial Interface            | £29  |
| • Epson 8K Serial Interface            | £75  |
| • Epson 32K Serial Interface           | £95  |
| • Epson LQ100 Tractor Unit             | £29  |
| • HP DeskJet FX Emulation Cartridge    | £49  |
| • HP DeskJet IBM Emulation Cartridge   | £57  |
| • HP DeskJet 256K RAM Cartridge        | £45  |
| • HP DeskJet 310 Black Cartridge       | £14  |
| • HP DeskJet 310 Battery Pack          | £33  |
| • HP DeskJet Carry Case                | £49  |
| • HP DeskJet 310 Colour Kit            | £28  |
| • HP DeskJet 1200 Postscript Upgrade   | £499 |
| • HP DeskJet Prestige Elite Fonts      | £55  |
| • HP DeskJet Letter Gothic Fonts       | £56  |
| • HP DeskJet 310 Parallel Cable        | £12  |
| • Panasonic Serial Interface           | £49  |
| • Panasonic 32K Buffer                 | £16  |
| • Panasonic 2180/2123 Colour Kit       | £30  |
| • Star 8K Serial Interface - LC range  | £52  |
| • Star 8K Serial Interface - XB range  | £39  |
| • Star 32K Buffer - LC24/XB24          | £52  |
| • Dustcovers for 80col printers        | £6   |
| • Dustcovers for 132col printers       | £9   |

## LUTON SHOWROOM

Finway, Dallow Road, Luton, Beds.  
Tel: 01582 74 55 55

## WATFORD SHOWROOM

250 Lower High Street, Watford, Herts.  
Tel: 01923 23 77 74

## HP On-site Warranty Packs

| Model                     | 1yr  | 3yr  |
|---------------------------|------|------|
| Mono DeskJet/Deskwriter   | £32  | £40  |
| Colour DeskJet/Deskwriter | £45  | £85  |
| LaserJet 4L/4ML           | £78  | £100 |
| LaserJet 4+/4M+           | £135 | £185 |
| LaserJet 4V/4MV           | £425 | £485 |

## Manual Printer Sharers

| Connects | Serial | Parallel |
|----------|--------|----------|
| • 2 to 1 | £12    | £13      |
| • 3 to 1 | £15    | £17      |
| • 4 to 1 | £24    | £26      |
| • 5 to 1 | -      | £38      |

## Crossover Sharers

| Connects     | Serial | Parallel |
|--------------|--------|----------|
| • 2 in/2 out | £28    | -        |
| • 4 in/2 out | -      | £49      |

## Auto Printer Sharers

| Connects | Uni-Directional | Parallel |
|----------|-----------------|----------|
| • 2 to 1 | £27             | £29      |
| • 4 to 1 | £44             | £45      |
| • 8 to 1 | £62             | -        |
| Connects | Bi-Directional  | Parallel |
| • 2 to 1 | £29             | £29      |
| • 4 to 1 | -               | £35      |

256K RAM module for above £59



# Monitors & Video Cards

# Hard Drives

# Input Devices

## Aries 14" VGA Monitors

**Mono: 14" Flat Screen Paper White £85**  
**Colour Super VGA LR:** State of Art Colour Monitor, Swedish Low Radiation MPRII, supporting resolution of upto 1024 x 768 with an 0.28mm dot pitch tube. (EPA: EnergyStar Compliant)  
 • EnergyPro 14" SVGA Colour MPRII £165  
 • Above with 512K SVGA Card £185

## Aries Multiscan Monitors



The NEW Aries Multiscan monitors, with Horizontal Frequency ranging from 29KHz to 75KHz providing rock solid images at resolutions of upto 1280 x 1024 Non-Interlaced, coupled with the 0.28mm dot pitch Picture Tube provides the Ultra High Image that is expected from the Aries range of Low Radiation Swedish MPRII Standard Monitors. Supplied complete with tilt and swivel base.

- **Aries Alphascan Pro LR**  
1024 x 768/72Hz (NI) H-Sync 70KHz, Front Mounted user controls £199
- **Aries EnergyPro 6000i LR**  
15" Colour Display, 0.28mm dot pitch, 1280 x 1024/60Hz NI, Microprocessor Control with digital display, Incl. Pincushion, Trapezoid, Rotation settings. EPA EnergyStar Compliant £239
- **Aries EnergyPro 7560i LR**  
17" Flat Screen 0.28mm, 1280 x 1024/70Hz (NI) H-Sync 80KHz, Microprocessor Controls incl. Pincushion, Trapezoid, Rotation & Individual RGB Colours. EPA EnergyStar Compliant £449

## Multiscan Monitors

|                   |       |                          |       |
|-------------------|-------|--------------------------|-------|
| Hitachi 17MVX     | £579  | Taxan EV410LR            | £190  |
| NEC 2V            | £225  | Taxan EV420LR            | £239  |
| NEC XV15          | £279  | Taxan Ergo 580LR         | £282  |
| NEC XE15          | £389  | Taxan Ergo 885LR         | £624  |
| NEC XV17          | £559  | Taxan Ergo 880LR         | £509  |
| NEC XE17          | £696  | Taxan Ergo 895LR         | £834  |
| NEC XP17          | £905  | Taxan Ergo 1080LR        | £909  |
| NEC XE21          | £1329 | Taxan Ergo 2100LR        | £1530 |
| NEC XP21          | £1759 | Taxan Ultra 1095LR       | £1458 |
| Panasync TX-D1731 | £479  | Phil 14C 14"             | £163  |
| Pro 5             | £479  | Phil 15B 15"             | £254  |
| Panasync TX-T1537 | £319  | Phil 17C 17"             | £427  |
| Panasync TX-D1751 | £599  | Phil 20C 20"             | £840  |
| Panasync TX-D1732 | £535  | Phil 20T 20"             | £1315 |
| Panasync TX-D2032 | £1125 | Sony CPD-15SF1           | £287  |
| Panasync Pro 7    | £1359 | Sony GDM-17SE1 17" £819  |       |
| TX-D2131          | £1359 | Sony GDM-20SE1VT £1315   |       |
| Taxan EV400LR     | £180  | Sony GDM-20SE1 20" £1409 |       |

Panasonic monitors carry 2 years on-site maintenance warranty

## Controller Cards

|                                 |   |  |      |
|---------------------------------|---|--|------|
| <b>ISA</b>                      |   |  |      |
| CEA 0110                        | Multi I/O - 2S/1P/1G  |  | £9   |
| CEA0290                         | Multi I/O - IDE/FDD/2S/1P/1G                                      |  | £11  |
| CEA1910                         | Multi I/O - IDE/FDD/2S (16550)/1P (EPP) (Enhanced IDE/2.88Mb FDD) |  | £39  |
| CEA2400                         | Multi I/O - 2S (16550)1p  |  | £32  |
| CEA0230                         | 2x IDE/2x FDD Controller  |  | £9   |
| CEA0100                         | Dual RS232 Serial Port Card                                       |  | £8   |
| CEA2410                         | Enhanced 16550 Serial Port Card                                   |  | £29  |
| CEA0110                         | Parallel Port Card  |  | £9   |
| CEA0300                         | Game Port Card  |  | £11  |
| <b>ISA Caching Controllers</b>  |   |  |      |
| Promise DC-100                  | OK  |  | £69  |
| Promise DC-100                  | 1Mb   |  | £95  |
| Promise DC-200                  | OK  |  | £75  |
| <b>VESA Local Bus</b>           |   |  |      |
| CEA1610                         | Multi I/O - IDE/FDD/2S (14550)/1P/1G (Enhanced IDE/1.44Mb FDD)    |  | £28  |
| CEA1900                         | Multi I/O - IDE/FDD/2S (16550)/1P (EPP) (Enhanced IDE/2.88Mb FDD) |  | £39  |
| CEA2060                         | Multi I/O - IDE/FDD/2S/1P   |  | £16  |
| <b>SCSI Controllers</b>         |   |  |      |
| Adaptec 1542 Controller Kit     | ISA   |  | £174 |
| Adaptec 1542 Controller Bare    | ISA   |  | £132 |
| Adaptec 2842 Controller Kit     | VLB   |  | £198 |
| Adaptec 2940 Controller Kit     | PCI   |  | £239 |
| Adaptec 2742 Controller Kit     | EISA  |  | £289 |
| Promise DC2040                  | ISA   |  | £149 |
| Future Domain TMC1610MCD 16 bit |   |  | £89  |
| Future Domain TMC850MCD 8 bit   |   |  | £45  |

## MS Input Devices

- MS Mouse v2 (Serial) £35
- MS Mouse v2 (PS/2) £35
- MS Bus Mouse £48
- MS HomeMouse £27
- MS Natural Keyboard £69

## Graphics Card

- 256K VGA Card ISA £21
- 512K SVGA Card ISA £27
- 1Mb Super VGA ISA £39
- 1Mb S3 805 Graphics Card VLB £58
- DIAMOND**
- 1Mb SpeedStar Pro ISA £89
- 1Mb SpeedStar 64 ISA £99
- 2Mb SpeedStar 64 ISA £139
- 1Mb SpeedStar Pro VLB £88
- 1Mb SpeedStar 64 PCI £104
- 1Mb Stealth 64 DRAM VLB £96
- 2Mb Stealth 64 DRAM VLB £127
- 2Mb Stealth 64 VRAM VLB £231
- 4Mb Stealth 64 VRAM VLB £318
- 2Mb Viper SE VRAM VLB £245
- 4Mb Viper SE VRAM VLB £348
- 1Mb Stealth 64 DRAM PCI £97
- 2Mb Stealth 64 DRAM PCI £135
- 2Mb Stealth 64 VRAM PCI £216
- 4Mb Stealth 64 VRAM PCI £340
- 2Mb Viper SE VRAM PCI £248
- 4Mb Viper SE VRAM PCI £355
- MATROX**
- 2Mb Matrox MGA Ultima VLB £305
- 2Mb Matrox MGA Ultima+ VLB £328
- 2Mb Matrox MGA Impression+ PCI £285
- ORCHID**
- 1Mb Kelvin EZ VLB £87
- 1Mb Kelvin EZ PCI £88
- 1Mb Kelvin 64 ISA £98
- 2Mb Kelvin 64 ISA £129
- 1Mb Kelvin 64 PCI £98
- 2Mb Kelvin 64 PCI £129
- 1Mb Kelvin 64 VLB £97
- 2Mb Kelvin 64 VLB £130
- 1Mb Fahrenheit 64 PCI £117
- 2Mb Fahrenheit 64 PCI £155
- 1Mb Fahrenheit 64 VLB £118
- 2Mb Fahrenheit 64 VLB £154
- 2Mb Fahrenheit Pro 64 PCI £244
- 4Mb Fahrenheit Pro 64 PCI £345
- 2Mb Fahrenheit Pro 64 VLB £242
- 4Mb Fahrenheit Pro 64 VLB £346

- **SPEA**
- 1Mb V7 Mirage P64 VLB £122
- 2Mb V7 Mercury P64 VLB £246
- 2Mb V7 Mirage P64 PCI £179
- 2Mb V7 Mercury P64 PCI £247

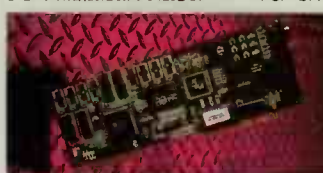


## TAXAN

- Ultra Pro 2Mb MCA £228
- Ultra Pro 2Mb EISA £229
- WinBoost ISA £114
- WinBoost VLB £115
- WinBoost PCI £116
- 2Mb GTS WinTurbo ISA £248
- 2Mb GTS WinTurbo VLB £249
- 2Mb GTS WinTurbo PCI £250
- 4Mb WinTurbo Plus ISA £398
- 4Mb WinTurbo Plus VLB £399
- 4Mb WinTurbo Plus PCI £400

## TECHWORKS

- 1Mb ThunderBolt 64 DRAM ISA £95
- 2Mb ThunderBolt 64 DRAM ISA £129
- 1Mb ThunderBolt 64 DRAM VLB £96
- 2Mb ThunderBolt 64 DRAM VLB £132
- 1Mb ThunderBolt 64 DRAM PCI £97
- 2Mb ThunderBolt 64 DRAM PCI £134
- 1Mb ThunderBolt-T 9420DGi PCI £75
- 2Mb ThunderBolt-T 9420DGi PCI £116



## AT IDE Hard Drives

|                        |        |      |      |  |      |
|------------------------|--------|------|------|--|------|
| <b>CONNER</b>          |        |      |      |  |      |
| CFA540A                | 540Mb  | 12ms | 3.5" |  | £149 |
| CFA850A                | 850Mb  | 12ms | 3.5" |  | £258 |
| CFA1080A               | 1Gb    | 12ms | 3.5" |  | £384 |
| <b>HITACHI</b>         |        |      |      |  |      |
| DK221A-34              | 340Mb  | 11ms | 2.5" |  | £215 |
| DK211A-51              | 510Mb  | 11ms | 2.5" |  | £299 |
| DK212A-81              | 810Mb  |      | 2.5" |  | £495 |
| DK212A-10              | 1Gb    | 10ms | 2.5" |  | £649 |
| DK328C-10              | 1Gb    |      | 3.5" |  | £POA |
| <b>IBM</b>             |        |      |      |  |      |
| 84G8998                | 1Gb    |      | 3.5" |  | £229 |
| <b>MAXTOR</b>          |        |      |      |  |      |
| 7420AV                 | 420Mb  | 12ms | 3.5" |  | £125 |
| 7540AV                 | 540Mb  | 12ms | 3.5" |  | £139 |
| <b>QUANTUM</b>         |        |      |      |  |      |
| Maverick               | 540Mb  | 10ms | 3.5" |  | £129 |
| <b>SEAGATE</b>         |        |      |      |  |      |
| ST3491A                | 428Mb  | 12ms | 3.5" |  | £116 |
| ST3660A                | 545Mb  | 12ms | 3.5" |  | £139 |
| ST5850A                | 850Mb  | 12ms | 3.5" |  | £199 |
| ST31220A               | 1050Mb | 12ms | 3.5" |  | £299 |
| ST9190AG               | 172Mb  | 16ms | 2.5" |  | £189 |
| ST9385AG               | 341Mb  | 16ms | 2.5" |  | £239 |
| ST9550AG               | 455Mb  | 16ms | 2.5" |  | £387 |
| <b>WESTERN DIGITAL</b> |        |      |      |  |      |
| AC2420                 | 420Mb  | 12ms | 3.5" |  | £115 |
| AC2540                 | 540Mb  | 12ms | 3.5" |  | £145 |
| AC2700                 | 740Mb  | 10ms | 3.5" |  | £169 |
| AC31000                | 1.1Gb  | 10ms | 3.5" |  | £285 |
| AC2850                 | 810Mb  | 10ms | 3.5" |  | £189 |

Disk Manager v7. NEW! Now supports DOS OS/2 NT & W95. Overcomes large IDE drive (>528Mb) problems on older BIOS. Only £28 when purchased with a hard disk drive.

## SCSI Hard Drives

|                              |        |      |      |  |       |
|------------------------------|--------|------|------|--|-------|
| <b>FUJITSU</b>               |        |      |      |  |       |
| M2682S                       | 355Mb  | 12ms |      |  | £135  |
| M2684S                       | 532Mb  | 12ms |      |  | £162  |
| M1606SA                      | 1.1Gb  | 10ms |      |  | £379  |
| M2903SA                      | 2.0Gb  | 12ms |      |  | £828  |
| M2909S                       | 3.0Gb  | 11ms |      |  | £1125 |
| <b>IBM (5 year warranty)</b> |        |      |      |  |       |
|                              | 1.0Gb  | 9ms  |      |  | £369  |
| 0664-M1H                     | 2.0Gb  | 10ms |      |  | £799  |
| Wildcat                      | 4.0Gb  | 9ms  |      |  | £1550 |
| <b>HITACHI</b>               |        |      |      |  |       |
| DK326C-10                    | 1Gb    | 10ms |      |  | £345  |
| <b>QUANTUM</b>               |        |      |      |  |       |
| Maverick                     | 540Mb  | 12ms | 3.5" |  | £179  |
| Empire                       | 1.08Gb | 9ms  | 3.5" |  | £399  |
| Empire                       | 1.4Gb  | 9ms  | 3.5" |  | £645  |
| Empire                       | 2.1Gb  | 9ms  | 3.5" |  | £845  |
| <b>SEAGATE</b>               |        |      |      |  |       |
| ST3390N                      | 341Mb  | 12ms |      |  | £215  |
| ST3655N                      | 545Mb  | 12ms |      |  | £239  |
| ST31200N                     | 1.05Gb | 9ms  |      |  | £369  |
| ST12550N                     | 2.1Gb  | 9ms  |      |  | £735  |
| ST15150N                     | 4Gb    |      |      |  | £1585 |

## SCSI Cables & Accessories

|                                       |      |
|---------------------------------------|------|
| Single Drive Cable (Internal IDC)     | £8   |
| Dual Drive Cable (Internal IDC)       | £9   |
| Cent. to Cent. 50 way                 | £16  |
| 25 way D'Connector to 50 way Cent.    | £16  |
| 25 way Mini D'Conn. to 50 way Cent.   | £25  |
| 25 way Mini D'Conn. to 25 way Mini D' | £26  |
| Removable SCSI Drive Rack             | £29  |
| External Case with PSU                | £POA |

## Removable Drives

|                |                 |               |      |
|----------------|-----------------|---------------|------|
| <b>Syquest</b> |                 |               |      |
| SQ3105A        | 105Mb           | IDE Internal  | £215 |
| SQ3105S        | 105Mb           | SCSI Internal | £235 |
| SQ3270A        | 270Mb           | IDE Internal  | £289 |
| SQ3270S        | 270Mb           | SCSI Internal | £290 |
| SQ400          | 44Mb Cartridge  |               | £44  |
| SQ310          | 105Mb Cartridge |               | £41  |
| SQ327          | 270Mb Cartridge |               | £51  |

## Parallel Port Drives

|                                    |      |             |      |
|------------------------------------|------|-------------|------|
| <b>BackPack Hard Disk Drives</b>   |      |             |      |
| 420Mb                              | £326 | 850Mb       | £495 |
| <b>BackPack Floppy Disk Drives</b> |      |             |      |
| 3.5" 1.44Mb                        | £115 | 5.25" 1.2Mb | £131 |
| <b>BackPack CD ROM Drives</b>      |      |             |      |
| Dual Speed                         |      |             | £314 |
| 4S Quad Speed                      |      |             | £349 |
| <b>BackPack Tape Drives</b>        |      |             |      |
| BP 1080 250Mb (QIC-80)             |      |             | £218 |
| BP 90 680Mb                        |      |             | £369 |

## PC Mouse

- 2 Button Aries Mouse (Serial) £12
- 2 button Mouse (Serial) £8
- 2 button PS/2 Mouse £8

## Logitech Products

|  |      |
|--|------|
| <b>SCANNERS</b>                              |      |
| ScanMan - Colour 24 bit with OmniPage Direct | £165 |
| ScanMan EasyTouch                            | £117 |
| ScanMan PowerPage                            | £298 |
| ScanMan 256 PC Win                           | £96  |
| ScanMan 32 PC Win with OmniPage Direct       | £63  |
| <b>MOUSE</b>                                 |      |
| Chroma Mouse                                 | £24  |
| Mouseman Sensa Mouse                         | £38  |
| Mouseman Bus                                 | £38  |
| My Mouse                                     | £18  |
| MouseMan Cordless (Small)                    | £49  |
| MouseMan 10 pack Bulk                        | £249 |
| Pilot II Mouse - Serial                      | £17  |
| Pilot II Mouse - PS/2                        | £17  |
| <b>TRACKERBALL</b>                           |      |
| Pilot TrackMan                               | £27  |
| TrackMan Voyager                             | £48  |
| TrackMan II Combo (Serial/PS2)               | £42  |
| TrackMan Portable (Serial/PS2)               | £32  |
| <b>JOYSTICK</b>                              |      |
| CyberMan                                     | £59  |
| WingMan                                      | £25  |
| WingMan Extreme                              | £32  |
| <b>MULTIMEDIA</b>                            |      |
| AudioMan                                     | £76  |
| SoundMan Wave Sound Card                     | £139 |
| FotoMan Plus                                 | £376 |

## Genius Products

|   |     |
|---|-----|
| <b>Mouse 3+</b>   |     |
| Includes powerful imaging software:   |     |
| PC Paintbrush for Windows, Media Mate Presentation Software, MouseMate Driver and Pad | £20 |
| Mouse 3 with Driver only  | £12 |
| <b>HiMouse The Advanced Mouse</b>   |     |
| HiMouse - Serial  | £19 |
| HiMouse - Serial & PS/2   | £21 |
| HiMouse - Cordless  | £20 |
| Mouse Too & Mouse 3   |     |
| MouseToo - 350-1050dpi  | £11 |
| Mouse 3 (Driver only)   | £12 |
| Mouse 3+ Includes powerful imaging software   |     |
|   | £20 |
| <b>HiMouse Lite</b>   |     |
| High performance Optical Mouse  | £35 |
| <b>HiPoint</b>  |     |
| The Smart Mini-Trakerball   | £19 |
| HiTrak - (Serial & PS/2)  | £22 |



|   |      |
|---|------|
| <b>New Sketch</b>                         |      |
| New Sketch 1812                           | £185 |
| New Sketch 1812D                          | £209 |
| <b>ScanMate 32 &amp; 256</b>              |      |
| Black and White scanner with 32 Halftones | £49  |
| 256 true grey scale & B/W scanner         | £65  |



|  |      |
|--|------|
| <b>ScanMate Colour</b>   |      |
| ScanMate Colour, 24 bit 800 dpi Scanner  | £155 |
| <b>Easy Painter</b>  |      |
| Amazing value graphics tablet gives you the chance to exercise your creativity. Includes PC Paintbrush for Windows that provides dozens of natural paint tools, complete Utilities Disk, Stylus Pen and keyboard power adaptor |      |
| Max dpi is dependent on available system memory.   | £67  |



# Memories, Modems, Data-Storage, Facsimile, Spares, Accessories



## Motherboards

- CEA1800** – (VLB) 486 Upgradeable MB, 256 Cache, ZIF (3 x VLB, 4 x ISA slots).  
Memory: 2 x 72 Pin, 4 x 30 Pin) £58
- CEA5000** – (PCI) EnergyStar 486 Upgradeable MB (to Pentium Overdrive), (EPP, ECP), 256K Cache, IDE, Dual Serial Ports, (16550) 3 PCI Slots, White ZIF £109
- CEA5010** – (PCI) Pentium P60/66MHz MB, 256K Cache, On-Bd PCI Enh. IDE, Upg. to 192Mb White ZIF £135
- CEA5050** – (PCI) Pentium P90MHz MB, 256K Cache, On-Bd PCI IDE, Enhanced Parallel, Fast 16550 Dual Serial Ports, 3 PCI Ports, White ZIF £149

## Processors

- INTEL**
- CIA0070 i486SX2-50MHz £62
- CIA0020 i486SX-33MHz £58
- CIA0060 i486DX2-66MHz £119
- CIA0100 Pentium P60MHz £198
- CIA0110 Pentium P66MHz £219
- CIA0750 Pentium P75MHz £249
- CIA0120 Pentium P90MHz £379
- AMD**
- CIA0720 AMD486DX2-66MHz £98
- CIA0730 AMD486DX2-80MHz £109
- CIA0740 AMD486DX4-100MHz £169

## PC AT Keyboards

- All keyboards are with 102 keys
- EntryLevel (ELV) Keyboard £14
  - Aries Click-Action (Alps Keys with Dustcover) £29
  - KeyPro Programmable Keyboard with LCD Calculator, Diagonal Cursor Keys, keylock £49
  - KeyTrack Keyboard with built-in Trackerball £39
  - Cherry G83-6000 Membrane £18
  - Cherry G83-3210 Membrane £23
  - Cherry G80-3000 Click-Action £33
  - Cherry G81-3000 Soft-Action £31
  - MS Natural Keyboard £67

## PC Spares

- CPU Cooling Fan with Heatsink (486) £12
- CPU Cooling Fan with Heatsink (Pentium - P60/P66) £16
- CPU Cooling Fan P90 £19
- Coiled Keyboard Extension Lead £6
- PS/2 - AT Keyboard Adapter £4
- 200W PSU Unit (Desktop/Mini Tower) £25
- 230W PSU Unit (Full Tower) £39

## Roland Plotters

- DXY1150 £575 ● DXY1250 £725
- DXY1350 £939 ● DPX2800 £90A
- Sketchmate A4 £335 ● S/Mate A3 £499

## Floppy Disk Drives

- UC600 5.25" 1.2M 96tpi Double Sided High Density, Disk Drive £35
  - UC35/6 3.5" 1.44M Drive £22
  - 5.25" Fixing kit for 3.5" Drives £5
  - UC35/55 - Combined 3.5" 1.44Mb & 5.25" 1.2Mb FDD £85
  - US35/9 3.5" 4Mb (2.88Mb when formatted) Drive (Capable of reading/writing 720K & 1.44MB) £62
  - 5 Head Floppy Cable £5
- Includes power/data adapters*

## X-Link Fax/Modems

- XL-1441** Internal 14400bps V.Fast, V32bis, V42bis, MNP5 £87
- XL-144E** External 14400bps V.Fast, V32bis, V42bis, MNP5 £89
- XL-V341** Internal 28800bps V34, V32bis, V42bis, MNP5 £179
- XL-V34E** External 28800bps V34, V32bis, V42bis, MNP5 £185

All Watford modems are BABT approved, have a 3 year warranty & come with Winfax Lite

| IBM PCMCIA Fax/Modems<br>Ideal for Thinkpads |      |     |
|--|------|-----|
| 14.4   | £129 | £59 |
|  | 9624 |     |

## PACE Fax/Modems

Manufacturer's 5 Year No-Quibble Warranty

- DESKTOP MODEM**
- Pace - Mobilfax £75
- Pace - Mobilfax 14.4 £98
- Linnet Quad + Fx - V22bis, V42, V42bis £80
- Linnet 32+ V.Fx - V32bis, Datafax & Voice £155
- Linnet 34 V.Fx £269
- Ultralink 32+ - LCD panel, V32bis, leased line £330
- POCKET & PC CARD**
- Microlin Fx - Internal Card £79
- Microlin Fx - Pocket Unit £94
- Microlin Fx 32+ - Internal Card £134
- Microlin Fx 32+ - Pocket Unit £149
- PCMCIA Fax Modem**
- Microlin Fx NB24 £124
- Microlin Fx NB32+ £190
- Except for Linnet, all PACE Fax/Modems are supplied with Cables, Win/DosFax & COMH software

## US Robotics Modems

|   | Int  | Ext  |
|---|------|------|
| Sportster 14.4 Fax/Modem                | £126 | £126 |
| Sportster 28.8 Fax/Modem                | £199 | £193 |
| Worldport Dual Cellular                 |      | £168 |
| Courier v34 Fx/Md                       | £260 | £260 |
| Worldport PCMCIA 2496 Fx/Md             |      | £129 |
| Worldport Dual standard cellular PCMCIA |      | £193 |
| Connecting Cable 9/25                   |      | £8   |

Price includes software.

## Dataflex Fax/Modems

- SPECIAL OFFER**
- GEM Fax Pocket V22bis £39**  
While stocks last
- SuperGEM Portable V32bis 14.4K £115**
- Rapier Plus Desktop £338**
- 3 year warranty  
Complete with Cables & Software

## PC Joysticks

- SUNCOM**
- Analogue Xtra £19
  - FX2000 - the Ultimate Stick £20
  - Flight Yoke £49
  - Command Control £16
  - Quick Shot Aviator 5 £29
  - 2-into-1 Joystick Adapter £5
  - Flight Max £24
  - Axis £18
  - NEW! G-Force Flight Yoke £37
- CH PRODUCTS**
- NEW! Flightstick £29
  - NEW! Flightstick Pro £54



## Scanners



- AT - HP-Scanjet 3P £338 IICX £686
- PS/2 - HP-Scanjet 3P £338 IICX £686
- HP Auto Doc Feeder 3P £145 IIC £265

## EPSON

Epson A4, 24 bit colour Flatbed Scanner:  
Supplied complete with Pic. Publisher LE,  
Omni Direct OCR, Interface Card &  
Cables

- GTX6500 Parallel I/F £508
- GTX6500 SCSI I/F £567
- GTX8000 Parallel £660
- GTX8000 SCSI £720
- GTX9000 SCSI £905

## Canon

- Canon IX-4015 Colour Scanner with AT-SCSI Interface & OFOTO Software £579

## Pisio Computers



- Ser3A 256K £229 ● Ser 3A 512K £245
- **RAM Solid State Discs (SSD)**
- 128K £48; ● 512K £97 ● 1Mb £199
- **Flash Solid State Discs (SSD)**
- 128K £30; ● 256K £48 ● 512K £79
- 1Mb £139; ● 2Mb £199
- Parallel Interface Link £24
- RS 232 Serial Link for PC £58; Mac £59
- Mains Adaptor 9V AC £12
- Professional Finance £47
- Spelling Checker/Thesaurus £39
- Spreadsheet £50 ● WinLink £25
- Leather Case £21 ● Desk Stand £15
- Finance Pack £50 ● Paint and compose £58
- Games Pack 3 £28 ● VT100 Emulator £49
- Comcard Compute-a-diet £98
- WINLink Windows upgrade to serial link £24
- Black Anodised Aluminium Desk Stand £14

## Memory (RAM) Simms

|                |      |                 |      |
|----------------|------|-----------------|------|
| 256K 3 Chip    | £18  | 4Mb - 1Mb x 36  | £116 |
| 1Mb x 9 3 Chip | £34  | 8Mb - 2Mb x 32  | £219 |
| 1Mb x 9 9 Chip | £42  | 8Mb - 2Mb x 36  | £259 |
| 4Mb x 9 9 Chip | £115 | 16Mb - 4Mb x 32 | £232 |
| 4Mb - 1Mb x 32 | £115 | 16Mb - 4Mb x 36 | £339 |

## Maths Co-Processors

|                  |     |                  |      |
|------------------|-----|------------------|------|
| 8087-4.77MHz     | £87 | 80387DX-         |      |
| 80287-20MHz      | £45 | 20/25/33MHz      | £42  |
| 80387SX-16/20MHz | £38 | 80387DX-40MHz    | £45  |
| 80387SX-25MHz    | £38 | 80487SX-25MHz    | £275 |
| 80387SX-33MHz    | £42 | Overdrive 486SX- |      |
| 80387SX-40MHz    | £44 | 25MHz-50M        | £188 |

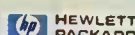
## Computer Cases - Chic

- Mini Tower Case with PSU £38
- Midi Tower Case with PSU £65
- Full Tower Case with PSU £79
- Slim Line (Desk) Case with PSU £44
- Desk Top Std Case with PSU £38
- Multimedia Case with PSU (Desktop) £78

## Fax Machines

|            |      |             |      |
|------------|------|-------------|------|
| HP Fax 900 | £545 | Pana UFV60  | £340 |
| HP Fax 950 | £695 | Pana UF321  | £580 |
| Pana UFV40 | £259 | Pana UF322E | £685 |

## Tape Streamers



- HP Colorado**
- DJ-20 250Mb Internal £92
- DJ-35 350Mb Internal £112
- DJ-25 680Mb Internal £165
- KE-10 PC External Kit £59
- KE-15 PS/2 External Kit £77
- FC-20 Fast Tape Controller £49
- TC-15 Fast Cont with H'Ware Comp. £105

- Parallel Port Tape Drive**
- Trakker 250 JT-20 £183
- Trakker 350 JT-35 £205
- Trakker 700 JT-25 £274

- Colorado Backup Software**
- SK-7 Windows Software Pack £39
- SK-1 Sytos Plus for OS/2 £78
- SU53-J - SCO Unix/Xenix Pack £72

## iOmega Storage Solutions

|                  | Internal | External |
|------------------|----------|----------|
| 250Mb Tape Drive | £87      | £162     |
| 680 Mb Tape 700  | £185     | £259     |

## Data Cartridges

|        |     |           |     |
|--------|-----|-----------|-----|
| DC2000 | £12 | DC2120    | £9  |
| DC6150 | £11 | DC6250    | £16 |
| DC6525 | £17 | MC3000 XL | £18 |



Leasing finance at very attractive rates now available to Businesses (subject to status), Schools, Colleges, Universities, Government Depts., and Local Councils. Minimum order £1,000. Please telephone for details.

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- Showroom and shop hours: 9am to 6pm, Monday to Saturday. Late night Thursday until 8pm. Free customer car park.
- Mail Order Inquiries: 9am to 6pm, Monday to Friday only.
- Technical Inquiries: 9.30am to 5.00pm, Monday to Friday.
- VAT: UK customers please add 17.5% VAT to value of order including carriage.

## Carriage (incl. Insurance) Charges

|             | 1st Item | 2nd & Subsequent Item |
|-------------|----------|-----------------------|
| Software    | £6.00    | £2.00                 |
| Hardware    | £7.00    | £5.00                 |
| Lasers      | £9.00    | £7.00                 |
| Accessories | £6.00    | £2.00                 |
| Small Items | £6.00    | £2.00                 |

Please note that £6.00 is our minimum carriage charge.

**Standard Delivery Charges** shown above for delivery within 2-4 working days after despatch. For Express Delivery (next working day) double the total carriage. All delivery charges subject to VAT. Please allow 7 working days for delivery of orders and 28 days for non-stock orders. Above carriage charges apply to most of the UK mainland except for certain outlying areas. Please confirm when placing your order. On export orders, carriage is charged at cost.

Offers and all items are subject to availability. Prices may have to change for reasons beyond our control. Specifications on products are correct at the time of going to press and given in good faith, but may have to change without notice. Please check suitability of peripherals with your system/s, before ordering. All trademarks are acknowledged. Goods are sold subject to our standard terms and conditions of sale and are available on request. Goods are not sold on trial basis. E&OE.

# Watford Electronics Ltd.

Jessa Group of Companies - Established 1972

**Mall Order & Showroom: Finway, off Dallow Rd., LUTON, LU1 1TR, England**  
**Tel: 01582 48 77 77; Fax: 01582 488588**

**Showroom Only: 250 Lower High Street, WATFORD, WD1 2AN, England**  
**Tel: 01923 237774; Fax: 01923 233642**



# ESL

**HEAD OFFICE & SHOWROOM:**  
342 Queenstown Road,  
Battersea, London SW8 4NE  
Tel: 0171 498 7816. Fax: 0171 498 321

**NEWCASTLE OFFICE & SHOWROOM:**  
Image House  
Carloli Square  
Newcastle Upon Tyne NE1 6NQ  
Tel: 0191 222 0068. Fax: 0191 221 101



## ESL 486 VLB

- Vesa Local Bus motherboard
- Upgrade with ZIF socket
- Latest AMI WIN BIOS
- 256K cache memory
- 4MB SIMM Memory upgradable to 64MB
- Western Digital Enhance IDE hard drive
- 1.44MB Mitsubishi floppy drive
- VLB ENHANCE IDE controller card
- 2 serial, 1 parallel and 1 game port
- VLB 1MB Cirrus Logic 5429 (New)
- Desktop or Minitower case with 200w PSU Minitower
- 14" Samsung SVGA Syncmaster 3 LR monitor MPRII
- 102 key enhance UK Keyboard

### Upgrade options:

|                                   |      |
|-----------------------------------|------|
| Extra 4MB RAM                     | £99  |
| 15" Samsung 15GL monitor          | £80  |
| 17" Samsung 17GLS monitor         | £380 |
| 17" Idek Vision Master monitor    | £360 |
| Midi Tower case & 230W PSU        | £23  |
| Full Tower case & 230W PSU        | £46  |
| Cherry soft touch keyboard        | £10  |
| Fujitsu ergonomic keyboard click  | £15  |
| Microsoft natural keyboard        | £49  |
| Dos 6.22 & Windows 3.11 Workgroup | £79  |
| 3 button mouse & mat              | £10  |
| Logitech Pilot mouse              | £19  |
| Microsoft Mouse V2 2 button       | £29  |
| Fax modem US Robotics Sportster   | £129 |
| Quad speed CD Rom drive           | £135 |



| SYSTEM PRICE        | 420MB | 730MB | 850MB | 1GB  | 1.2GB |
|---------------------|-------|-------|-------|------|-------|
| 486SX 33MHZ INTEL   | £629  | £679  | £699  | £769 | £799  |
| 486SX2/50MHZ INTEL  | £639  | £689  | £709  | £779 | £809  |
| 486DX2/66MHZ AMD    | £689  | £739  | £759  | £829 | £859  |
| 486DX2/66MHZ INTEL  | £699  | £749  | £769  | £839 | £869  |
| 486DX2/80MHZ AMD    | £699  | £749  | £769  | £839 | £889  |
| 486DX4/100MHZ AMD   | £749  | £799  | £819  | £889 | £919  |
| 486DX4/100MHZ INTEL | £759  | £809  | £829  | £899 | £929  |

### Multimedia Upgrade Options:

- 1. Sound Blaster Cracker Pack: £189**  
Sound Blaster 16 Card; Panasonic double speed CD Drive 563; Stereo speakers with Grolier Multimedia Encyclopedia; Aldus Photostyler.
- 2. Sound Blaster Discovery Pack: £219**  
Sound Blaster 16 Card; Panasonic double speed CD Drive 563; Stereo speakers with Grolier Multimedia Encyclopedia; Aldus Photostyler and 7 cd titles.
- 3. Sound Blaster Multimedia Office: £439**  
Sound Blaster 16 ASP Card; Panasonic double speed CD Drive 563; Headphones; with MS OFFICE PROFESSIONAL V4.3 and MS ENCARTA.

### 486DX 2/66 PCI

### 486DX 4/100 PCI

- 256K Cache memory
- Latest Phoenix BIO
- Upgradable to P24T ZIF socket
- 8MB Simm memory
- Western Digital IDE
- 1.44MB Floppy drive
- Built in enhance IDE & FDD
- 2 fast serial & parallel port
- 1MB Diamond stealth 64D
- Minitower & 200W PSU
- 14" Samsung monitor
- 102 key UK keyboard

### MULTIMEDIA PC

### PENTIUM 66 PCI

### PENTIUM 75 PCI

- 256K Cache memory
- Support flash BIOS
- 8MB Simm memory
- Western Digital IDE enhance
- 1.44MB Floppy drive
- PCI enhance IDE
- 2 serial 1 parallel 1 game
- 2MB Diamond Stealth 64
- Minitower & 200W PSU
- 14" Samsung monitor
- 102 key UK keyboard
- Sound Blaster 16 card
- Dual speed CD drive
- Stereo Speakers

### MULTIMEDIA PC

### PENTIUM 90 PCI

### PENTIUM 100 PCI

- Intel Motherboard
- 256K Cache memory
- Support flash BIOS
- 8MB Simm memory
- Western Digital IDE
- 1.44MB Floppy drive
- Built in Enhance IDE controller
- 2 serial 1 parallel 1 game
- 2MB Diamond Stealth 64
- Minitower & 200W PSU
- 15" Samsung monitor
- Cherry soft touch keyboard
- Sound Blaster & Speakers
- Quad speed CD Rom drive

### COMPUTER BUYER

### RECOM MARCH '95

### PENTIUM 90MHz PCI

- Intel motherboard
- 256K Cache memory
- Support flash BIOS
- 8MB Simm RAM
- Western Digital enhance IDE drive
- 1.44MB Floppy drive
- Built in enhance IDE & FDD
- 2 x fast serial & parallel port
- 2MB Diamond stealth 64 VRAM
- Minitower & 200W PSU
- 15" Samsung 15GL monitor
- Cherry soft touch keyboard
- Microsoft mouse v2
- DOS 6.22 & WIN 5.11

|                    |                     |                     |             |
|--------------------|---------------------|---------------------|-------------|
| 420MB £919 / £979  | 420MB £1249 / £1299 | 420MB £1599 / £1899 | 420MB £1549 |
| 730MB £969 / £1029 | 730MB £1299 / £1349 | 730MB £1649 / £1949 | 730MB £1599 |
| 850MB £989 / £1049 | 850MB £1319 / £1369 | 850MB £1699 / £1969 | 850MB £1069 |
| 1GB £1059 / £1119  | 1GB £1389 / £1439   | 1GB £1739 / £2039   | 1GB £1679   |

Warranty: All ESL systems are covered by 3 year Return to Base warranty; First year includes parts & labour; second and third years free labour. Optional on-site warranty available @ £35. 14 days money back guarantee. Free lifetime telephone support.



## MOTHERBOARDS

|   |         |
|---|---------|
| <b>ISA MOTHERBOARDS</b>   |         |
| 386SX 40MHz   | £49     |
| <b>VESA LOCAL BUS MOTHERBOARD</b>   |         |
| <b>AMI WIN BIOS with password: UMC/SIS/OPTI CHIPSETS; 3 VESA LOCAL BUS slots + 3x16 bit &amp; 1x8 bit slots; CPU upgradeable; Max. 64MB SIMM on board; Standard half size 8.5x9.8" Green Function</b> |         |
| ZIF Socket, 8 x 30pin or 4 x 30pin + 2 x 72pin SIMM Sockets; 3.5V DX4 compatible  |         |
| 486SX/33MHz 256K Cache INTEL  | £109    |
| 486SX/50MHz 256K Cache INTEL  | £119    |
| 486DX/50MHz 256K Cache INTEL  | £249    |
| 486DX/66MHz 256K Cache INTEL  | £179    |
| 486DX/100MHz 256K Cache INTEL   | £239    |
| 486DX/66MHz 256K Cache AMD  | £159    |
| 486DX/80MHz 256K Cache AMD  | £169    |
| 486DX/100MHz 256K Cache AMD   | £229    |
| <b>PCI MOTHERBOARD</b>  |         |
| <b>Phoenix BIOS 3 x PCI + 4 x ISA slots; 4 x 72 pin SIMM socket built in PCI enhance IDE</b>  |         |
| 486DX/66 256K Cache INTEL   | £189    |
| 486DX/100 256K Cache INTEL  | £249    |
| 486DX/66 256K Cache AMD   | £169    |
| 486DX/100 256K Cache AMD  | £239    |
| Options + Built in enhance IDE + FDD controller; Built in serial ports and parallel port  | add £29 |
| <b>PENTIUM PCI MOTHERBOARD</b>  |         |
| <b>Intel chipset; Intel Pentium 3 x PCI + 5x16bit slots built in enhance IDE &amp; FDD controller; 2 fast serial; 1 x parallel ports</b>  |         |
| Pentium 66MHz 256K  | £389    |
| Pentium 75MHz 256K  | £419    |
| Pentium 90MHz 256K  | £379    |
| Pentium 100MHz 256K   | £399    |
| <b>PENTIUM VLB + ISA + PCI MOTHERBOARD</b>  |         |
| Pentium 66MHz 256K  | £329    |
| Pentium 75MHz 256K  | £359    |
| Pentium 90MHz 256K  | £499    |

|   |      |
|---|------|
| <b>MOTHERBOARDS WITHOUT CPU</b>                               |      |
| VLB 486DX 256KB Cache 3 Vesa slots; 4x30 & 2x72 pin Simms     | £69  |
| VLB 486DX 256KB Cache 3 Vesa slots; 8x30 & 2x72 pin Simms     | £79  |
| PCI 486DX 256KB Cache   | £79  |
| PCI 486DX 256KB Cache with EIDE & FDD, fast serial & parallel | £99  |
| EISA 486DX 256K Cache   | £229 |

|                               |      |
|-------------------------------|------|
| <b>CPU</b>                    |      |
| INTEL SX33                    | £54  |
| INTEL SX2/30                  | £49  |
| INTEL DX2/66                  | £119 |
| INTEL DX50                    | £179 |
| INTEL DX4/100                 | £169 |
| AMD DX2/66                    | £119 |
| AMD DX4/100                   | £139 |
| Heat Sink and Fan for 486     | £8   |
| Heat Sink and Fan for Pentium | £15  |

## MEMORY MODULE

|                            |             |             |
|----------------------------|-------------|-------------|
| Simms 1MBx9 70ns (3 chips) | £29         | 60ns £32    |
| Simms 4MBx9 70ns           | £99         | 60ns £119   |
| Simms 4MB 72 pin           | 32 bit £109 | 36 bit £119 |
| Simms 8MB 72pin            | 32 bit £209 | 36 bit £229 |
| Simms 16MB 72pin           | 32 bit £319 | 36 bit £339 |
| Simms 32MB 72pin           | 32 bit £499 | 36 bit £529 |

## FLOPPY DRIVES

|   |     |
|---|-----|
| 1.44MB 3.5" Mitsubishi Floppy Drive           | £23 |
| 1.2MB 5.25" Panasonic/Mitsumi Floppy Drive    | £36 |
| 5.25" & 3.5" Canon/TEAC Dual Floppy Drive     | £95 |
| 3.5" to 5.25" adaptor Frame & Power connector | £5  |
| DISKETTES 3.5" HD/DS PREFORMAT BOX OF 50      | £20 |
| Floppy Cable 5 heads                          | £4  |

## HARD DRIVES

|  |       |
|--|-------|
| <b>Western Digital Caviar Series 3.5" IDE 3 Year Manufacturer Warranty</b> |       |
| <b>All Caviar series are Enhance IDE Drives</b>                            |       |
| 420MB AC240 12ms 128K Cache  | £129  |
| 540MB AC250 11ms 128K Cache  | £139  |
| 730MB AC270 10ms 128K Cache  | £179  |
| 850MB 10ms AC280 128K Cache  | £199  |
| 1GB AC3100 10ms 128K Cache   | £269  |
| 1.2GB AC3200 10ms 128K Cache   | £299  |
| <b>Seagate 3.5" IDE 3 Year Manufacturer Warranty</b>                       |       |
| 428MB ST3491A 14ms 128K Cache  | £119  |
| 540MB ST3600A 12ms 256K Cache  | £149  |
| 720MB ST 3780A 12ms 256K Cache   | £199  |
| 1GB ST31200A 12ms 256K Cache   | £299  |
| <b>Quantum 3.5" IDE</b>  |       |
| 540MB MV 540AT 13ms 128K Cache   | £139  |
| 730MB LT 730AT 11ms 128K Cache   | £189  |
| <b>Microplus 3.5" fast SCSI II 5 Year Manufacturer Warranty</b>            |       |
| 2GB M4221 8.5ms 512K Cache   | £239  |
| 4GB M4243 8.5ms 512K Cache   | £1199 |
| 9GB M1991 12ms 512K Cache  | £1899 |
| <b> Fujitsu 3.5" fast SCSI II 2 Year Manufacturer Warranty</b>             |       |
| 520MB M26843 12ms 256K Cache   | £169  |
| 1GB M16065 10ms 512K Cache   | £369  |
| 2GB M20035 10ms 512K Cache   | £759  |
| 2GB M29155 10ms 512K Cache   | £799  |
| 3GB M29095 10ms 512K Cache   | £969  |
| <b>Adaptors &amp; Cables</b>   |       |
| 5.25" HDD Adaptor  | £4    |
| IDE Cable 3 Heads  | £4    |
| SCSI Cable 3 Heads   | £5    |
| SCSI Cable external 50-50  | £15   |
| Removable Hard Drive Rack  | £19   |
| External Box for 1xSCSI drive  | £79   |
| External Box for 2xSCSI drive  | £99   |

## CONTROLLER CARDS

|  |      |
|--|------|
| I/O Card with 2 serial, 1 parallel, 1 game port                | £10  |
| IDE Card central 2 HDD 2 FDD with 25/19/1G ports & cables      | £15  |
| Enhance VLB IDE 2FDD 2HDD with 25/19/1G ports & cables         | £19  |
| Enhance VLB IDE 2FDD 2HDD with fast serial 16550 & cables      | £49  |
| PCI IDE + FDD Controller with fast serial ports                | £49  |
| Promise DC4030 VESA Local bus IDE Cache controller             | £95  |
| Promise DC420V VESA Local bus IDE Cache controller: 512K       | £85  |
| <b>CONTROLLER CARDS</b>  |      |
| Adaptec 1542B Boardware  | £119 |
| Adaptec 1542C ISA SCSI HDD & FDD Controller kit with software  | £169 |
| Adaptec 2742C EISA SCSI HDD & FDD Controller kit with software | £299 |
| Adaptec 2842C VLB SCSI HDD & FDD Controller kit with software  | £229 |
| Adaptec 2940 PCI SCSI HDD & FDD controller kit with software   | £229 |
| Future Domain PCI  | £129 |
| Card SCSI software   | £65  |

## DISPLAY CARDS

|  |      |
|--|------|
| Trident 9000B Chip with 256KB            | £22  |
| Trident 9000 Chip with 512KB             | £29  |
| Trident 89000 Chip with 1MB              | £47  |
| Tsang Lab ET4000 1MB 16.7 million colour | £69  |
| <b>VESA LOCAL BUS DISPLAY CARDS</b>      |      |
| All support 16 million true colours      |      |
| Cirrus Logic 5429 1MB                    | £59  |
| Cirrus Logic 5429 2MB                    | £99  |
| Diamond Stealth 640 S3 1MB DRAM          | £99  |
| Diamond Stealth 640 S3 2MB DRAM          | £139 |
| Diamond Stealth 640 Vedio 2MB VRAM       | £249 |
| Diamond Stealth 640 Vedio 4MB VRAM       | £239 |
| MPEG daughter board for Diamond          | £189 |
| Hercules Dynamite Pro ET4000/V32i 1MB    | £139 |
| Hercules Dynamite Pro ET4000/V32i 2MB    | £199 |
| Hercules Graphite Pro S3 1MB VRAM        | £179 |
| Hercules Graphite Power S3 2MB VRAM      | £279 |
| Hercules Graphite Terminator 64 2MB VRAM | £279 |
| Hercules Graphite Terminator 64 4MB VRAM | £429 |
| MATROX MGA Ultima Plus 2MB VRAM          | £289 |
| <b>PCI Graphic Accelerator</b>           |      |
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| Diamond Stealth 640 2MB DRAM             | £139 |
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| Hercules Dynamite Power 2MB VRAM         | £209 |
| Hercules Graphite Terminator 64 2MB VRAM | £279 |
| Hercules Graphite Terminator 64 4MB VRAM | £429 |
| MATROX MGA Impression plus 2MB VRAM      | £259 |
| MATROX MGA Impression plus 4MB VRAM      | £459 |
| Cirrus Logic 5434 1MB DRAM               | £99  |
| MATROX MGA Impression plus 2MB VRAM DAC  | £329 |

## MONITORS

|  |       |
|--|-------|
| 14" Mono VGA monitor   | £79   |
| <b>Samsung Syncmaster with 1 Year or 2 Year on-site maintenance</b>                    |       |
| <b>Low radiation MPRI; Green function Display Power Management Signalling</b>          |       |
| 14" Syncmaster 3 N 800 x 600   | £169  |
| 14" Syncmaster 14G N 1024 x 768  | £219  |
| 15" Syncmaster 15G N 1024 x 768  | £249  |
| 17" Syncmaster 17G N 1280 x 1024   | £319  |
| 17" Syncmaster 17G15 N 1280 x 1024 76Hz  | £549  |
| <b>Index Monitor with 3 year return to Manufacturers warranty &amp; on-site option</b> |       |
| 15" Vision Master MF8115 0.28mm 30.65Hz 1 year warranty                                | £259  |
| 17" Vision Master MF817A 0.28mm 23.5-84KHz   | £529  |
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| 21" Vision Master MF821 0.28mm 24.8-85KHz  | £1645 |
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| <b>Philips with 1 Year on-site warranty</b>  |       |
| 14" 14C 800x600 N.I.   | £179  |
| 14" 14A 1024x768 N.I.  | £219  |
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| 17" 17A 1280x1024 N.I.   | £689  |
| <b>Sony with 1 Year return to base warranty</b>  |       |
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| 17" 173S Trinitron (New)   | £849  |
| 20" 30SE Trinitron   | £140  |
| Anti Glare Screen Filter for 14"   | £22   |
| Monitor extension cable  | £10   |
| Monitor splitter cable   | £18   |

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|--|-------------|
| Sound Blaster Multimedia Kit includes SB16; CD ROM Drive; speakers; 2 CD     | £179        |
| Sound Blaster Discovery pack includes SB16; CD ROM Drive; speakers; 9CD      | £209        |
| Sound Blaster Multimedia Office includes SB16 ASP, CD ROM Drive; Headphones; |             |
| MS Office Professional; Encarta Encyclopedia                                 | £429        |
| Sound Blaster 16 value   | £65         |
| Sound Blaster 16 AWE 32  | £169        |
| Vedio Blaster  | £269        |
| Orchid Sounder Producer Pro  | £69         |
| Orchid Sound Wave 32 with speaker  | £135        |
| Gravis Ultrasound  | £99         |
| Stereo speakers 4W/15W/70W   | £15/£29/£59 |
| Microsoft Entice 95  | £35         |

## CD-ROM DRIVES

|  |      |
|--|------|
| Panasonic CR562B dual speed with cables    | £89  |
| Creative Lab CM563 double speed            | £89  |
| Sony CDUSSE Double Speed IDE               | £89  |
| Mitsumi FX400D quad speed with cables IDE  | £135 |
| Toshiba XM5302B quad speed with cables IDE | £199 |
| NEC quad speed with cables IDE             | £159 |
| Toshiba XM5201B 3.5 speed internal SCSI    | £159 |
| Toshiba XM5301B quad speed internal SCSI   | £249 |
| NEC 486 quad speed internal SCSI           | £269 |
| Pioneer DRU104M quad speed internal SCSI   | £179 |
| Pioneer DB6660M quad speed Jukebox SCSI    | £799 |
| Nakamichi M8R-7 CD Changer                 | £299 |

## FAX/MODEM

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|--|------|
| Fax/Modem card 9600/2400 with Quicklink                        | £39  |
| Fax/Modem card 14400/14400 with Bitset/Bicom                   | £69  |
| Fax/Modem card 14400/14400 with Winfax & DOS fax file BABT app | £99  |
| US Robotics Sporter 14.4 + Fax Ext                             | £129 |
| US Robotics Sporter 14.4 + Fax Ext                             | £129 |
| US Robotics Sporter 28800 + Fax Ext                            | £239 |
| US Robotics Courier V34 + Fax Ext                              | £329 |
| US Robotics Winmodem 14.4 Packet                               | £169 |
| Voice Fax modem 14400 with Bit Fax Pro                         | £99  |
| Modem cable 9-25 pin or 25-25 pin                              | £9   |

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|---------------------------------------|-----------|
| Colorado Jumbo D1-20 250MB internal   | £99       |
| Colorado Jumbo Tracker 250MB external | £209      |
| Colorado Jumbo 700MB Internal         | £229      |
| Imagex 250MB internal                 | £119      |
| Tape CD 2120                          | £12       |
| For jetters 2000 2GB Int/Ext          | £679/£779 |
| HP jetters 5000 2GB to 8GB Int/Ext    | £769/£869 |
| HP jetters 6000 4GB to 16GB Int/Ext   | £899/£999 |
| Time Ann DAT                          | £12       |



## PS & POWER SUPPLY UNITS

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|---|-------------|
| Desktop & 200W PSU 2X5.25" 2X3.5"                       | £39         |
| Desktop & 200W PSU 3x5.25" 1x3.5"                       | £49         |
| Slimline & 230W PSU 2x5.25" 2x3.5"                      | £55         |
| Mini tower & 200W PSU 2x5.25" 2x3.5" 1x3.5"             | £39         |
| Deluxe Mini tower & 200W PSU 2x5.25" 2x3.5" 1x3.5"      | £49         |
| Mini tower & 200W PSU 2x5.25" 2x3.5" 1x3.5" with door   | £49         |
| Mini tower & 200W PSU 2x5.25" 2x3.5" 1x3.5" with door   | £65         |
| Mini tower & 230W PSU 3x5.25" 3x3.5" 2x3.5" with door   | £75         |
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|--|-----|
| 102 key enhance click keyboard             | £18 |
| 102 key enhance soft touch keyboard        | £15 |
| Fujitsu 102 key enhance ergonomic keyboard | £30 |
| Cherry 102 key enhance membrane soft touch | £25 |
| Microsoft natural keyboard                 | £64 |
| Keyboard adaptor AT to PS/2 or PS/2 to AT  | £5  |

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|---|-----|
| 3 button mouse Microsoft compatible         | £8  |
| 3 button mouse with mat MS compatible       | £10 |
| Logitech Pilot Mouse 3 button MS compatible | £19 |
| Microsoft Mouse 2 button serial             | £29 |
| Trackball                                   | £18 |
| Handy Trackball for portable                | £24 |
| Logitech Trackman combo PC version          | £59 |
| Warrior 5 joystick (analog PC joystick)     | £8  |
| AVIATOR 5 joystick (analog PC joystick)     | £21 |

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|                                      |      |
|--------------------------------------|------|
| Epson GTX = 6500P parallel 600 dpi   | £469 |
| Epson GTR = 8000S SCSI 800 dpi       | £799 |
| Logitech Scanman 256                 | £109 |
| Logitech Scanman model Colour 24 bit | £219 |
| Logitech EasyTouch Scanner           | £129 |
| HP Scanjet IIP AT                    | £349 |
| HP Scanjet IIC X                     | £699 |

## SOFTWARE

|                                      |      |
|--------------------------------------|------|
| Microsoft DOS 6.2                    | £39  |
| Microsoft Windows 3.11               | £45  |
| Microsoft DOS 6.2 & MS WINDOWS 3.11  | £79  |
| Microsoft DOS 6.2 Upgrade            | £45  |
| MS Office V4.2 win                   | £345 |
| MS Office V4.3 PRO win               | £399 |
| MS Works win                         | £69  |
| Word Perfect 6.0 for win             | £219 |
| Lotus Smart Suite v3 for Win         | £329 |
| Lotus Smart Suite v3 for Win Upgrade | £229 |

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| NE2000 compatible Novell approved       | £29                             |
| Longshine BNC/10 Base T                 | £39                             |
| Longshine packet lan adaptor            | £79                             |
| 3 COM 3C509                             | £69                             |
| 3 COM 3C509 COMBO                       | £99                             |
| 3 COM 3C589 PCMCIA                      | £149                            |
| SMC Elite Ultra 16                      | £69                             |
| SMC Elite Ultra 16C Combo               | £85                             |
| D Link DE600D Packet Lan adaptor BNC    | £125                            |
| Real Run for NE2000                     | £5                              |
| Terminator                              | £2                              |
| T-piece                                 | £2                              |
| Ethernet Cables                         | 3M £6; 6M £9; 10M £12; 20M £20  |
| Over 20 metre £1 per metre              |                                 |
| RJ 45 cable                             | 3M £9; 6M £12; 10M £17; 20M £25 |
| Novell Personal Network for DOS and Win | £49                             |
| Netware 3.12, Netware 4.0               | Call                            |
| HUBS 8 RJ45 + 1BNC                      | £169                            |
| HUBS Stackable 12 RJ45 + 1BNC + 1AUI    | £289                            |

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| <b>HEWLETT PACKARD</b>                          |       |
| Deskjet 320 portable                            | £149  |
| Deskjet 520 mono                                | £199  |
| Deskjet 560 Colour                              | £339  |
| Deskjet 1200C colour                            | £699  |
| Deskjet 1200C colour postscript                 | £999  |
| Laserjet 4L 300dpi; 4ppm; 1MB                   | £399  |
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| Laserjet 4P 600dpi; 4ppm; 2MB                   | £619  |
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| Laserjet 4 plus 600dpi; 12ppm; 2MB              | £949  |
| Laserjet 4M plus postscript; 600dpi; 12ppm; 6MB | £1269 |
| <b>CANON</b>                                    |       |
| BJ200   | £189  |
| BJ300   | £379  |
| BJ330   | £429  |
| BJ600C  | £419  |
| BJC 4000  | £299  |
| BJC 800 (A3)                                    | £1099 |
| <b>EPSON</b>                                    |       |
| LQ-100 9 pin; 240 cps                           | £99   |
| LQ-100 24 pin; 200 cps                          | £109  |
| STYLUS 400 INKJET                               | £139  |
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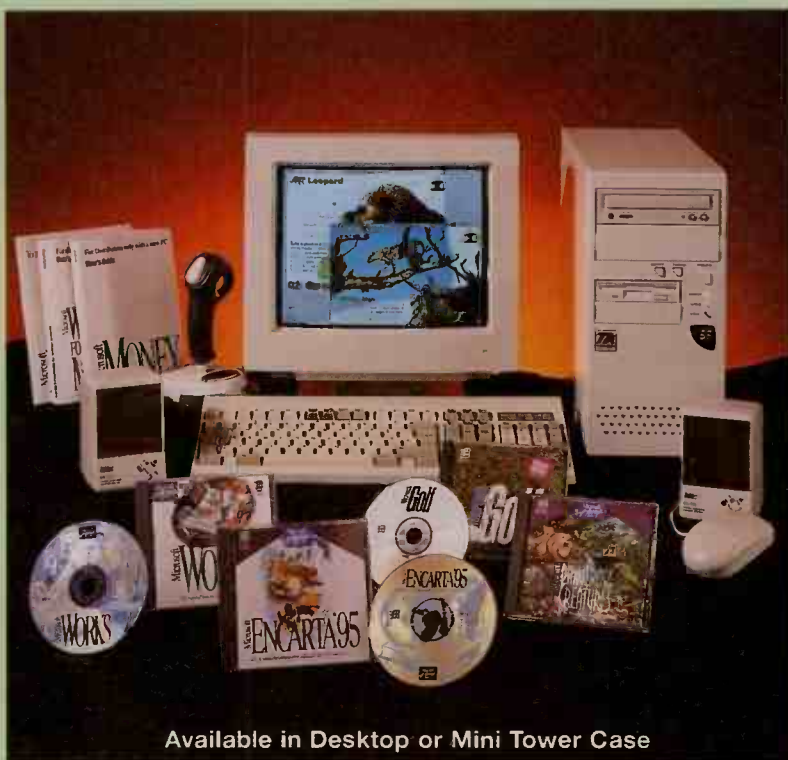
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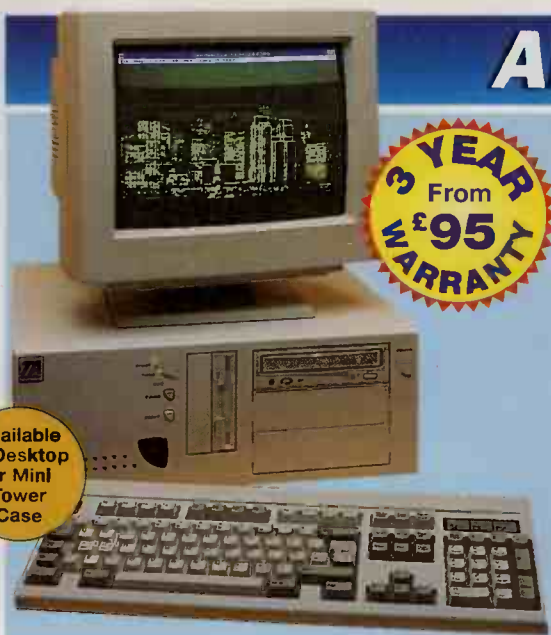
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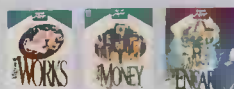
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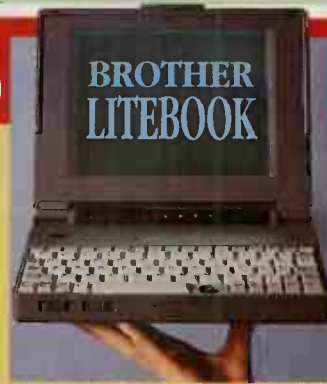
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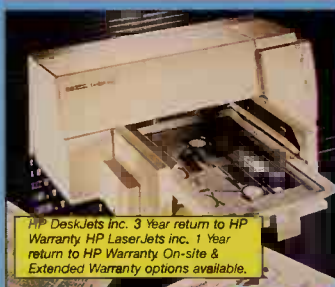


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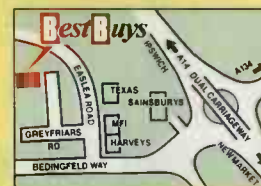
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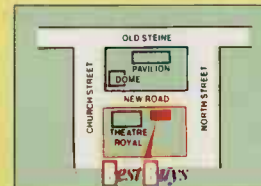
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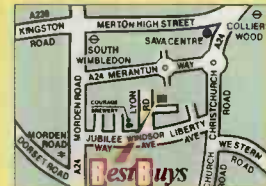
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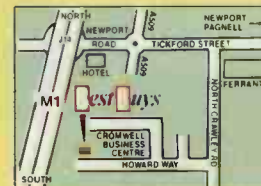
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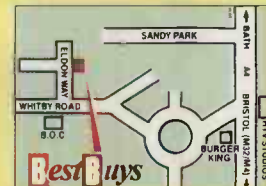
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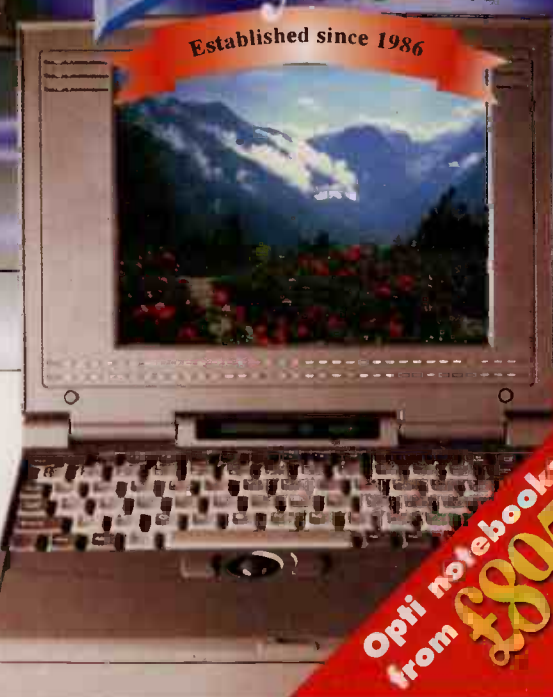
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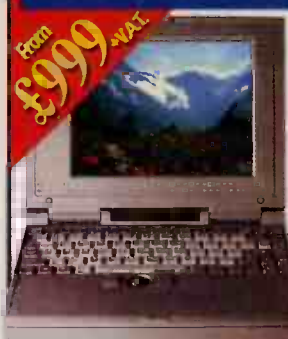
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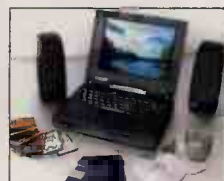
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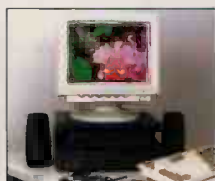
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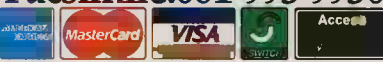
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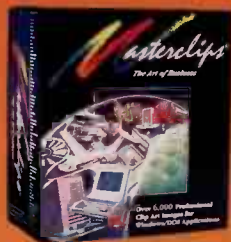


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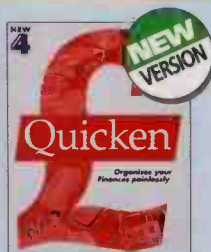
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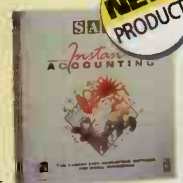


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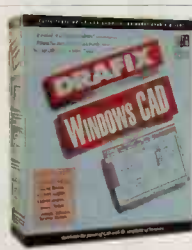
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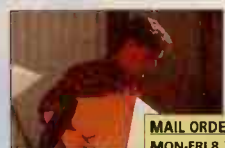




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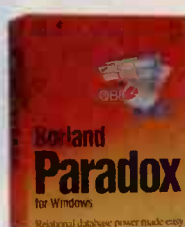


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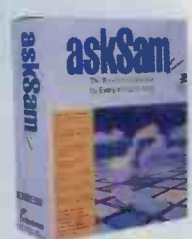


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FileMaker Pro is established as one of the easiest-to-use relational Windows databases. In this new version, Claris have added many hot new features and six full-blown pre-designed applications for you to use or modify in just about any database application. Order before June 30th and get a FREE Claris T-shirt and a 100 template CD on registering your copy.



CAL002 FileMaker Pro .....**£86<sup>90</sup>**

## DEVELOPMENT & LANGUAGES

### Borland C++ V4.5

The World Standard C and C++

Only Borland C++ 4.5 gives you everything you need to visually create high performance ANSI C and C++ compatible applications for DOS, Windows and Win32 from a single environment. New OLE 2.0 FastTrack turns your Windows applications into a first class suite member. Borland C++ 4.5 comes with a free upgrade path to Windows 95 when available. Ranked No.1 by developers worldwide.

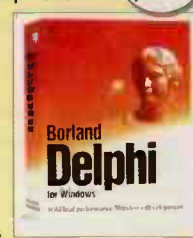


BOR010 Borland C++ 4.5 on CD.....**£129<sup>25</sup>**

### Delphi

The next generation Windows development tool

Delphi is the next generation development tool, combining the RADical performance of an optimising compiler with a visual design environment and integrated database access. delphi compiles Windows applications that are faster and more robust than interpreted code. Delphi includes a suite of graphic tools, ReportSmith and the InterBase local server.



DEL006 Delphi.....**£189<sup>90</sup>**

|        |  |      |
|--------|--|------|
| OB002  | WIN ObjectVision v2.1.....                 | £68  |
| BOR010 | CD Borland C++ v4.5 C/U.....               | £129 |
| BOR011 | CD Borland C++ v4.5 U/G.....               | £95  |
| BOR098 | CD C++ v4.5 + Database. Tools C/U.....     | £199 |
| BOR099 | CD C++ v4.5 + Database. Tools V/U.....     | £159 |
| BOR018 | WIN Borland C++ Visual Solutions.....      | £65  |
| TUR013 | WIN Borland Turbo C++ Visual Ed. v3.1..... | £65  |
| TUR005 | DOS Borland Turbo C++ v3.....              | £48  |
| TUR003 | WIN Borland Turbo Pascal v1.5.....         | £78  |
| TUR008 | DOS Borland Turbo Pascal v7.....           | £68  |
| MIC146 | DOS MS Macro Assembler v6.11.....          | £89  |
| COB001 | DOS MS Cobol PDS v5.....                   | £389 |
| QUI006 | WIN MS Quick C.....                        | £89  |
| QUI001 | DOS MS Quick C.....                        | £49  |
| VIS002 | WIN MS Visual Basic v3 Std.....            | £78  |
| VIS004 | WIN MS Visual Basic v3 Prof.....           | £193 |
| VIS001 | DOS MS Visual Basic v1 Std.....            | £79  |
| VIS003 | DOS MS Visual Basic v1 Prof.....           | £196 |
| VIS009 | WIN MS Visual C++ Std.....                 | £57  |
| VIS005 | WIN MS Visual C++ Prof.....                | £194 |
| MIC222 | CD MS Visual C++ Prof v2 NEW.....          | £259 |
| VIS031 | WIN MS Visual C++ 32-Bit.....              | £259 |
| SYM004 | WIN Symantec C++ Std.....                  | £79  |
| SYM005 | WIN Symantec C++ Prof.....                 | £169 |

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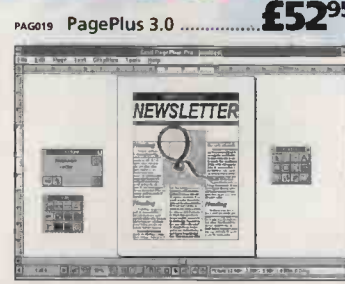


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TypePlus - create special text effects  
PhotoPlus - is Serif's award-winning imaging software  
DrawPlus - allows you to create vector drawings

|        |                                     |      |
|--------|-------------------------------------|------|
| PAG027 | WIN PagePlus Suite CD.....          | £79  |
| PAG020 | WIN PagePlus 3.0 Upgrade.....       | £19  |
| PAG021 | WIN PagePlus 3.0 Suite.....         | £79  |
| PAG022 | WIN PagePlus 3.0 Suite Upgrade..... | £49  |
| PAG024 | WIN PagePlus Type Plus v3.....      | £29  |
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A screenshot from PagePlus 3.0

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FormTool will generate reports to help you keep track of your business information. Pressed for time? Just modify one of the pre-designed form templates which come free with FormTool. You will improve your business image, increase your productivity and save money!

FOR018 FormTool Gold Win... **£49<sup>95</sup>**

### Toplevel Forms

Save time and money by designing, printing and filling-in forms on screen.



With Toplevel Forms you can even auto-fill forms from the built-in contact database. Accounts forms, job applications, sales order forms, servicing, warranty claims, time/expense recording, job costing, quality control, and B55750 activities are just a few uses of this super package. It also includes form design, form fill and contact database.

TOP003 Toplevel Forms..... **£69<sup>80</sup>**

### Labels Unlimited

The easiest way to label anything.



Whether you're creating labels for addresses, file folders, audio/visual, or inventory stickers, Labels Unlimited has the label format that you need. Choose from over 80 A4 size labels for Avery, TENZA, Stampit and others. Alternatively, you can custom design any format of your own. With convenient thumbnail previews to help you select the right label, no other program makes it easier!

LAB003 Labels Unlimited..... **£26<sup>95</sup>**  
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## GRAPHICS

### Family Tree Maker

Trace your family tree history.

Family Tree Maker is quick and easy to use. Just enter information about parents, children and marriages to create a great looking Family Tree in minutes. Record birth dates, occupation, medical history, and any other information you wish to print. You can even record favourite family stories and can save up to 15 pages per person. You can automatically create ancestor, descendant and photo trees, or view your tree in one of the many different styles available.

FAM001 Family Tree Maker..... **£39<sup>75</sup>**

### Corel PhotoPaint 5

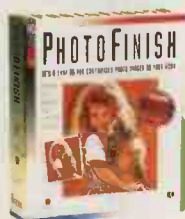
The best in photo-editing and bitmap creation

Corel PhotoPaint 5 Plus includes all the tools you will need to paint, edit and retouch your images. Features dynamic special effects, such as mesh, warp, swirl, pinch and 3D perspectives and the ability to import or scan photos. As with all Corel products it includes a whole host of goodies including: 1000 photographs, 10,000 clip art images, 100 TrueType and Type1 fonts, 50 image enhancement features, 300 seamless tiles, 50 custom brushes, 40 canvases and 40 artist brush styles.

COR054 Corel PhotoPaint 5 Plus CD..... **£59<sup>60</sup>**

### PhotoFinish Version 3

Produce and edit photographic quality images.



Scan, crop, straighten and enhance images all in one easy step. It also features automatic retouching filters (adjust brightness, contrast, hue and saturation, remove spots and moire patterns). Automatic effects let you emboss, detect edges, diffuse, twist, pixelate, crystallise, add motion blur, etc. Includes PhotoLibrary Vol. 1 and ImageViewer.

PHO001 PhotoFinish..... **£33<sup>95</sup>**



### Corel Draw!

CorelDRAW offers ease-of-use, incredible value and outstanding features

CorelDRAW 3: The perfect entry-level graphics package inc. Corel PhotoPaint, Corel Chart, Corel Show, Corel Trace. 250 fonts and 14,000 clipart images. CorelDRAW 4: All the above with the addition of new Corel Move (for animation) and OCR. Also 750 fonts and 18,000 clipart. CorelDRAW 5: All the above plus a fully integrated copy of the DTP package Corel Ventura 5. 825 fonts and 22,000 clipart. SEE FULL LIST OFF COREL PRODUCT ON NEXT PAGE!

### The Ultimate Image Bundle - ONLY £29<sup>99</sup>



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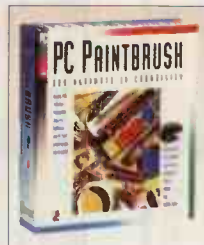
- MasterClips 3000 - 3000 professional vector clip art images RRP. £79.00
- Corel ArtShow 3 - 3000 graphical Images, Inc. paintings, drawing etc. RRP. £39.00
- KeyFonts Plus - 1250 fully scaleable TrueType fonts for Windows RRP. £42.00
- SoftKey Photos - 2100 royalty-free stock photos from the world's top photographers RRP. £39.00

Offers may be subject to promotional packaging, however all are full, latest versions of the software.

### PC Paintbrush

The popular drawing and painting package that allows you to simulate natural painting techniques

PC Paintbrush is a fully featured drawing program that lets you export your artwork to most popular Windows programs. It also allows users to simulate natural painting techniques without being a professional artist, and lets users become instantly productive via its easy-to-use interface.



PAI001 PC Paintbrush..... **£26<sup>95</sup>**

## 3D GRAPHICS SOFTWARE

### TrueSpace

Computer Shopper's Editor's Choice for 'Best Software Product of the Year'

If you are a graphic artist, designer, multimedia author or video professional using Windows, you need Caligari TrueSpace. With TrueSpace you can produce photorealistic images, beautiful enough for the cover of Time magazine or video animations, professional enough for the evening news, however it is easy for anyone to get effective results.

TRU003 TrueSpace by Caligari..... **£389<sup>45</sup>**

### Visual Reality

The complete set of professional tools for 3D graphics and multimedia

Visual Reality Includes 'Renderize Live', an award-winning rendering and camera animation tool. Create three dimensional wire frame models in an easy and intuitive environment. Also Includes 'Visual Image', a powerful object-based image editing and processing tool, over 500 3D clip art images and the ability to playback animations in FLI, FLC or AVI formats.

VIS037 Visual Reality..... **£239<sup>50</sup>**

### 3D F/X

Create high quality professionally rendered three-D images and animations with Asymetrix 3D F/X

Build dynamic 3D scenes quickly with a catalogue of models, surfaces, animation paths and more! Create and modify scenes easily using Windows standard 'drag-and-drop'. With full Microsoft Office and OLE 2.0 compatibility you can embed 3D F/X graphics into existing Windows applications. Export via AVI, BMP and TGA file formats. Spin and fly logos and models in and out of scenes using pre-set or custom animation paths.

3DF001 3D F/X..... **£99<sup>45</sup>**

### Simply 3D

A complete set of multimedia 3D graphic tools - let your imagination go wild with this powerful new package from Visual Software

This simple to use 3D graphics package is all you'll ever need to create stunning presentations and amazing graphics. Comes with 70 seamless textures, over 100 3D objects, 3 animation players and a comprehensive step-by-step tutorial.

SIM008 Simply 3D 1.0..... **£59<sup>50</sup>**



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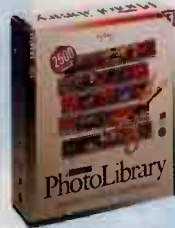
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### Photo Library

An outstanding double CD collection of 2500 images.

A wide range of photo images in both TIFF and BMP formats. All Images are royalty free, 24-bit colour photos.

It also includes Power Library, a powerful picture organiser which builds up an album of all pictures, allowing the user to easily view and browse Images before using them. It's an unbeatable resource for anyone who works with Photoshop, PhotoFinish and CorelDraw.



PH003 Photo Library.....**£28<sup>95</sup>**

### CorelFLOW

Create flowcharts, diagrams, schematics, charts & more.

CorelFLOW can create quick and powerful diagrams, flow charts, organisational charts, and even your own clipart with the ease of drag and drop. Choose symbols from over 90 pre-defined symbols libraries. Incredible value with over 2000 symbols, 1000 clip art, 1000 photos (on CD), 100 TrueType fonts. CorelFLOW has all the features you need!



COR034 Corel Flow.....**£47<sup>10</sup>**

### Corel Gallery

An easy-to-use, visual clipart manager, featuring 10,000 clipart images, on CD-ROM.

CorelGALLERY allows users to drag and drop Images into any OLE-2-enabled application or export images to several industry-standard file formats. It includes over 10,000 professionally designed clipart Images (including more than 6000 in colour), plus a full-colour reference guide.COR01



COR017 CorelGallery.....**£26<sup>95</sup>**



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we will beat  
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(Subject to terms on last page of advert.)

### PC Paintbrush Clip Art Library

The ultimate colour clipart collection.

Introducing PC Paintbrush Clip Art Library - the ultimate collection of 12000 hand drawn colour clipart masterpieces. These stunning royalty-free images are ready-to-use in any Windows application. PowerAlbum is bundled absolutely free to help you organise and work with any existing clipart/images you may already have.



CL007 ClipArt Library.....**£26<sup>95</sup>**

### Graphics: Clip Art & Fonts

|        |     |   |             |
|--------|-----|---|-------------|
| 125001 | WIN | 1250 Fonts on CD.....                           | <b>£19</b>  |
| ART001 | WIN | Arts and Letters Apprentice.....                | <b>£47</b>  |
| CL0008 | WIN | Click Art Studio Animals & Nature.....          | <b>£14</b>  |
| CL0009 | WIN | Click Art Studio Artistry & Borders.....        | <b>£14</b>  |
| CL0010 | WIN | Click Art Studio Business Art.....              | <b>£14</b>  |
| CL0011 | WIN | Click Art Studio Illustrations.....             | <b>£14</b>  |
| CL0012 | WIN | Click Art Studio Sport & Games.....             | <b>£14</b>  |
| CL0018 | WIN | Click Art Studio All 5 Titles.....              | <b>£39</b>  |
| CL0013 | WIN | Click Art Cartoons Beastly Funnies.....         | <b>£14</b>  |
| CL0014 | WIN | Click Art Cartoons Bulletins & Newsletters..... | <b>£14</b>  |
| CL0015 | WIN | Click Art Cartoons Company & Business.....      | <b>£14</b>  |
| CL0016 | WIN | Click Art Cartoons Parties & Events.....        | <b>£14</b>  |
| CL0017 | WIN | Click Art Cartoons On The Job.....              | <b>£14</b>  |
| HAR008 | WIN | Harvard Clip Art Collection CD.....             | <b>£29</b>  |
| HAR009 | WIN | Harvard Clip Art Cartoons.....                  | <b>£19</b>  |
| HAR017 | WIN | Harvard Clip Art Christmas.....                 | <b>£10</b>  |
| HAR010 | WIN | Harvard Clip Art Business.....                  | <b>£19</b>  |
| LOT000 | WIN | Lotus SmartPics for Freelance.....              | <b>£19</b>  |
| MAS001 | WIN | MasterClips 3.5".....                           | <b>£119</b> |
| MON003 | WIN | 50 PostScript MonoType Fonts.....               | <b>£14</b>  |

### Graphics: Design

|        |     |                                |             |
|--------|-----|--------------------------------|-------------|
| FI0004 | WIN | 1st Design.....                | <b>£29</b>  |
| A00008 | WIN | Adobe Illustrator.....         | <b>£389</b> |
| ALD004 | WIN | Aldus Freehand.....            | <b>£149</b> |
| ALD003 | WIN | Aldus IntellDraw.....          | <b>£99</b>  |
| ANI001 | WIN | Animation Works.....           | <b>£88</b>  |
| ART001 | WIN | Arts & Letters Apprentice..... | <b>£49</b>  |
| CRI001 | WIN | CA Cricket Graph.....          | <b>£49</b>  |
| COR002 | WIN | CorelDraw 3.....               | <b>£87</b>  |
| COR038 | WIN | CorelDraw 3.....               | <b>£49</b>  |
| COR003 | WIN | CorelDraw 4.....               | <b>£119</b> |
| COR012 | WIN | CorelDraw 4.....               | <b>£109</b> |
| COR018 | WIN | CorelDraw 5.....               | <b>£399</b> |
| COR030 | WIN | CorelDraw 5.....               | <b>£349</b> |
| COR019 | WIN | CorelDraw 3 to 5 Upgrade.....  | <b>£269</b> |
| COR019 | WIN | CorelDraw 3 to 5 Upgrade.....  | <b>£299</b> |
| COR032 | WIN | CorelDraw 4 to 5 Upgrade.....  | <b>£159</b> |
| COR033 | WIN | CorelDraw 4 to 5 Upgrade.....  | <b>£139</b> |
| DES009 | WIN | Designworks v2.....            | <b>£69</b>  |
| DRA003 | WIN | DrawPlus.....                  | <b>£25</b>  |

### Graphics: Labels & Forms

|        |     |  |             |
|--------|-----|--|-------------|
| CAL002 | WIN | Calendar Creator.....                    | <b>£29</b>  |
| LAB003 | WIN | Labels Unlimited.....                    | <b>£27</b>  |
| LAB001 | DOS | Labels Unlimited.....                    | <b>£29</b>  |
| FOR004 | DOS | Form Tool Gold.....                      | <b>£29</b>  |
| PER003 | WIN | Form Flow Designer.....                  | <b>£119</b> |
| PER004 | WIN | Form Flow Filler.....                    | <b>£75</b>  |
| PER005 | WIN | Form Flow Filler 10Pk.....               | <b>£499</b> |
| HAR016 | WIN | Harvard Chart XL.....                    | <b>£89</b>  |
| TOP003 | WIN | TopLevel Forms.....                      | <b>£69</b>  |
| WORD56 | WIN | WordPerfect Informs Design & Filler..... | <b>£259</b> |
| WORD57 | WIN | WordPerfect Informs Filler.....          | <b>£99</b>  |

### Graphics: Images / Editing

|        |     |                                 |             |
|--------|-----|---------------------------------|-------------|
| ADO006 | WIN | Adobe Photoshop.....            | <b>£469</b> |
| COR011 | WIN | Corel ArtShow v3 CD & Book..... | <b>£24</b>  |
| COR041 | WIN | Corel ArtShow v5 CD & Book..... | <b>£24</b>  |
| COR035 | WIN | Corel Photos People.....        | <b>£19</b>  |
| COR022 | WIN | Corel Photos Food.....          | <b>£19</b>  |
| COR027 | WIN | Corel Photos Auto Racing.....   | <b>£19</b>  |
| COR037 | WIN | Corel Photos Death Valley.....  | <b>£19</b>  |
| COR029 | WIN | Corel Photos Wild Animals.....  | <b>£19</b>  |
| MIC023 | WIN | Micrographix PhotoMagic.....    | <b>£69</b>  |
| MIT005 | WIN | Kodak Photo CD.....             | <b>£15</b>  |
| MOR004 | WIN | Morph.....                      | <b>£89</b>  |
| SPI001 | WIN | Power Album.....                | <b>£29</b>  |

### Graphics: Presentations

|        |     |                                |             |
|--------|-----|--------------------------------|-------------|
| AST001 | WIN | Astound.....                   | <b>£85</b>  |
| ALP003 | WIN | Alpha Bravo Presentations..... | <b>£45</b>  |
| ASY001 | WIN | Asymedia.....                  | <b>£93</b>  |
| HAR013 | WIN | Harvard Graphics v3 C/U.....   | <b>£129</b> |
| HAR000 | WIN | Harvard Presenters' Pack.....  | <b>£189</b> |
| HAR012 | WIN | Harvard Spotlight.....         | <b>£49</b>  |
| LOT005 | WIN | Lotus Freelance v2.01.....     | <b>£258</b> |
| LOT050 | WIN | Lotus Freelance LLP.....       | <b>£229</b> |
| LOT033 | WIN | Lotus Freelance C/U.....       | <b>£135</b> |
| LOT034 | WIN | Lotus Freelance U/G.....       | <b>£95</b>  |
| POW002 | WIN | MS PowerPoint v4.....          | <b>£225</b> |
| MIC155 | WIN | MS PowerPoint MLP.....         | <b>£199</b> |
| MIC156 | WIN | MS PowerPoint U/G CCP.....     | <b>£90</b>  |

### Visio Version 3

If you can move a mouse, you can draw with Visio. Just drag and connect pre-drawn stencils - Visio does the rest.

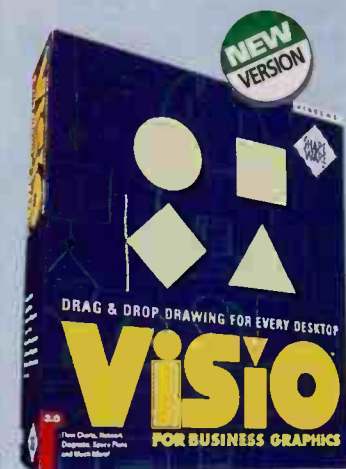
Visio is the drag and drop drawing tool for people who can't draw. The 22 job-specific stencils and 750 SmartShapes™ that come with Visio allow you to create a multitude of diagram types, from flowcharts and organisation charts to electrical diagrams, maps and office floor plans.

In addition to the SmartShapes™ included in Visio, you can select one or more of 15 Add-On SmartShape products for your own particular diagramming tasks or projects. Visio SmartShapes™ are more than static clip art or symbol libraries, because they anticipate how you'll use them and then behave in a useful way. SmartShapes™ resize without distorting, connecting lines stay glued and reroute automatically, and text goes where it should in a format that makes sense. There are more than 3,000 shapes to choose from. Simply add the shapes you need, when you need them!

VIS033 Visio 3.....**£87<sup>95</sup>**

### Extra Visio Shapes & Ideas

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|---|------------|
| Advanced Flowcharts.....                          | <b>£39</b> |
| More than 260 shapes for flowcharting             |            |
| Network Diagrams.....                             | <b>£39</b> |
| Design and model detailed data networks           |            |
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| Draw complex chemical structures & functions      |            |
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|   |            |
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| For creating detailed design documents            |            |
| Petroleum Engineering.....                        | <b>£39</b> |
| Covers all phases of petroleum based activities   |            |
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| Plan your dream home or your next remodel         |            |
| Kids.....   | <b>£39</b> |
| A wealth of fun illustrations & shapes for kids   |            |
| Landscape Planning.....                           | <b>£39</b> |
| Landscape your garden & create planting charts    |            |
| Visio Express for SmartSuite.....                 | <b>£39</b> |
| Adds Visio to SmartSuite Control center           |            |
| Visio Express for MS Office.....                  | <b>£39</b> |
| Adds Visio to Microsoft Office Control Panel      |            |

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### J.I.T. Corel Training

An exciting new approach to learning CorelDraw!

All of JIT's products are designed to run in a parallel window to CorelDraw or Corel PhotoPaint. In that way the learner is able to work right along with the instructions, using either the graphics provided on the CD, or directly within their own application. A complete set of 'VCR-type' controls to pause, repeat and skip forward or backward within the relevant training make this the easiest way to learn Corel Draw.

JIT CorelDraw 3,4 or 5 Training.....**£29<sup>95</sup>**

### EZ Internet for Windows

The easy way to access the Internet.

Why shift through heavy Internet reference manuals and hundreds of "how to" pages, when you can jump on the information highway with this easy-to-use Internet training package. EZ Internet includes multimedia tutorials to get you started with an intuitive Windows interface. Connect to Surfnr, Biznet, Boutique, Kidsnet and go shopping on the Internet.

EZ001 EZ Language for Windows.....**£29<sup>99</sup>**

### SpellWrite

Spell-check any Windows application with SpellWrite

Once installed, this clever utility works in the background of Windows and is accessed by highlighting a piece of text and then pressing a hot key. If your highlighted text contains a word that doesn't match any in the supplied English 85,000-word dictionary, up pops a dialog box. Here you can perform all the usual activities you'd expect from a good spell-checker. SpellWrite also adds a unique toolbar to the Write application that comes as part of Windows, giving access to common functions.

SP005 SpellWrite.....**£18<sup>50</sup>**

### Top 10 Selling Training Videos

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| VID013 | WIN | WordPerfect Beginners.....    | <b>£14</b> |
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| VID033 | WIN | Lotus Approach Beginners..... | <b>£14</b> |
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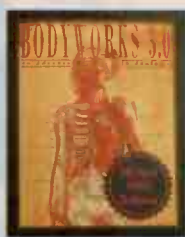


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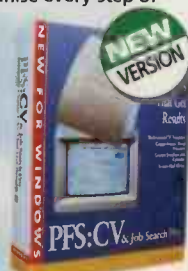
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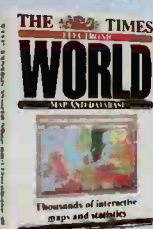


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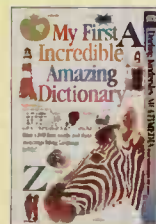
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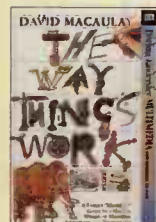


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| LOT043 | WIN Lotus Organizer 1.1 WSL    | £49  |
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OS/2 comes with a Bonus Pack of full 32-Bit applications which collectively retail at over £1000. IBM Works, a mini-suite of 32-Bit applications including word processing, spreadsheet, charting, datafile and report writing. IBM's Internet Connection Package, lets you seamlessly navigate through the Internet with easy-to-use graphical interfaces. IBM CompuServe Access software is also included. Fax Works, with this application you can fax documents from within your existing programs.

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### WinDelete

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If you're running out of hard disk space your computer's performance is likely to be suffering too. WinDelete is simply the best way to install and uninstall any Windows-based application, freeing up hard disk space and improving Windows' speed and efficiency. With colour coding of files, only those that you really want to be deleted are removed. When removing applications, WinDelete also tidies up the WIN.INI file.

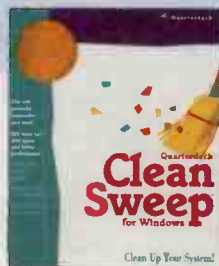


WIN050 WinDelete... **£29<sup>95</sup>**

### CleanSweep

Removes all unwanted or redundant files!

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**VIRUS GUARD** - This is the memory resident utility that is installed every time you restart your computer. It checks every program for viruses before it is opened or copied. A visual warning is displayed if there is any virus present.

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| WOR034 | DOS WordPerfect v6.1.....     | <b>£212</b> |
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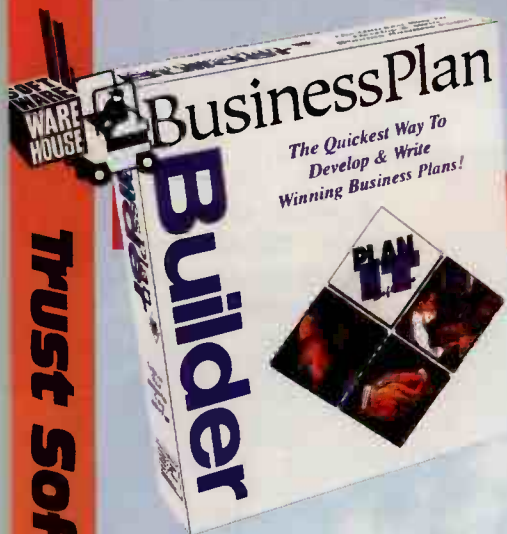
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## BUSINESS PLAN BUILDER

### Launch Special

# £89<sup>95</sup>

NEW PRODUCT

BusinessPlan Builder is the easy way to build professional business plans and more - or your money back!

### AND It's more than just a business plan builder!

- ✓ 70+ sources of UK grants and funds.
- ✓ Over 2,500 vital UK names and addresses.
- ✓ Sales and marketing forecasts and analysis.
- ✓ On-line business forum and database.
- ✓ 3 Year projected financial forecasts.

Writing business plans is a tedious and time consuming job at the best of times. BusinessPlan Builder has been designed to take users through the process of developing and writing effective business plans by providing the structure, automating repetitive tasks and providing all the information necessary to write a winning business plan.

### Are you starting a business?

If you've had a great business idea, BusinessPlan Builder will help you to explore its feasibility and project your Cash Flows, Profit & Loss, Break-even analyses, and much more. It can help to shape your idea into a winning business plan and present it to financiers, banks or partners. PLUS it includes all the forms required by Companies House to incorporate a company - saving you up to £100!

SAVE up to £100 When incorporating a business.

### BusinessPlan Builder

BusinessPlan Builder is an easy to use package that creates structured business plans for any size of company. It provides users with relevant questions and sample answers from which to create a business plan. It automatically formats it with headlines and subheads, even inserting your company details throughout. Simply answer the questions and fill in the blanks - Business Plan Builder does the rest!

You can preview your plan at any stage - BusinessPlan Builder files are compatible with practically all Windows Word Processor packages or you can print directly from within BusinessPlan Builder.

### Market Analysis

BusinessPlan Builder helps you identify opportunities and threats to your business through an in-depth analysis of your company, products, competition and industry.

### Sales and Marketing

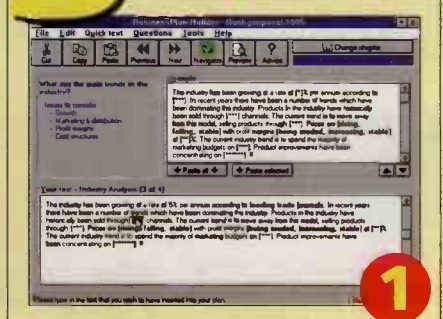
BusinessPlan Builder helps you to develop effective sales and marketing strategies and present them in a coherent manner, which both potential investors and employees will easily grasp. Business Plan Builder will provide the right marketing plan and information for you to cross check as your business starts to grow.

### On-Line Information

Much valuable time is wasted collecting and collating information when developing and writing business plans. BusinessPlan Builder has done this work for you, providing information in a number of ways, namely:

- On-Line Help & Advice
- Contact Database
- On-Line Business Forum

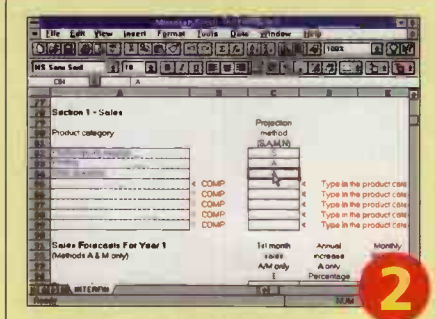
## 5 EASY STEPS TO PRODUCING EFFECTIVE BUSINESS PLANS



1

### BusinessPlan Builder

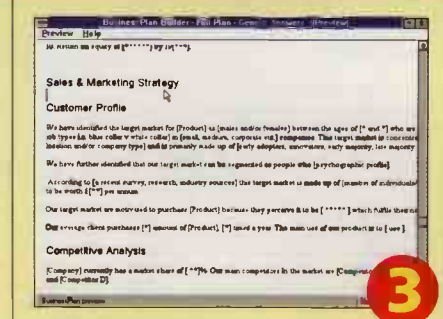
Provides relevant questions and sample answers from which to create a business plan. Automatically formats your business plan with headlines, subheadings, and company details. Plus, QuickText allows you to insert recurring phrases, names and dates.



2

### Projected Financials

Pre-structured financial templates are ready to use - simply type in your company income and expenditure details and BusinessPlan Builder will calculate totals, percentages and ratios, creating your projected financials for three years ahead.



3

### Print Preview

View your plan at any time in Print Preview mode. Your plan is automatically formatted with all the headers and sub-headers in place. You can print directly from BusinessPlan Builder or use your favourite Word Processing package.

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## CAPITALISE ON YOUR BUSINESS IDEAS!

### Trying to grow your business?

If you own your own business, you'll have had plenty of ideas for expanding and diversifying your company. BusinessPlan Builder will enable you to find out how your ideas will do in a real-life context. You can test out the options available to you to help you decide which areas to expand into, plus you can prepare professional reports and charts to help you explain your idea to others in your business.

Also included are over 70 sources of funding to help you get the backing to expand your business.

### Over 70 Sources of UK Funding

With over 70 sources and methods of gaining funding, BusinessPlan Builder is an invaluable source of information, advising you on how to effectively secure vital funds necessary for any successful business. Sources include venture capital, factoring, private financing, government and EC grants, and many more.

### 3 Year Business Plans Instantly!

BusinessPlan Builder financials include:

- 1-3 Year Projected Balance Sheets,
- 1-3 Year Projected Profit & Loss
- 1-3 Year Projected Cash Flows
- Break-even Analysis
- Ratios

BusinessPlan Builder removes the drudgery of creating financials from scratch, endlessly copying the same information between spreadsheets. BusinessPlan Builder features pre-structured financial templates ready for use, simply type in your company income and expenditure

details and BusinessPlan Builder will automatically calculate totals, percentages and ratios, creating your projected financials for 3 years. Numbers flow from one financial statement to another and you can use your spreadsheet application to graph any item in your financials.

### Reference Database

BusinessPlan Builder features an on-line database containing thousands of useful names and addresses - including MPs, ombudsmen, research institutes, trade and consumer associations, institutes and societies. These details can be copied and pasted into other packages.

### Business Information Forum (BIF)

Users of BusinessPlan Builder are entitled to 90 days to free access to Plan-IT's on-line business forum, B.I.F., which contains extensive information on business subjects.

## BusinessPlan Builder - 100% BRITISH business information.

You can be sure of BusinessPlan Builder's relevance to your business ideas because it is a 100% British development. All funding information is British and all the database information relates specifically to UK business needs. Over 2,500 names and addresses you need. Everything from the DTI, Health & Safety to MPs and Trade Unions!



B.I.F. covers topics such as:

- Funding & Debt Collection
- Exporting
- Tax, Law & Accountancy
- Marketing Research & P.R.
- Direct Marketing & Advertising
- Employment & Health & Safety

Information provided on the B.I.F. is compiled by a panel of experts from a range of industries. Users will be kept abreast of current developments.

### What they say about BusinessPlan Builder

"This is an excellent example of business productivity software which will make the user's life easier as well as the intended recipient of the business plan, for example, bank managers like myself!"

**Bank Manager, Small Business Loans Dept.**

"I found this an intuitive package that lead me through the process of writing a business plan in an easy to follow step-by-step process!"

**Graham Love, MD India Ocean Trading Co.**

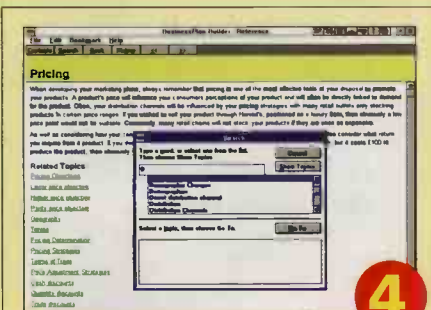
"This package will save me hours of time when developing business plans for my clients!"

**Richard Wall, Management Consultant**

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ONLY  
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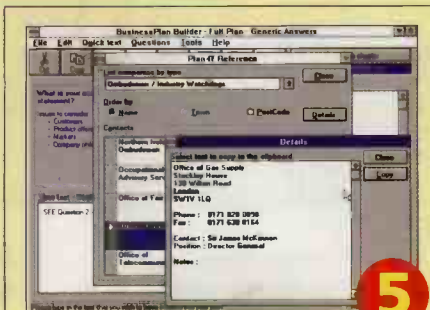
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## OR YOUR MONEY BACK!



### On-Line Help

Extensive on-line expert advice is available on the subject of writing business plans. Context-sensitive help ensures that all business reference information is available with a single mouse click, and comprehensive search options make it all easy.



### Reference Database

On-line database of thousands of useful names and addresses. Includes MPs, ombudsmen, research institutes, trade and consumer associations, institutes and societies, and health & safety organisations. All information can be copied into other packages.

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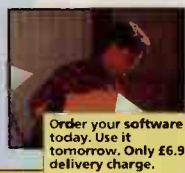
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## SYMANTEC FEATURE

### REMOTE COMMUNICATIONS

#### Norton pcAnywhere Version 2 for Windows

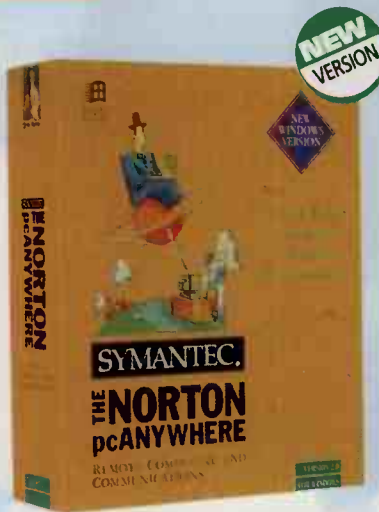
pcAnywhere is the most reliable and easy-to-use remote computing and communications software. It is trusted by over 1.4 million users worldwide!

pcAnywhere is invaluable to anyone who runs a network and demands the highest standards in productivity. pcAnywhere gives remote end users instant access to critical data and applications at their home, office or, indeed, anywhere!

pcAnywhere is the proven leader in remote communications - with the proven reliability and security that you need.

#### NEW FEATURES FOR NORTON pcANYWHERE VERSION 2:

- **It's easier to Use.** 'Cue-Cards' displays help information automatically, depending upon the location of the user's cursor. 'The Norton Assistant' walks users through the configuration process and other common tasks. 'File Manager' now includes File Synchronisation, Clone and Compare to automatically synchronise files and directories on remote and office PCs.
- **Installation is easy and reliable.** 'Smart Setup' detects system configuration automatically, thereby minimising potential system conflicts.
- **You get reliable network access.** Supports all popular networks. Plus new TCP/IP support allows fast and reliable access to data across networks and improved integration of workgroups.
- **Improved security.** pcAnywhere provides password protection, data encryption, restrictable drive access,



restrictable file transfer rights, host logs and can deny or acknowledge a call.

- **Designed to run under Windows 3.1 and Windows '95!** When Microsoft decide to finally ship Windows '95 your pcAnywhere is guaranteed to be compatible.
- **Runs 25% faster than pcAnywhere 1.0!** The most popular remote control software is now even faster.

|  |     |
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| PC Anywhere V2 WIN (NOR016).....       | £92 |
| PC Anywhere V2 Host WIN (NOR023) ..... | £58 |
| PC Anywhere V2 Remote WIN (NOR024).... | £58 |
| PC Anywhere V5 DOS (NOR004) .....      | £94 |
| PC Anywhere V5 Remote DOS (PCA001) ..  | £89 |

### UTILITY SOFTWARE

#### PC Tools Version 2 for Windows

The number one-selling utilities package for Windows - now with new security and performance enhancing features

There has never been an easier way to Increase your productivity, protect your data and tune your system for maximum performance in Windows. Building on the success of the award-winning version 1.0, PC Tools for Windows 2.0 introduces many new features to improve the performance of your PC, whilst maintaining standards of quality and ease-of-use.

The favourite features from version 1.0 are still available, including MultiDesk for optimum organisation, Anti-Virus and Backup for data protection, file viewers including Word-Perfect DOS 6.0 and support for PKZip 2.x.

#### NEW FEATURES:

- **CrashGuard** warns you before system resources reach critical levels and a crash is likely
- **System Consultant** now has a "Do-It" button to implement recommendations for better Windows performance
- **INI-Consultant** provides plain English descriptions of cryptic system files
- **File Companions** puts file management where you need it most - inside applications



|                                  |     |
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| PC Tools (Win) (TOO008).....     | £49 |
| PC Tools Pro (DOS) (PCT002)..... | £79 |



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### UTILITIES

#### Norton Utilities Version 8

The standard in PC desktop utilities.

Incorporating classic data protection utilities such as Disk Doctor and Speed Disk and Calibrate, the Norton Utilities checks for problems on your hard disk before they occur, and optimises disk access times, to keep your computer running trouble-free and at peak performance, day-in and day-out.

Norton Utilities Version 8 (NOR022).....**£88**



### ANTI-VIRUS

#### Norton Anti-Virus V3

The best defence for your PC.

The No.1 selling anti-virus program for both Windows and DOS. This new version includes Symantec Novi, which detects unknown viruses and repairs infected files. This two-in-one anti-virus program is the complete detection and protection system for your peace of mind.

Norton AntiVirus (NOR021).....**£95**



### UTILITIES

#### More PC Tools

An outstanding collection of utilities to increase your productivity including 5 great new programs:

**DriveCheck:** Checks your hard drive for faults.

**DriveSpeed:** Improves hard disk transfer times.

**BackTrack:** Logs changes to your files.

**CrashGuard Pro:** Helps prevent system crashes and helps you recover lost / damaged data.

**SystemInfo Pro:** Improves system reliability.

More PC Tools (PCT003).....**£45**



### UTILITIES

#### X-Tree Gold V.4 for Windows

The fastest way to manage and find your files in Windows.

XTree Gold for Windows performs file management just like XTree Gold for DOS. Same keystroke sequences, same menus, same commands. So if you already use XTree Gold for DOS, you'll find it really easy to use XTree Gold for Windows.

X-Tree Gold V.4 for Win (XTRO06).....**£52**



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Only **£38<sup>95</sup>**

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- ✓ First AID explains problems in simple English
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- ✓ FIRST AID's 'Undo' function removes risk from trying unsuitable solutions
- ✓ FIRST AID has built-in support for multimedia and network environments
- ✓ FIRST AID is easy to use, it pops up automatically when there's a problem



FIRST AID's easy to use interface makes solving problems a snap!



**ESSENTIAL**  
for all  
non-techies!

### What if your computer could fix itself?

FIRST AID is the first software package that will fix technical problems for you. It's like having a tech. support expert inside your computer! It's the essential utility for all "Non-Techies".

### How does it work?

When an error message appears, FIRST AID pops up, analyses and explains the situation in plain English, then offers to fix it automatically. If you agree to FIRST AID's suggestion and click the 'Fix' button the problem will be corrected immediately. Rewriting system or configuration files need never be a nightmare again. BUT DON'T WORRY, all the changes you make are logged so you can print or even undo them later if you change your mind.

### What sort of problems will it fix?

Every time a new application is installed on a Windows PC the configuration files (such as WIN.INI) are automatically modified and conflicts may occur. FIRST AID has a knowledge base that can detect and fix over 1,000 of these common configuration problems such as:

- Sound card and CD-ROM drive configurations
- OLE registration problems
- Errors in WIN.INI and SYSTEM.INI problems
- Network access
- Printing problems
- Misplaced drivers and DLLs
- Incorrect Parameter settings
- Bad Path settings

### FREE BONUS - HyperText User Guide

In addition to FIRST AID's powerful problem fixing tools, there is also included a unique HyperText on-line user guide.

Packed with useful information, hints, tips and the accumulated wisdom of thousands of Windows experts, this HyperText guide acts as an invaluable reference as well as an effective learning tool.

Whether you need advice on hardware, software, printing or network issues - the HyperText User Guide tells you how to get the best performance from your system.



**Auto Fix**

## D.I.Y Windows Support...

**FIXES CD-ROMs**



Resolve CD configuration problems instantly!

CD-ROM drives, interfaces and drivers are notoriously difficult to install and configure. FIRST AID will test, configure and explain (in plain English) what it suggests is done and what will happen.

**CONFIGURES Sound Cards**



Test and optimise your Soundcard

FIRST AID's Problem Panel will show any Driver problems and then solve any conflicts with a click of the Fix button. Then simply press the Test button and hear the results!

**RESTORES Software Apps**



Solve application and setup operation conflicts

FIRST AID fixes problems with INI files and missing application components for: Microsoft Office, Lotus SmartSuite, Quicken, CorelDraw, Fox Pro, Harvard Graphics, WordPerfect, Perfect Office, and many more!

**OPTIMISES Windows™**



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PerfectOffice 3.0 integrates software like no other suite available today. A new PerfectFit™ technology takes you beyond common look-and-feel integration to a suite that offers complete inter-connection between programs. With a common user interface, all your programs share consistent toolbars, pull-down menus and key dialogue boxes. Each program looks and feels alike - making it easy for you to master each application quickly and with the minimum of fuss.

PerfectOffice 3.0 offers OLE 2.0 functionality in more programs than any other suite. So now you can simply drag and drop data between suite applications, i.e. you can drag a chart from Quattro Pro into a WordPerfect document, or even edit a Presentations image while in a WordPerfect document.



word and grammar correction features far superior to anything currently available in other suites. The intelligent find and replace feature actually understands the meaning of words and their different forms. For example you can search for all forms of 'go' (go, goes, went, gone, going) and replace them with corresponding forms of 'fly' (fly, flies, flew, flown, flying) automatically!

PerfectSense will also help you write better English by automatically rewriting entire sentences for your consideration, correcting both spelling and grammatical errors. Complete sentences can be corrected in just one click of a button - proof reading your business letters just got a whole lot easier!

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The Desktop Application Director (DAD) is a customisable toolbar that makes navigation through the Perfect Office suite a snap. With DAD you can switch among applications, manage, locate and view files, and automate common tasks with a mouse click. For convenience, DAD can be located anywhere on the desktop as a floating palette.

#### What You Mean Is What You Get

Perfect Office features new PerfectSense™; a number of intelligent

#### Perfect Office Professional

Perfect Office is now also available with Paradox Version 5, the powerful database that it easy to use and includes its own programming language, and Visual App Builder 1, a fifth generation visual programming tool.

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| Perfect Office Pro Comp. Upg. CD.....  | <b>£239</b> |
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#### WORDPERFECT 6.1

### WordPerfect 6.1 for Windows

The perfect way to create better looking documents!



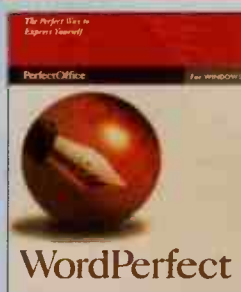
As the latest version in the WordPerfect word processing family, WordPerfect 6.1 for Windows sets new standards for document processing. From easier-to-use interface enhancements to sophisticated and intelligent automation tools, WordPerfect's new capabilities strengthen their reputation as the best wordprocessor for Windows.

This new version includes Grammatik 6 - the intelligent grammar checker, new QuickFinder and QuickCorrect features and a whole range of new templates giving you professional looking documents - faster!

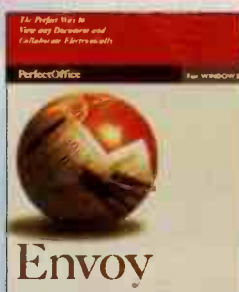
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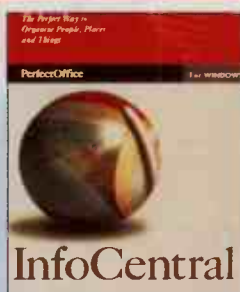
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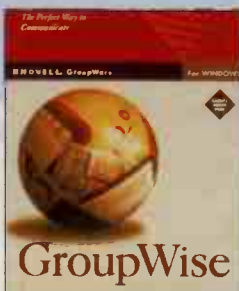
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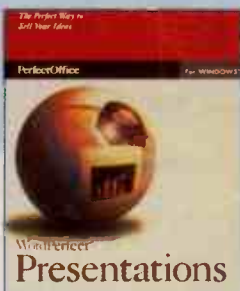
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| CD RRP ..... £99               |
| <b>OUR PRICE £89.00!</b>       |
| PRICE (INC. VAT) ..... £104.58 |

**Lotus**

### SOFTWARE SUITES

## NEW!! The No.1 Software Suite AND Lotus Notes Together!

### Lotus NotesSuite for Windows

NotesSuite is the only group of applications designed to improve the productivity and responsiveness of teams by delivering true workgroup and multi-ser solutions

By combining the unique collaborative power of Notes with the familiar desktop tools of SmartSuite, Lotus NotesSuite provide s corporate teams with instant groupware solutions. With NotesSuite, companies can build effective office and business support systems.

Including Lotus Notes Rel. 3.2 and the latest versions of SmartSuite applications: Lotus 1-2-3 Rel.5, AmiPro 3.1, Approach 3.0, Freelance Graphics 2.1, ScreenCam 1.1 and Lotus Organiser 2.0, NotesSuite features the NotesSuite Application Collection:

#### Introductory Application

This database contains descriptions of Notes, Notes/FX and specific Notes/FX applications to new users. It includes a full introduction to Notes infrastructure, a description of the business process capabilities and a listing of resources within the Notes community.

#### Library Application

These databases serve as corporate information sources that store everything from customised document templates to past and present sales presentations. Both SmartMaster and Freelance libraries use Notes to ensure that new or updated libraries are deployed throughout the organisation.

#### Business Process Applications

These databases leverage SmartSuite and Notes to automate business processes that manage the workflow for tasks such as Expense reports and Contact management. Features include fully shared Workgroup Documents, Expense Reports, Contact Management, Customer Price Quoter and Customer Suggestions.

#### Information Services Applications

These databases provide up-to-the-minute news, financial and industry information that can be included in reports, competitive analysis and sales alerts.

License Pack (LOT081) **£529**  
License Pack Upgrade (LOT082) **£429**

|                                |
|--------------------------------|
| STOCK CODE ... LOT080          |
| CD RRP ..... £999              |
| <b>OUR PRICE £849!</b>         |
| PRICE (INC. VAT) ..... £997.58 |

**Lotus**

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5 Awards

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Customer Service Winner

### SOFTWARE SUITES

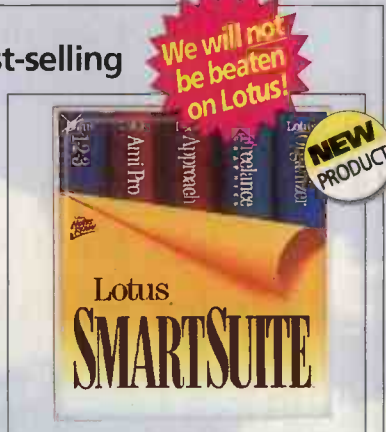
## Lotus SmartSuite 3.0 - Best-selling suite now available in NEW CD Version

The best-selling software suite is now available on disk or CD. New version includes multimedia-help and quicker installation - ideal for multi-site license users.

The SmartSuite 3.0 CD-ROM Edition Includes the 1-2-3 Release 5 spreadsheet, the Approach 3.0 database, the AmiPro 3.1 word processor and the Freelance Graphics presentation application, all specifically designed to take advantage of Notes /FX 1.1, the Lotus facility for exchanging data bi-directionally between desktop applications and Lotus Notes.

The SmartSuite CD-ROM also includes Lotus Organiser 1.1, the information manager and the multimedia screen and sound-capture utility ScreenCam 1.1. The SmartCenter Icon Palette is included and allows easy switching and drag and drop copying between applications.

The new CD version of SmartSuite offers MS managers all the software included in the disk-based version but with the added benefit of considerable time savings on installation and the time spent looking for Viruses, which are eradicated by virtue of the technology.



We will not be beaten on Lotus!

**NEW PRODUCT**

Version Upgrade Disk (LOT052) **£179**  
Version Upgrade CD (LOT076) **£179**  
Comp. Upgrade Disk (LOT052) **£249**  
Comp. Upgrade CD (LOT076) **£249**  
Lotus SmartSuite CD (LOT075) **£335**

|                                |
|--------------------------------|
| STOCK CODE ... LOT065          |
| RRP ..... £399                 |
| <b>OUR PRICE £335.00!</b>      |
| PRICE (INC. VAT) ..... £393.63 |

**Lotus**

### WORD PROCESSING

### Lotus AmiPro V.3.1

The Best Windows Word Processor!

If you are looking for a word processor that's not only easy to use but packed with useful features, then look no further than Ami Pro. Using all the latest word processing features, AmiPro is the obvious choice for individuals and workgroups.

It also has the new Document Sharing Application that helps you to share and manage your files, and features 55 professionally designed style sheets for memos, fax sheets, reports.

Version Upgrade **£39**

|                                |
|--------------------------------|
| STOCK CODE ... LOT039          |
| CD RRP ..... £299              |
| <b>OUR PRICE £89.00!</b>       |
| PRICE (INC. VAT) ..... £104.58 |

**Lotus**

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Software Warehouse stock all Lotus products - Call us if you don't see what you require

**same-day shipping on orders placed before 3pm. Call 0675 466 467**  
Remember! Before ordering by fax or post check the offers on the last page of our advert **Fax 0675 466 460**

ALL PRICES EXCLUDING VAT. E&OE.





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256 x 9(256K) Simm £12  
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## 72 Pin

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1 x 32 (4mb) Simm 70ns £105  
1 x 36 (4mb) Simm 70ns £112  
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**DELIVERY CHARGES**

1-20 PIECES = £5.50 GUARANTEED NEXT DAY DELIVERY

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In the unlikely event that the memory we supply is not compatible with your PC we guarantee 24 hour swap-out/replacement free of charge.

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# TIME

## Computer Systems Ltd.

### - THE COMPANY



Time Computers HQ site is situated in the Ribbles Valley near the M65 & M66. Over 99.2% of systems despatched arrive with customers the following day.

Long established as a standard-setter in the computer market, Time Computers has always been the first choice of customers who demand quality products at competitive prices with reliable service and back-up. Time Computers are now firmly established as the leading direct PC supplier in the UK with a customer base of well over 150,000.

As well as achieving soaring sales and rapid growth we have also established an excellent reputation for our professional approach to supplying quality computer solutions. We have the resources, know how, and financial strength to keep us ahead with all the latest advances in computer technology and to respond quickly to market trends and the needs of our customers.

We were the first company to offer complete bundled solutions at affordable prices, the first to offer interest free credit in the direct PC market and the first to successfully develop the direct retail showroom concept.



Time computers 'invented' the bundled PC solution for the mass market

To ensure the quality of our products and to provide you with the latest technology, we have forged strong working relationships with the giants of the industry. Our direct relationships with the world's leading hardware and software manufacturers coupled with the strength of our volume buying and our efficient centralised operation with its low overheads also means that we are able to offer the keenest prices on the very latest products.

To ensure the satisfaction of our customers, we have developed a pre-sales advice and after-sales customer and technical support service that's second to none. We have invested heavily in our personnel and operations, to ensure our customers



The Time Logo is synonymous with Quality, Service and Value amongst consumers and small businesses (SOHO market).

receive the best service available from every department in the company. Staff are trained to be efficient and helpful, and we always endeavour to achieve complete customer satisfaction.

We were one of the first and still one of few computer companies who have implemented BS5750 quality standard. We are fully certified to BS5750 Part 2 (ISO9002) for the purchasing,



Your representatives within Time Computers - Some members of the Customer Service Team.

assembly, sales, configuration, repair, installation and maintenance of computer systems. It is a testament to our commitment to quality, value and service that the majority of our sales are the result of repeat purchases or personal recommendations.

The products described here offer only an illustration of the enormous range of computer related equipment we carry. If you have any specific requirements not detailed here, why not call our expert sales consultant on (01282) 777 111, who will be able to offer you all the assistance you need, to help you make the right decision.



INDEPENDENT RETAILER OF THE YEAR



Certificate No: FS28122



# TIME SERVICES

We believe Time Computers' success story is a direct result of our commitment to listening to our customers needs, and most important of



*Sales staff are friendly, knowledgeable and will be able to answer all the questions you have about buying a PC solution.*

all, delivering those needs promptly. In our book the customer comes first.

It is our overall commitment to exceptional customer support programmes and high quality solutions that has put us where we are today - in a unique position of being able to offer the keenest priced solutions with the best service in the industry.

## PRE-SALES ADVICE

Our knowledgeable sales staff are fully trained with what is available in the PC industry and are happy to



*The sales team are fully trained and will guide you through the selection process.*

give you free advice on the most suitable make and model for your requirements. Please feel free to give them a call any time to discuss the features and benefits of any computer solution.

## CONFIGURATION & TESTING

Remember when you buy from Time Computers you are not limited to the standard configurations. Any options such as additional RAM, Multimedia products, Fax modems and extra drives that you may require will be installed in your PC system to make a solution tailored to your needs. The system will then be fully tested so that you can start using it immediately.

## SOFTWARE PRE-INSTALLATION

In most cases any bundled software will be pre-installed by our engineers and optimised for your system. This will save you many hours of time and will enable you to start using your system immediately. Many of you who are new to computers, experience most difficulties when installing software. Our service removes this hurdle and allows you to start learning and being productive with your software from the moment you receive your system. On most systems documentation and on-line help are also pre-loaded making it easier to learn these applications. On-Line help is context-sensitive, providing relevant help when you are stuck. Traditional pre-printed manuals and backup disks are also available as options if required.



*Installing software is the most difficult task for new users.*

## HARDWARE TECHNICAL SUPPORT

One of the main advantages of dealing directly with Time Computers is the facility to seek help from trained PC experts. Our technical support staff will provide free hotline support should your system ever malfunction, or if you wish to upgrade.

## CUSTOMER SERVICE

Customer Services Staff liaise closely with your sales contact, and will act as your representatives within the company, and ensure that your queries are speedily resolved.



*Technical help is always only a phone call away*

## WARRANTY

All goods carry 12 month's return-to-base warranty except where otherwise indicated. In addition, Time Cover offers a valuable extended 3 or 5 year warranty on PC Systems, covering all parts, labour and carriage costs to ensure long term trouble-free use. Please ask for details when placing your order.

## COMPREHENSIVE REPAIR/UPGRADE FACILITIES

We have in-house fully equipped facilities to repair the vast majority of products we sell. This means that you have very fast turn around should your system ever go faulty. Our upgrade service will enable you to keep your system future-proof by installing new processors, RAM and larger storage devices.



*Upgrade service enables you to keep your system future-proof*



# BUYING FROM TIME - DIRECT IS BEST

There is no doubt that the customer gets better value in terms of price, specification and support when they buy PC systems Direct. When you buy from Time Computers you not only have all the advantages of buying Direct but also advantages of having a wider range to choose from and retail showroom facilities.

## WIDER RANGE

Time Computers is a multi-vendor direct company.

Unlike other direct suppliers who are usually limited to one brand of PC (usually their own brand), Time Computers offers the best value products from the world's leading PC manufacturers (such as IBM, Compaq, Toshiba and Mitac) thus giving you more choice.



## TIME

## SHOWROOM FACILITIES

Our showroom facilities enables us to provide the most popular systems for display throughout the UK. This enables you to see and use the system before you decide to buy at the same time as having full access to all of our range of direct services provided by our specialist staff.

Retail Showrooms are available in the following sites. Please call for details.



Time Computers have a showroom presence throughout the UK.

- GREAT PORTLAND ST
- STRAND
- TOTTENHAM COURT RD
- KNIGHTSBRIDGE
- VICTORIA
- KENSINGTON
- BRIGHTON
- WATFORD
- CRAWLEY
- AYLESBURY
- MANCHESTER
- DARLINGTON
- IPSWICH
- BIRMINGHAM
- CLIFTON (BRISTOL)

## HOW TO ORDER

Look through the offers and decide on the solutions which interest you most. Then call our sales team on (01282) 777 111. They can provide further advice and clarify any points. You can place your order directly with your sales contact over the phone and give details of the system you require. Payment can be made using Access, Visa, Switch or American Express. You can also send your order by fax, or post, if more convenient, including a cheque for the full amount made payable to Time Computer Systems Ltd (please allow 5 working days for cheques to clear).

## CREDIT

Interest Free Credit (APR 0%) is also available on some solutions and options (subject to status). All solutions advertised with Interest Free Credit can also be paid for in full by credit card or cheque. If you wish to take out interest Free Credit, please let your sales contact know when placing your order. Systems which are not available on Interest Free Credit may be purchased on credit at a competitive APR (Annual Percentage Rate) of 19.8% over a 24 month period, subject to status. Please ask for further details.

## DELIVERY

After your order is placed and payment cleared (or credit agreement approved), your system will be tested and despatched by courier to your preferred address. If you are not in to receive the system, the courier will leave a message for you to contact the local depot and re-arrange delivery.

Goods are normally despatched within 7 to 10 days from cleared payment. All orders will be fulfilled within 28 days unless otherwise specified. Mainland insured courier delivery rates are listed as follows.

£ 19 plus VAT (£ 22.33) for PC Systems  
£ 15 plus VAT (£ 17.63) for Printers and Peripherals  
£ 10 plus VAT (£ 11.75) for smaller items purchased separately

## PRICES

System prices are shown without VAT (17.5%) and Delivery. All Interest Free Credit prices include Delivery & VAT. Please note that prices are subject to change and that these offers in this current advert are limited whilst current stocks last. Please order early to avoid disappointment. All trademarks are acknowledged. Prices, specifications and offers are subject to change, availability and subject to our conditions of sale copies of which are available on request. Please contact our sales staff for the latest up to date details. E&OE.



Finance Department, where the most popular customer request is for Interest Free Credit.

## INTEREST FREE EXAMPLE

| The following example shows a typical purchase.<br>All these interest free prices include delivery & VAT |                      |         |                     |          |
|--|----------------------|---------|---------------------|----------|
| Cash purchase  | Credit Purchase      | Deposit | 24 Monthly Payments | Total    |
| Lotus Time Machine A £1019.90  | Lotus Time Machine A | £323.90 | £29                 | £1019.90 |
| Laser Pack £509.95   | Laser Pack           | £53.95  | £19                 | £509.95  |
| Total (Inc. Del & VAT) £1529.85  | Totals               | £377.85 | £48                 | £1529.85 |

### TOTAL CASH PRICE = TOTAL CREDIT PRICE

Interest Free Credit is available subject to status. Written quotations are available on request. Be sure you can afford the payments before entering into a credit agreement.

The deposit may be paid by credit card or cheque. Most customers also purchase other options (e.g. floppy discs, 3 year extended warranty, Multimedia kit etc). Most of these are also available on Interest Free Credit whilst others can be paid for by increasing the deposit. Please call for details.



# Lotus Time Machines

## SYSTEM SPECIFICATION

- 50MHz 486 processor with 16K internal cache (IBM Blue Lightning) or 186DX-66 processor (at extra cost)
- 4Mb or 8Mb RAM
- 1.44Mb floppy drive
- 250Mb, 340Mb or 540Mb IDE hard disks
- 32-bit VESA Local Bus
- Windows Accelerator with 1Mb Video RAM
- 14" 0.28dp SVGA non-Interlaced low radiation colour screen
- Desktop or Mini-Tower Case
- 102 keyboard and Microsoft compatible mouse
- DOS 6.3 and Windows™ 3.11
- Manufactured by IBM in the UK
- 12mths warranty extendable to 5 years

## Fax & Internet Pack 1

- Pace MobiFax BABT approved data and fax modem
- Delrina Winfax Lite Fax software
- Communications software
- Introductory subscription to CompuServe with Internet Mailbox



## PRE-LOADED SOFTWARE

Please see pages 12 onwards for details

### Business Software

- Lotus Software suite including Lotus 1-2-3, Ami Pro, Approach, Organizer 1, SmartPics and Lotus Training
- GST Pressworks 1 and Designworks 2
- TurboCAD for Windows
- AutoRoute Express for Windows
- Paciol 2000 Accounts
- Masterclips SE

### Educational Software

- Windows Training
- Fun School 4, Fun School Maths and Typing Tutor
- Borland SideKick for Windows

### Leisure Software

- Arts & Letters Draw
- Doom, Blake Stone, Pinball and Raptor Games

These amazing high performance 486 systems (manufactured by IBM UK) come complete with a powerful suite of the best business, educational and leisure programs and provide the ideal solution for the home and business user.

The superb award winning Lotus software will satisfy all your needs for wordprocessing, filing, organizing, graphics and number crunching. A complete desktop publishing suite from GST will enable you to publish newsletters, adverts and even books! We have also included AutoRoute, the best selling electronic road atlas,

TurboCAD design and CAD package and a full feature accounts suite to help you put your finances in order.

These systems have now been enhanced to include a Pace Fax and Internet Pack and can function as full feature fax machines. They can also allow you to get on-line to services such as the Internet and CompuServe.

From just £28 per month on Interest Free Credit, virtually anyone can now afford the complete PC solution.



## Mini-Tower Models

(Time Machines B and C) feature a larger case with 8 slots and 6 drive bays. The same software bundle and Fax & Internet pack are included.

### Time Machine A

Desktop 486-50 model with 250Mb hard drive & 4Mb RAM

# £28

£347.90 deposit &  
24 monthly payments of £28.00  
Total price £849+VAT = **£1019.90**  
Inc delivery & VAT. APR 0%

### Time Machine B

Mini-Tower 486-50 model with 340Mb hard drive & 4Mb RAM

# £38

£166.65 deposit &  
24 monthly payments of £38.00  
Total price £899+VAT = **£1078.65**  
Inc delivery & VAT. APR 0%

### Time Machine C

Mini-Tower 486DX2-66 model with 540Mb hard drive & 8Mb RAM

# £48

£337.90 deposit &  
24 monthly payments of £48.00  
Total price £1249+VAT = **£1489.90**  
Inc delivery & VAT. APR 0%



# Multimedia Time Machines

## SYSTEM SPECIFICATION

### 486 Models

- 486DX2-66 or 486DX4-100 processor
- 540Mb or 730Mb fast IDE hard disks
- 4Mb or 8Mb RAM expandable to 64Mb
- 1.44Mb floppy drive, 256K external cache
- Pentium technology upgradeable
- VESA SVGA graphics controller with 1Mb
- 14" or 15" SVGA non-interlaced low radiation colour screen with 0.28dp
- Desktop case (new design) with 5 drive bays and 7 slots
- 102 keyboard and mouse
- PC DOS 6.3 and Windows™ 3.11
- Manufactured by Mitac in the UK
- 12mths warranty extendable to 5 years

### Pentium Models

- Intel Pentium® 60, 75, 90 or 100MHz based processors
- 8Mb RAM expandable to 128Mb
- PCI Pentium board with PCI graphics and PCI IDE hard disks

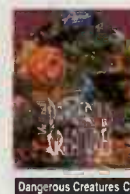
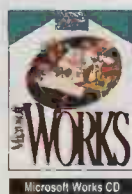
Rest of specification as 486 Models

### Multimedia Hardware

- Double or Quad speed IDE CD-ROM drive
- 16-bit high quality soundcard
- Twin stereo speaker system
- PC joystick

### Fax & Internet Pack 1

- Pace MobilFax BABT approved data and fax modem
- Delrina Winfax Lite Fax software
- Communications software
- Introductory subscription to CompuServe with Internet Mailbox



## PRE-LOADED SOFTWARE

Please see pages 12 onwards for details

### Business Software

- Lotus Software suite including Lotus 1-2-3, Ami Pro, Approach, Organizer 2, SmartPics and Lotus Training
- GST Pressworks 2 and Designworks 2
- TurboCAD for Windows
- Organize Your Way
- CV & Job Search Pro
- Pacioli 2000 Business Accounts
- Masterclips SE and Picture This!
- Quicken v4 Personal Finance

### Educational Software

- Windows Training and Windelete
- Fun School 4, Fun School Maths and Typing Tutor
- ComputerWorks, BodyWorks, EZ Language French, German and Spanish

### Leisure Software

- PC Paintbrush
- Arts & Letters Draw and Wired for Sound lite
- Doom, Blake Stone, Pinball and Raptor Games

### Microsoft® Multimedia Software

- Microsoft Encarta '95 Encyclopaedia CD
- Microsoft Works CD
- Microsoft Golf CD
- Microsoft Beethoven CD
- Microsoft Dangerous Creatures CD

The Multimedia Time Machines are powerful, high specification 486 and Pentium systems that provide the complete solution for the home and small business environment. They all come with excellent business software from Lotus and other leading manufacturers plus a range of educational and leisure software. All are fully multimedia ready with fitted CD-ROM drives, 16-bit soundcards and a superb range of CD Multimedia titles from Microsoft. Also included is the Fax and Internet Pack

from Pace allowing these systems to function as a powerful fax machine and allowing you to get on-line to services such as CompuServe and the Internet. At these amazing prices with Interest Free Credit available for a limited period, these systems are without doubt the best computer solutions for the home and small business user. Add a quality Printer Pack or Scanner Pack (available on Interest Free credit) for a complete solution.

APR  
**0%**  
**INTEREST FREE CREDIT**

Interest Free Credit is available subject to status. Written quotations are available on request. Be sure you can afford the payments before entering into a credit agreement. See page 3 for Interest Free example. Software is pre-loaded. Pack shots shown for illustration only. See page 12 onwards for software details.

### Multimedia Time Machine 1 486DX2-66

486DX2-66 with 540Mb hard drive, 4Mb RAM and 14" screen

**£39**

£159.15 deposit and 24 monthly payments of £53.00 OR  
£495.15 deposit and 24 monthly payments of £39.00

Total price £1199.00+VAT = £1431.15  
Inc delivery & VAT. APR 0%  
486DX4-100 Upgrade .....£100  
RAM Upgrade to 8Mb .....£Call

### Multimedia Time Machine 2 486DX4-100

486DX4-100 with 730Mb hard drive, 8Mb RAM and 15" screen

**£49**

£199.65 deposit and 24 monthly payments of £66.00 OR  
£607.65 deposit and 24 monthly payments of £49.00

Total price £1499.00+VAT = £1783.65  
Inc delivery & VAT. APR 0%

### Multimedia Time Machine 3 Pentium 60

Pentium 60 with 540Mb hard drive, 8Mb RAM and 14" screen

**£59**

£186.40 deposit and 24 monthly payments of £69.00 OR  
£426.40 deposit and 24 monthly payments of £59.00

Total price £1549.00+VAT = £1842.40  
Inc Delivery & VAT. APR 0%

### Multimedia Time Machine 4 Pentium 75, 90, 100

Pentium 75 with 730Mb hard drive, 8Mb RAM and 15" screen

**£69**

£229.40 deposit and 24 monthly payments of £77.00 OR  
£421.40 deposit and 24 monthly payments of £69.00  
Total price £1749.00+VAT = £2077.40  
Inc delivery & VAT. APR 0%

Pentium 90 Upgrade .....£200  
Pentium 100 Upgrade .....£300

**TIME**  
Computer Systems Ltd.

Granville House,  
Blackburn Road,  
Simonstone,  
Burnley, BB12 7GT

**CALL NOW!**  
Sales Lines Open  
Mon-Fri 8.30am-7pm  
Sat. 9am-5pm



**01282 777 111**



5AA

5



# BUY NOW

\* Pay only £130.70 deposit with NOTHING more to pay for 6 months

## PC SPECIFICATION

Superb 486-50 system manufactured by IBM with 340Mb hard drive, 256K cache, fast VESA graphics and excellent screen. New comes complete with Pace fax and Internet Pack 1

- Fast 50 MHz 486 processor with 16K internal cache and fitted maths co-processor
- 256K high speed external CPU cache
- 340Mb 13ms super fast IDE hard disk
- 4Mb RAM expandable to 64Mb
- 32-bit VESA local bus 1024 x 768 graphics with 1Mb video RAM
- Expandable Mini-Tower case with 6 bays and 8 free slots
- 14" high resolutions 0.28 dot pitch MPRII low radiation non-interlaced SVGA colour screen
- 3.5" 1.44Mb floppy drive
- 2 serial ports, parallel port, mouse port & keyboard port
- 102 key keyboard and IBM mouse
- Latest PC DOS 6.3 and Microsoft Windows 3.1 pre-loaded
- 12mth warranty extendable to 3 years
- Manufactured by IBM UK

## FAX & INTERNET PACK

- Pace Fax & Data Modem
- Fax & Data software
- Introductory subscription to CompuServe

## Time Machine 3SM

A superb IBM manufactured Colossus system with the world's best software available on an incredible Interest Free Credit offer. Pay just £130.70 deposit and pay nothing more for 6 months!



## PRE-LOADED SOFTWARE

- Lotus 1-2-3 v5 for Windows
- Lotus Ami Pro v3.1 for Windows
- Lotus Approach v3 for Windows
- Lotus SmartPics for Windows
- Lotus Organizer for Windows
- IMSI Windows Training Package
- Individual Training for 1-2-3
- Individual Training for Ami Pro
- Individual Training for Approach
- AutoRoute Express v3 for Windows
- Designworks v2 for Windows
- Pressworks for Windows
- Pacioli 2000 Accounts
- TurboCAD v2 for Windows
- Borland Sidekick for Windows
- MasterClips SE Clip Art
- Flying Fingers Typing Tutorial
- Arts & Letters Draw for Windows
- Fun School 4
- Fun School Merlin Maths
- DOOM Virtual Reality Game
- Raptor Flight Action Game
- Pinball Simulation Game
- Blake Stone Graphics Game

# ...PAY LATER £48.80 Per Month

66MHz 8Mb 540Mb Time Machine 3SMX

As above specification but with 66MHz 486DX2 processor, 540Mb drive and 8Mb RAM £160.45 deposit, no further payments for 6 months, then 24 monthly payments of £59.80  
Total price £1339 + VAT = £1595.65 Inc delivery and VAT.

\* After 6 months pay just £48.80 per month over 2 years on Interest Free Credit.  
Total price £1089 + VAT = £1301.90 Inc delivery & VAT APR 0%



£549  
£667.40 Inc. Delivery & VAT

## Winstations

High performance tower systems with Lotus software suite from just £549 +VAT!

### PC Specification

- 486sx-25, 486-50 or 486DX2-66 processor
- 4Mb RAM expandable to 32MB (8Mb models at extra cost)
- 3.5" 1.44Mb floppy drive
- 127Mb, 250Mb or 340Mb IDE hard disks
- 32-bit local bus graphics with windows accelerator
- 14" 0.28dp Non-interlaced SVGA MPRII low radiation colour screen
- Colossus Mini-tower case with 6 drive bays and 8 16-bit free slots
- Parallel, mouse and 2 serial ports
- 102 keyboard and mouse
- PC DOS 6.3 and Windows 3.1

WinStation 1 486SX-25 127Mb .....£549

VESA WinStation 5 486-50 250MB .....£599

VESA WinStation 6 486-50 340Mb with 256K cache and Maths coprocessor .....£699

VESA WinStation 7 486DX2-66 340Mb...£799

VESA Winstation previously offered on credit. This offer ended 18th March.

### Software

(see page 12 onwards for details)  
The following software applications are preloaded. Lotus backup disks and printed manuals are available as options.

- Lotus 1-2-3 v5 Spreadsheet
- Lotus Ami Pro v3.1 Wordprocessor
- Lotus Approach v3 Database System
- Lotus SmartPics Graphics
- Lotus Organizer
- AutoRoute Express v3 for Windows
- Pacioli 2000 Accounts

340Mb models come with extra software including:-

- Individual Training for Lotus 1-2-3, Ami Pro and Approach
- Lotus Smart-text On-line documentation
- GST PressWorks v2 for Windows
- GST DesignWorks for Windows
- BodyWorks, AutoWorks, ComputerWorks and much more

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Sat. 9am-5pm

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# Multimedia POWER PC

## PC SPECIFICATION 486 Models

- 486DX2-66 or 486DX4-100 processor
- 540MB or 730MB fast IDE hard disks
- 4Mb or 8Mb RAM
- 1.44Mb floppy drive
- 256K external cache
- Pentium technology upgradeable
- VESA SVGA graphics with 1Mb
- 14" or 15" SVGA NI low radiation colour screen with 0.28dp
- Desktop case (new design) with 5 bays and 7 slots
- 102 keyboard and mouse
- DOS 6.3 and Windows 3.11
- Manufactured for Time by Mitac in the UK
- Multimedia hardware and Fax and Internet Pack included as standard (see below)



## PRE-LOADED SOFTWARE

Please see pages 12 onwards for details

- Lotus 1-2-3 v5 Spreadsheet
- Lotus Ami Pro v3.1 Wordprocessor
- Lotus Approach v3 Database
- Lotus Organizer v2
- Lotus SmartPics Graphics
- Lotus Training for 1-2-3, Ami Pro and Approach
- GST PressWorks 2 Desktop Publishing Pack
- GST DesignWorks 2 Art & Graphics Pack
- Pacioli 2000 Business Accounts
- Quicken v4 Personal finance package

### Multimedia Software

- EZ Language Multimedia CD Learn French, German, Spanish and more
- World Atlas CD
- Play & Learn Educational CD
- Shareware CD with many excellent games

If you are looking for a powerful complete Multimedia solution, the Multimedia Power PC represents the best value. These 486 and Pentium systems have a high specification which includes large hard drives, fast controllers and plenty of expansion potential.

All are fully multimedia ready with fitted CD ROM drives, 16-bit soundcards, an excellent range of CD titles and come with the Pace Fax and Internet Pack, allowing these

systems to function as a powerful fax machine and allowing you to get on-line to services such as Compuserve and the Internet.

Also included is a range of excellent business software from Lotus and GST which will handle all your requirements for wordprocessing, filing, number crunching, organizing, graphics, accounts and desktop publishing. At these special introductory prices, these systems are a great buy.

### ALL MODELS INCLUDE:

#### Pentium Models

- Intel Pentium 60, 75, 90 or 100 processors
- 8Mb RAM expandable to 128Mb
- PCI Pentium board with PCI graphics and PCI IDE hard disks
- Rest of specification as 486 models

#### Multimedia Hardware

- Double speed or Quad speed IDE CD-ROM drive
- 16-bit high quality soundcard
- Twin stereo speaker system
- PC Joystick

#### Fax & Internet Pack 1

- Pace MobilFax BABT approved Data and Fax Modem
- Delrina Winfax Lite Fax software
- Communications & On-Line software



Quicken v4



EZ language CD



Play & Learn CD



World Atlas CD



Shareware CD

## Multimedia POWER PC 1

### 486DX2-66

486DX2-66 with 540Mb hard drive, 4Mb RAM and 14" screen

£899

486DX4-100 Upgrade .....£100  
RAM Upgrade to 8Mb .....£Cali

## Multimedia POWER PC 2

### 486DX4-100

486DX4-100 with 730Mb hard drive, 8Mb RAM and 15" screen

£1199

## Multimedia POWER PC 3

### Pentium 60

Pentium 60 with 540Mb hard drive, 8Mb RAM and 14" screen

£1249

## Multimedia POWER PC 4

### Pentium 75, 90, 100

Pentium 75 with 730Mb hard drive, 8Mb RAM and 15" screen

£1449

Pentium 90 Upgrade .....£200  
Pentium 100 Upgrade .....£300

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Tel: 01282 777 111 Fax: 01282 770 701. All prices exclude delivery and VAT (17.5%). See page 3 for ordering instructions. \*All software applications are preloaded. Pack shots are shown for illustration only. Printed manuals and backup disks are available as options. E&OE





# PowerStation 4

LIMITED OFFER



A truly amazing high performance Colossus Tower PC (manufactured by IBM) with massive expansion potential, VESA Local Bus, 340Mb hard disk, Pentium upgradeability, and fitted with some of the fastest 486 processors currently available. All this together with the latest Lotus applications and other leading business products for an amazing £699 + VAT.

**£699**

£843.65 inc del & VAT  
486DX2-66 £799+VAT

## Powerstation 4

- Mini-Tower case with 6 drive bays and 8 free expansion slots
- 4Mb RAM expandable to 64Mb
- 340Mb 13ms Super fast IDE hard disk
- 486DX2-66 processor or IBM 486-50 (enhanced 486-50 with 16K internal cache IBM Blue Lightning) processor
- State of the art 32-bit VESA Local Bus Windows accelerator with 1Mb video RAM
- 14" Non-Interlaced high resolutions 0.28 dot pitch MPRII low radiation SVGA colour screen
- 3.5" 1.44Mb floppy drive
- 2 serial ports, parallel port, mouse port & keyboard port
- 102 Key keyboard and IBM mouse
- Latest PC DOS 6.3 and Microsoft Windows 3.1 are pre-loaded
- 12months warranty extendable to three years
- Manufactured by IBM UK

## Pre-loaded Software

- Lotus 1-2-3 v5
- Lotus Ami Pro v3.1
- Lotus Approach v3
- Lotus Organizer 1
- Lotus SmartPics
- AutoRoute Express
- Pacioli 2000 Accounts
- GST DesignWorks v2
- GST PressWorks v1
- Individual Training

## Powerstation 4 CDM

**£1099**

The 486 PC for the Power User.  
As above specification but with

- 486DX2-66 Processor
- 8MB RAM
- 540MB Hard Drive
- Fitted Double Speed CD ROM
- Pace Modem Pack (Fax & Internet Pack 1)
- Software bundle as above

## Powerstation 3C



The Desktop Powerstation with similar specification to Mini-Tower models above but with 3 drive bays and 3 free slots. Also comes fitted with 256K Cache. Includes 340Mb hard drive and the same software bundle.

PowerStation 3C 486-50 4MB ..... **£699**

PowerStation 3C 486DX2-66 4MB ... **£799**

PowerStation 3CD 486DX2-66

8MB & CD-ROM..... **£999**

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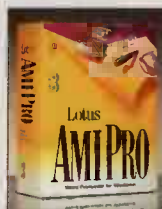


# IBM Aptiva Solution

# Compaq Multimedia PC



LOTUS 1-2-3 v5



AMI PRO v3.1



LOTUS APPROACH v3



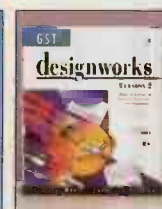
SMART PICS GRAPHICS



LOTUS ORGANIZER v2



GST PRESSWORKS 2



GST DESIGNWORKS 2



QUICKEN v4

The new IBM Aptiva PC is the perfect entry level solution for the home. Only models from Time Computers come with the additional Lotus software suite, GST DTP & Graphics suite, New Quicken v4 Personal Finance Pack and the Pace Fax & Internet Pack.

Please give us a call for the latest Aptiva and Aptiva multimedia offers.

The Compaq Presario Multimedia PC is an ideal introduction for the home user. These amazing computers include full multimedia, fax, communications and voice facilities and come with a wealth of excellent software.

The pre-loaded Lotus software suite, other software and additional CD titles are only available from Time Computers.

Several Compaq Presario models are available and our offers may change because of continual improvements. Please give us a call to discuss the latest special offers and specifications.

## Aptiva Specification

- 486SX-33, 486DX2-50, 486DX2-66, 486DX4-75 or 486DX4-100 Processor
- Intel Overdrive Upgradeable
- 4Mb Ram or 8Mb; Max 64Mb/128Mb
- 270Mb, 540Mb or 730Mb Local Bus IDE Hard Disk
- VESA Local Bus Technology
- 3.5" 1.44Mb Floppy Drive
- Integrated VESA Local Bus Graphics
- 4 Drive Bays & 4 Slots
- Parallel, Serial and Mouse Ports
- 14" SVGA Low Rad Colour Screen
- MS Compatible Mouse & 102 Keyboard
- PC Dos 6.3 & MS Windows 3.1
- Microsoft Works v3 & AptivaWare Software
- 12 Months Warranty extendable to 3 years.
- IBM Helpline support.

Pace Fax & Internet Pack is included with some models. Call for details.

Multimedia Models include 16-bit soundcard, stereo speakers, fitted double speed CD-ROM drive, PC Joystick and CD Multimedia titles.

**FROM  
£39**

Systems are available from £39 per month on Interest Free Credit.  
APR 0%.  
Please give us a call for latest specifications and offers.

## Pre-loaded Software

Included with IBM and Compaq systems.  
See page 12 onwards for details.

- Lotus 1-2-3 v5 Spreadsheet
- Lotus Ami Pro v3.1 Wordprocessor
- Lotus Approach v3 Database
- Lotus Organizer v2
- Lotus SmartPics Graphics
- Lotus Training for 1-2-3, Ami Pro and Approach
- Pacloli 2000 Business Accounts
- GST PressWorks 2 Desktop Publishing Pack
- GST DesignWorks 2 Art & Graphics Pack
- New Intuit Quicken v4 for Windows Personal Finance Package

Plus additional software & CD titles with Multimedia systems  
Please call for details

APR

**0%**

**INTEREST FREE CREDIT**

Interest Free Credit is available subject to status. Written quotations are available on request. Be sure you can afford the payments before entering into a credit agreement. See page 3 for Interest Free example. Software is pre-loaded. Pack shots shown for illustration only. See page 12 onwards for software details.

## Compaq Specification

- 486SX2-66, 486DX2-66, 486DX4-90 or Pentium Processor
- 4Mb or 8Mb RAM expandable to 64Mb
- 270Mb, 420Mb, 540Mb or 730Mb Hard Disk
- 3.5" 1.44Mb floppy Drive
- Enhanced Local Bus SVGA Graphics with 1MB RAM
- Desktop case (shown) with 3 drive bays and 3 expansion slots or compact case
- Serial parallel, Joystick, MIDI and Mouse ports
- 14" Low Radiation NI SVGA Colour Screen
- 16-bit stereo soundcard, Microphone & Speakers
- High Speed Multisession CD ROM Drive
- Integrated Fax/Data Modem with telephone answering & Compuserve. (on some models only)

### Compaq Software Bundle (May Vary)

DOS 6.2, Windows 3.1, Tabworks, Welcome Centre, Control Centre and Learning Centre  
Microsoft Works v3, Microsoft Money and Microsoft Entertainment Pack, Microsoft Encarta Encyclopedia CD, The Ultimate Human Body CD

**FROM  
£49**

Models are available from £49 per month on Interest Free Credit.  
APR 0%.  
Please give us a call for latest specifications and offers.

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9AA

9



# Mitac 486

## Powerstation

# Mitac 586

## Powerstation

### System Specification

- 486DX2-66 or 486DX4-100 processor
- 340Mb, 540Mb or 730Mb fast IDE hard disks
- 4Mb or 8Mb RAM
- CD-ROM Drive (shown) is £100 extra
- 1.44Mb FD. 256K external cache
- Pentium technology upgradeable
- VESA SVGA graphics with 1Mb
- 14" or 15" SVGA NI low rad colour screen with 0.28dp
- Desktop case (new design) with 5 bays and 7 slots
- 102 Keyboard and Mouse
- DOS 6.3 and Windows 3.11
- Manufactured for Time by Mitac in the UK



### System Specification

- Intel Pentium 60, 75, 90 or 100 Processor
- 540Mb or 730Mb fast IDE hard disks
- 8Mb RAM (Max 128MB)
- CD-ROM Drive (shown) is £100 extra
- 1.44Mb FD. 256K external cache
- PCI SVGA graphics with 1Mb or 2Mb (at extra cost)
- 14" or 15" SVGA NI low rad colour screen with 0.28dp
- Desktop case (new design) with 5 bays and 7 slots
- 102 Keyboard and Mouse
- DOS 6.3 and Windows 3.11
- Manufactured for Time by Mitac in the UK

### Mitac 486

The 486 Mitac PowerStation is an incredible high performance PC system ideal for the business user and professional. It features fast 486DX2-66 or 486DX4-100 processors with a choice of high performance hard disks, and superb graphics.

These systems are very expandable and can be tailored to your requirements with additional CD and multimedia options, extra RAM, high performance Modems and Scanners.

The excellent business software from Lotus, GST and Intuit is all you will need to keep you fully productive. At a price of just £699, the Mitac PowerStation is the best value PC in the UK today.

### Preloaded Software

Included with all systems.  
See page 12 onwards for details.

- Lotus 1-2-3 v5 Spreadsheet
- Lotus Ami Pro v3.1 Wordprocessor
- Lotus Approach v3 Database
- Lotus Organizer v2
- Lotus SmartPics Graphics
- Lotus Training for 1-2-3, Ami Pro and Approach
- Paciolli 2000 Business Accounts
- GST PressWorks 2 Desktop Publishing Pack
- GST DesignWorks 2 Art & Graphics Pack
- New Intuit Quicken v4 for Windows Personal Finance Package

### Mitac 586

The 586 Mitac PowerStation is the ultimate system for the Power User. It features the very latest technology from Intel and has an incredible, specification which can be tailored to your requirements. The Pentium 75 Model is our best buy and can be upgraded to Pentium 90 or Pentium 100 in the future.

All systems include the excellent business software from Lotus, GST and Intuit.

#### Mitac PowerStation 1 486DX2-66

486DX2-66 with 340MB hard drive, 4MB RAM and 14" screen

# 699

540MB Model £749  
486DX4-100 Upgrade £100  
RAM Upgrade to 8MB £Call

#### Mitac PowerStation 2 486DX4-100

486DX4-100 with 730MB hard drive, 8MB RAM and 15" Screen

# 1049

#### Mitac PowerStation 3 Pentium 60

Intel Pentium 60 CPU with 540MB hard drive, 8MB RAM and 14" screen

# 1099

#### Mitac PowerStation 4 Pentium 75, 90, 100

Intel Pentium 75 CPU with 730MB hard drive, 8MB RAM and 15" Screen

# 1299



# Mobile Comms Office

Time announce an incredible range of high performance notebook solutions from Toshiba, Compaq and Texas Instruments that come ready to use with excellent business software from Lotus and Intuit.

All these systems also come with a complete fax and internet pack including a BABT Approved Intel PCMCIA or Pace MobiFax portable modem with appropriate fax and comms software. Fax your documents to anyone and connect to your PC to your base and many other on-line services with ease. At prices of just £49 per month on Interest Free Credit, these mobile Comms office solutions are going fast. Hurry place your order today!

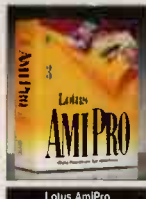
APPROVED for collection of telecommunication systems specified in the instructions for use subject to the conditions set out in them

APR  
**0%**  
INTEREST FREE CREDIT

Interest Free Credit is available subject to status. Written quotations are available on request. Be sure you can afford the payments before entering into a credit agreement. See page 3 for Interest Free example. Software is pre-loaded. Pack shots shown for illustration only. See page 12 onwards for software details.



Lotus 1-2-3



Lotus AmiPro



Lotus Approach



Lotus Organizer v2



Lotus SmartPics



Autroute Express



Quicken v4

## TOSHIBA



The ideal entry level business solution with T1910 Mono and Colour models, Intel Modem and Software preloaded

- Intel 486SX-33 Processor
- 4MB or 8MB RAM
- 200MB IDE Hard Disk
- VGA Mono or Dual Scan Colour Screen
- Trackball Mouse
- 1.44Mb floppy drive
- PCMCIA type II or III slots and standard ports
- MSDOS 6.2 and Windows 3.1
- Intel PCMCIA Fax & Data Modem with Software
- Business Software Suite (Shown above)

## COMPAQ



The superb Compaq Contura TFT Colour models with Pace portable modem and business software suite. Simply the best buy in TFT colour notebooks

- Intel 486DX-25 Processor
- 4MB or 8MB RAM
- 120MB or 209MB IDE Hard Disk
- Superb VGA TFT Colour Screen
- Built-In Trackball Mouse
- 1.44Mb floppy drive
- All standard ports
- MSDOS 6.2 and Windows 3.1
- Pace Portable Fax & Data Modem with Software
- Business Software Suite (Shown above)
- Compaq 3 year Warranty

## TEXAS INSTRUMENTS



Texas instruments latest 4000M models with built-in Multimedia, Intel Modem and Preloaded Software. The CD-ROM portable dock is also available as an option on Interest Free Credit

- Intel 486DX2-50 or 486DX4-75 Processor
- 4MB or 8MB RAM
- 340MB or 455MB IDE Hard Disk
- VGA Dual Scan or TFT Colour Screen
- 1MB VESA Video
- Built-in 16-bit Soundcard, Microphone and Speakers
- Built-in Point Mouse
- Adaptec Fast SCSI-II Port
- Optional CD-ROM Drive
- 1.44Mb floppy drive
- PCMCIA II/III and all standard ports
- MSDOS 6.2 and Windows 3.1
- Intel PCMCIA Fax & Data Modem with Software
- Business Software Suite (Shown above)

### Toshiba Comms Office 1 486SX-33 200MB 4MB MONO

# £49

£255.15 deposit and 24 monthly payments of £49.00 Total price £1199.00 +VAT = £1431.15 inc. Delivery & VAT. APR 0%

### Toshiba Comms Office 2 486SX-33 200MB 4MB COLOUR

£725.15 deposit and 24 monthly payments of £49.00 Total price £1599.00 +VAT = £1901.15 inc. Delivery & VAT. APR 0%

RAM Upgrade 4MB to 8MB £160

### Compaq Comms Office 1 486DX-25 120MB 4MB TFT Colour

# £69

£245.15 deposit and 24 monthly payments of £69.00 Total price £1599.00 +VAT = £1901.15 inc. Delivery & VAT. APR 0%

### Compaq Comms Office 2 486DX-25 209MB 4MB TFT Colour

£480.15 deposit and 24 monthly payments of £69.00 Total price £1799.00 +VAT = £2136.15 inc. Delivery & VAT. APR 0%

RAM Upgrade 4MB to 8MB £155

### TI Comms Office 1 486DX2-50 340MB 4MB Dual Scan Colour

# £97

£278.15 deposit and 24 monthly payments of £97.00 Total price £2199.00 +VAT = £2606.15 inc. Delivery & VAT. APR 0% RAM Upgrade 4MB to 8MB £185

### TI Comms Office 2 486DX4-75 455MB 8MB TFT Colour

£440.15 deposit and 24 monthly payments of £149.00 Total price £3399.00 +VAT = £4016.15 inc. Delivery & VAT. APR 0%

### Portable CD ROM Dock

£147.65 deposit and 24 monthly payments of £29.00 Total price £699.00 +VAT = £843.65 inc delivery & VAT. APR 0%

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11A





# Lotus General Business Applications

The following pages describe the software applications which may be included with your PC system. Please refer to the individual system offer to see which applications are included. In most cases software is pre-loaded with on-line help with an easy to use menu system enabling you to be productive instantly.

When it comes to general business applications, Lotus leads the world in high quality state of the art software products. Innovative preloaded Lotus Doc-on-line provides the complete set of Lotus manuals in electronic format to enable you to learn these applications quickly. The latest releases of these award winning applications incorporate all the advanced features to enable you to get the most out of your PC system. We firmly believe that the Lotus Suite of products is the best you can buy at ANY price and we recommend this range for your general business applications.

## Lotus Ami Pro for Windows

Lotus Ami v3.1 for Windows is the latest version of this superb easy to use wordprocessing package that lets you write letters, produce documents and even write books. It includes advanced features such as different headers and footers on alternate page, outlining, and generation of a table of contents plus much more.

- **POWERFUL WORD PROCESSING**  
SmartMerge provides a step-by-step guide to mail merge. Proof-read your work with the Spell Checker, Thesaurus and Grammar Checker. Produce an outline, table of contents and index in seconds.
- **GIVE YOUR DOCUMENT THE PERSONAL TOUCH**  
With over 55 professionally designed style sheets that you can customise to suit your needs, it's easy to produce professional looking documents; everytime.
- **COMPATIBILITY WITH OTHER APPLICATIONS**  
Read documents from a wide variety of sources, including WordPerfect, Microsoft Word and more. Do not worry if your company uses another brand, the built-in Switch Kit makes the transition to Lotus Ami Pro simple. You can also read a variety of spreadsheet, database and graphic files.
- **Drawing, Charting & Page Layout**  
Create frames in your document for flexible placement of editable text and graphics, or create your own graphics with the built-in freehand drawing tools and over 25 different chart types.

## Lotus 1-2-3 for Windows

Lotus 1-2-3 Release 5 for Windows (RRP £ 365 +VAT) spreadsheet is one of the most flexible applications available and will enable you to do virtually anything with numerical information.

It includes database functions as well as a wide range of scientific and financial ones. WYSIWYG will let you see the typefaces that you have included in your sheet on the actual sheet. Its' macro language will enable you to automate operations when performing complicated calculations and it can generate charts or graphs automatically, simply by highlighting an area of data on the sheet.

- **INCREASED PRODUCTIVITY**  
SmartMaster templates give you a head start producing forecasts, financial statements and more. Lotus Maps displays your spreadsheet data on a colour-coded map. One-Step Charting creates a chart with a single click of the mouse.
- **THE LATEST IN SPREADSHEET PUBLISHING**  
Multi-Page Print Preview displays up to 9 spreadsheet pages before printing. Fast Format copies formatting information from one range to another. Designer Frames give charts and tables a professional look.
- **DATABASE POWER AT YOUR FINGERTIPS**  
Unique integration with Lotus Approach's data management capabilities lets you easily build forms and customised reports or rearrange views using Dynamic Crosstabs. You can now open dBase and Paradox files directly into your spreadsheet.
- **OLE2 SUPPORT**  
Drag and drop. Move or copy your data between Lotus 1-2-3 files with visual mouse cues to assist you. No other spreadsheet can do this.
- **WORKGROUP READY NOW**  
Version Manager allows multiple sets of data to be saved in the same cell, along with the "who, what, when and why" of each version. New Range Routing lets you mail a range to colleagues for input, then roll everyone's ideas back into your file.

## Lotus Approach for Windows

New Lotus Approach v3 for Windows is basically a computerised filing cabinet but with very advanced features which allows you to handle any information with ease.

- **GETS YOU STARTED QUICKLY**  
No other database will help you get started faster. You don't have to be a programmer to use Lotus Approach. Lotus Approach includes SmartMaster, templates for popular database applications and Assistants to quickly build your reports, mailing labels, forms, crosstabs and charts.
- **KEEPS YOU PRODUCTIVE**  
With features such as NoteTab interface, Query by From and SmartSummary calculations, Lotus Approach's built in usability keeps you productive as your requirements grow and change.
- **POWERCLICK REPORTING**  
Generate professional reports with unprecedented ease. Customise reports with a WYSIWYG report writer that lets you see the changes as you make them.
- **UNRIVALLED INTEGRATION**  
Lotus Approach offers transparent access to popular PC databases such as dBase, Paradox, FoxPro, Oracle, Access, and SQL Servers. Unrivalled integration enables you to report and analyse live Lotus 1-2-3 data.
- **POWER AND SPEED**  
Full relational power. X10 speed technology, automatic record locking, crosstabs, charting and advanced macro capabilities ensure the ability to build powerful, customised applications.

## Lotus Organizer for Windows

Lotus Organizer for Windows is a full-feature Personal Information Manager that allows you to manage your time & work. It is effectively your own personal secretary with some very advanced features.

### ■ PERSONAL ORGANIZER

On-screen book appearance with section tabs and pages that turn to make you feel at home from the start.

The Calendar lets you arrange appointments and confirm meetings

The To Do List helps you keep track of every last detail.

The Planner gives the broader picture, making it easier to plan and monitor long term projects.

The Address book can store up to 65,000 names, addresses and telephone numbers - all available in an Instant.

The Notepad lets you jot down free-form Ideas.

### ■ EASY LINKING

Link entries from different sections for easy cross-referencing, then move freely and instantly among linked entries.

### ■ FLEXIBLE PRINTING

Print in any page in formats designed to fit your manual planner. Create mailing labels sorted by specific criteria.

## Lotus SmartPics for Windows

Lotus SmartPics Graphics consist of the finest Clipart, i.e. high quality images that can cover a wide range of topics and which can be easily incorporated into documents created by a wordprocessor, Spreadsheet, Desktop Publishing or Drawing Package.

Use these amazing colourful and versatile images when you need to add that extra sparkle to business presentations, or enhance memos, reports, overheads and handouts. Thirty general business categories include: realistic people, business symbols, international icons, computers, military, medical illustration, backgrounds and memorable cartoons - just to name a few.

## Lotus Training for 1-2-3

## Lotus Training for Ami Pro

## Lotus Training for Approach

Individual Training Packages are provided for Lotus 1-2-3, Lotus Approach and Lotus AmiPro. The packages cover upto the previous version of each of the Lotus products. Lotus On-Line help covers the latest information on the new Lotus releases.

These packages help you master your PC and software in less time than any other method. They include high quality graphics and sharp screen displays and a glossary of key terms. Individual Training offers you complete step-by-step training to teach you everything you need to know, from the basics to the most advanced topics. These programs provide you with a quick and easy method to master new skills and to advance in the software applications.

Individual Training offers extensive topic coverage and helps you understand basic to advanced skills, concepts, menus and on-screen messages. Guided Lessons allow you to advance at your own pace and provide practice sessions with useful examples, illustrations and helpful hints to make learning easy. Quiz sections at the end reinforce learning.



# Other Business Software Applications

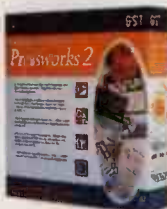
In addition to the main-line business application (such as Word-processing, Spreadsheet, Database etc.) there are other programs which are very useful for business and professional use. We have selected the best products to be included with some of our systems.



## GST DesignWorks v2 for Windows

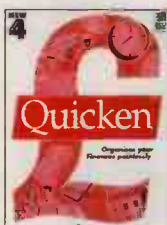
GST Designworks v2 for Windows (RRP £ 149 +VAT) is a powerful drawing package like CorelDRAW that allows you to create logos and other business graphics. Drawings created can also be used in other applications such as a Desktop Publisher or a Wordprocessor.

DesignWorks is the ideal design tool for adding flair and impact to your work. Whether you want to create a logo for your newsletter, add professional graphics to presentations and reports, or create a colourful poster or eye-catching invitation. DesignWorks gives you the power to do all of this quickly and easily.



## GST PressWorks v2 for Windows

PressWorks v2 (RRP £ 149) is a full-feature Desktop Publishing Program (DTP) with a wealth of powerful features and lets you produce full colour reports, memos, presentations, advertisements, brochures and catalogues. In fact, just about any printed page where good presentation is important. PressWorks supports OLE2, text, graphics, colour, word processing, spell check with thesaurus, paragraph styles, powertext, typefaces, templates, language support, clip art, text run-around, typography, photo CD and screen snapshots.



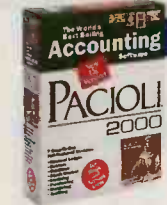
## New! Quicken Uk 4.0 for windows

Quicken is the fastest, easiest way to organise your home and small business finances. It manages bank and credit card accounts, mortgages, loans and investments, in any currency. It calculates VAT automatically and provides detailed analysis with its customisable reports and graphs. Quicken is easy to use and quick to update. Standing orders are entered automatically and your transactions are memorised, ensuring you never have to type an entry twice. From the records you enter, Quicken gives you the 'big picture' view of your finances, using the indicators of your choice. And with this information at your fingertips, planning your financial future is easy!



## Autoroute Express UK v3 for Windows

Autoroute Express for Windows (RRP £ 99 +VAT) is a colourful, computerised road atlas, with simple-to-read maps and easy-to-follow directions. Forget fumbling with fold out maps or messing with mileage charts. Autoroute takes all the trouble out of travel. Just tell Autoroute when and where you're starting and where you're heading. Just set your driving style and speed. Autoroute takes it from there, showing the quickest routes, fastest routes, country routes, most economical routes - in fact, which ever route is right for you. So before you hit the road on business or head off on holiday, check the route with Autoroute.



## Pacioli 2000 Accounts

Pacioli 2000 is a full featured accounting software package that combines ease-of-use with the power and features required by most businesses. Help is given so that people who are not fully fledged accountants, can use this program. Pacioli features eight fully featured modules including Nominal Ledger, Stock Control, Invoicing and Budgeting. This package outperforms many accounting systems costing over £500.



## IMSI TurboCAD v2 for Windows

TurboCAD v2 for Windows (RRP £99 +VAT) is a full-featured desktop drawing and drafting (CAD) software that will have you creating professional drafting, plans and drawing with ease and with incredible speed. It is very advanced and powerful yet very easy to use. Now everyone can do Home Designs (Kitchens, Bathrooms) Business Floorplans, Landscapes and much more. Optional extra libraries of drawings are available for specialist use. Unlike other CAD programs, a maths co-processor is NOT required to run this excellent CAD program.



## Microsoft Office CD Bundle

Microsoft Office CD Bundle consists of 9 excellent Microsoft applications on CD and is available with any system fitted with a CD drive for a small extra charge. Applications include Microsoft Excel, Microsoft Word, Microsoft PowerPoint, Microsoft cc:Mail Licence, Microsoft Works, Microsoft Encarta 95, Microsoft Dangerous Creatures, Microsoft Multimedia Beethoven and Microsoft Golf.

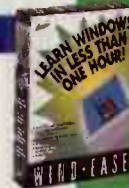
## IMSI Masterclips SE

Masterclips SE Intro is not an application but a collection of drawings. It includes some of the highest quality and creative clip art available. This can be used to highlight and enhance presentations, reports, proposals newsletters and other materials. Images are provided for use with most graphics software applications. The Images are full colour and vector art files which allows the graphics to be recoloured, rotated, manipulated, and resized without jagged lines.



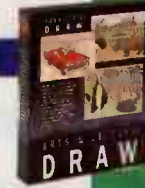
## IMSI Windows Training

IMSI Wind Ease allows you learn Windows in less than One Hour. Wind Ease is perfect for beginners, allows you to start with the basic lessons and move to advanced Windows features at your own pace. There are dozens of tips and techniques that even the experienced Windows user can learn from. You will find loads of information on features you may never have used before. You are shown how to install and use other applications, how to set up printers and fonts, how to create time saving macros, and how to set up and run a DOS application under Windows.



## Arts & Letters Draw

Arts & Letters Draw for Windows is another drawing package that is remarkable easy to use and which has a complete set of drawing tools, allows curve editing, 300 clipart images, 8 True Type fonts, and symbol libraries. WinDelete



## WinDelete

WinDelete is the safe and simple Windows Uninstaller. When windows applications are installed, files may be placed in several directories. WinDelete tracks and logs all the files placed on your hard disk and allows you to uninstall these programs easily thereby making room for new programs and speeding up Windows performance. Incorporates easy point and click options with context-sensitive help.



## Picture This! for Windows

Picture This! is the complete professional image manager and editor for anyone working with any type of images. It is the fastest, easiest way to organize and enhance your Images. This one package helps you keep track of your image files; organize them into albums; convert graphics files between popular formats (E.g. BMP, GIF, JPEG, PCX, TIFF and more); capture screen images on your computer; even do professional photo retouching (overlay, edge, sculpt, emboss and adjust colour and sharpness) and special effects. It supports Photo CDs and TWAIN scanners.



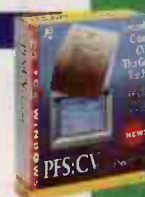
## Organise your Way

Things to Do! Places to Go! & People to See! Organize your Way v4 for Windows bridges the gap between personal information managers (e.g. Sidekick) and complex contact managers by combining both of these functions to produce an easy, yet powerful information and contact manger. It includes a database, calendar, to-do-list, and a contact manger that offers unmatched ease-of-use and flexibility.



## PFS: CV & Job Search Pro

CV & Job Search Pro for Windows enables you to tackle those Job interviews with confidence. Create impressive CVs and cover letters that stand out. It incorporates a flexible CV Builder, a Job Search Manager as well as comprehensive wordprocessing features. CV Builder automatically formats entire CV and includes templates for Business, Academics, Recent Graduates and more. Job Search Manager includes prospects database and allows scheduling of interviews and follow-ups.



## PC Paintbrush for Windows

PC Paintbrush for Windows is the latest version of this classic professional painting package that includes very advanced features. This superb package is the ultimate in creativity and lets you create, edit, manipulate, colourize, texturize and Paint anything you can imagine! It ranks as No.6 on the IDC list of best selling software of all time. Other painting programs only give you a small taste of how much fun painting can be. PC Paintbrush is the ultimate and the art form of the future. Includes 87 painting tools; 14 kinds of paintbrushes, 5 kinds of air brushes, 4 spraycans, 6 pens, 4 markers, 4 crayons and much more



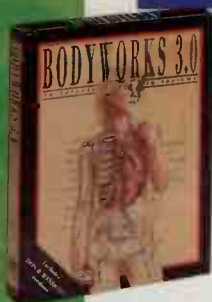


# Educational & Leisure Software

The PC is quickly becoming the ideal vehicle for education. The latest educational programs provide all the information needed by children and make learning fun.

The latest multimedia PC games have overtaken the games consoles in quality and features. Some of the best educational programs and games are included with certain PC systems from Time Computers.

## BodyWorks



BodyWorks v3 for Windows is the best selling interactive science adventure that lets you explore the human body. For all the fascinating "inside" information - how the eye sees, the inner workings of the heart, the different stages of pregnancy, experience Bodyworks and discover the miracle of the human machine.

- Colourful, photoquality graphics and vast database lets you study different internal systems (skeletal, muscular, respiratory, reproductive etc)
- Magnified views and cutaways reveal even the most elaborate cell structure and detailed animations bring the intricate functions of the body to life.
- Phonetic "Smart search" directs you to any part of the body and advanced "speech back" lets you hear the correct pronunciation
- Complete Health Section includes information on first aid, fitness, sports injuries, common illness, nutrition and more.
- Lesson plans and quizzes to enhance knowledge of the human anatomy
- Easy exporting of text and graphics to a wide range of printers for creation of customized reports for school and college.

## ComputerWorks

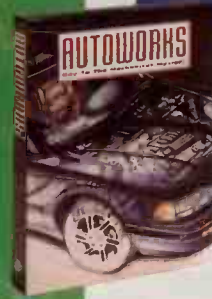


Computers have revolutionised the way we work, learn and play. Now you can explore the universe of microchips and megabytes on your own computer. From hard disks to software, ComputerWorks is your high-tech tour guide.

- Colourful animated graphics and comprehensive information highlight each component of the computer system, including the inner workings of monitor, drives, printers, CD-ROM, mice and other peripherals.
- In-depth history of the computer covers the evolution of computers from 500BC to the present day.
- Special "related topics" section explores key subjects including artificial intelligence, virtual reality, multimedia viruses, hacking, computer viruses and much more.
- Detailed lesson plans and challenging quiz sections provide helpful instruction, teaching you all about computers.
- Advanced interface lets you export text and graphics to create your own customized reports and print documents.

Whether you are new to computers or just wanting to know more about how a CD-ROM works, how a CPU "thinks" and interacts with the main circuitry, ComputerWorks is your High-Tech Tour Guide.

## AutoWorks



If you've ever looked under the hood at an engine and wondered what makes a car go... AutoWorks is your key to the mechanical mystery. Explore the world of spark plugs and pistons, fan belts and brakes, all without getting your hands greasy.

- Three-dimensional animated graphics bring to life the systems, structures and functions of your car with full-view displays, including top and side angles, show entire systems and how their parts interact.
- Detailed sections cover Engine (pistons, timing chain, camshaft, engine block) Drive train (Automatic transmission, Manual transmission, clutch, differential); Steering/Suspension (Ride joints, stabiliser bars, control arms, ball joints, shock absorbers); Exhaust/Emissions control (catalytic converter, alternative fuels, muffler/tailpipe); Fuel system (injection system, Turbocharger/supercharger); Cooling system (Thermostat, Radiator, water pump); Climate control (heating, air conditioning); brakes (disc/drum, anti-lock brakes, master cylinder); Electrical (starter, ignition, alternator, battery, spark plug); Safety system (air bags, seat belts)
- Fun car quiz tests your automotive knowledge and special trivia sections explore fascinating topics and print-out graphics and text for customized reports, and all graphics are exportable to PC files.

## Fun School for Windows



Fun School 4 for children aged 7 to 11, contains six of the best selling Fun School series which will delight, entertain and, most importantly, educate your children in a wide variety of skills. Each of these programs has been designed by a team of educationalists following guide-lines laid down by the National Curriculum. Fun School 4 is a unique learning package. It uses a variety of colourful and stimulating graphics along with numerous sounds which will encourage children's progress. There are three areas covered by this pack, Mathematics, Geography and History.

## Fun School Merlin Maths



Fun School Maths (Merlin's Maths) has been carefully designed to help children aged 7 and over with simple mathematical concepts and calculations whilst at the same time, having fun playing the six games. Each of the games has three difficulty levels and within each level the questions get harder the longer the child plays.

## EZ Language

The simple vocabulary and pronunciation tutor

EZ Language is the fun and easy vocabulary and pronunciation tutor. In just minutes you'll be learning over 400 new words and phrases. It's like having your own personal language instructor available at your command. See pictures with the words and listen to native speakers' voices. This Interactive program makes learning fun, fast and easy. Perfect for travellers, students, and others wishing to communicate in a new language.

**EZ Language French**

**EZ Language German**

**EZ Language Spanish**

-A picture is worth a thousand words

Colourful, descriptive graphics make learning fun and easy. Words and phrases appear in both English and the foreign language to help you learn.

-Hear the correct pronunciation and record your own voice

Your PC speaker or soundcard lets you hear native language speaker say the word or phrase properly. Then you can practice speaking by recording your own voice with a microphone and sound card.

-Measure your success

Multiple choice tests at the end of each section let you gauge your success. Review any areas where you need more practice or move on to the next lesson. You'll soon be speaking a new language.



## Flying Fingers Typing Tutor



Flying Fingers is an interactive typing course which operates within Windows. It is designed to improve your keyboard skills with the minimum of effort. It's built in family of tutors will give advice, encouragement so that you can develop your word processing skills. You will learn how to create immaculate layouts for letters and other documents. Also lessons can be planned in advance with its built in timeplan.

## DOOM



Knee-Deep in the Dead

Doom is the ultimate 3D adventure, bringing virtual reality action to your PC. This version includes 9 levels of 3D action and superb graphics. DOOM is the world's best selling graphics game! (Warning: This program may not be suitable for young children as it contains frightening monsters and violence! Delete DOOM facility is included for you to delete this game.)

## Blake Stone



The Star Institute

Terror reigns in this 3D action adventure. Set in a space station, you are British military agent Blake Stone, put into deadly combat with a mad scientist and his mutant army. Blake Stone uses the award winning technology from Wolfenstein 3D, plus added strategy and new graphical effects.

## Raptor



Bravo Sector

ca (The Raptor is a warship, and you have been chosen to pilot it into enemy territory. With each ship and ground target you destroy, you will earn the cash to buy new technology for the next wave. Raptor offers 256-colour VGA smooth scrolling graphics.

## Epic Pinball



Epic Pinball allows you to play pinball right on your PC. Smooth scrolling, lights, beacons and digital sound effect this game the best in its class. Epic Pinball bring ramps, sink holes, kickbacks, drop targets and multiple-ball play.



# Multimedia Software & Hardware

## CD ROM Multimedia Software

### BodyWorks 3 for Windows CD

Explore the system, structures and functions of the body in fascinating detail. (see BodyWorks opposite). This CD Multimedia version includes 3-D rotating views with detailed animation and video clips and all the features of the Disk version.

### UFO for Windows CD

UFO is the most complete guide to close encounters with over 1200 fully documented UFO sightings with actual photographs of the UFO sightings. Display, copy and print text and images through the Windows clipboard. A great tool for amateur or the expert sky watchers.

### IMSI EZ Language (6 Pack) Multimedia CD

Using pictures, words, and sound you can learn French, German, Spanish, Italian, Russian and Japanese. EZ Language is a simple vocabulary and pronunciation tutor on CD. You actually hear the correct pronunciation of word using this multimedia language product. Perfect for travellers, students and others wishing to communicate in a new language. Simple tests at the end of each section let you gauge your success.

### Zool 2 Multimedia CD

The latest CD version of this excellent platform game is better than ever. Zool 2 features the Ninja of the Nth dimension, a karate expert living on planet Loox, and his female partner Zooz. Their mission is to defeat the evil Krool who wants to conquer the known universe.

### World Atlas CD

This excellent educational encyclopaedia of the World allows you to access over 3000 topics including Geography, people, education, health, Government, crime, economy, agriculture, communication, travel and international organisations. Includes detailed maps, flags, anthems and much more.

### ShareWare CD

The Shareware CD is packed with almost 100 of the best Shareware programs and games covering every topic. Simply install the programs you need onto your hard disk. These games are simply excellent and will provide years of entertainment. Amazing value for money.

### Play & Learn Multimedia CD

Play and learn has been developed for children between the ages of four to ten. It contains many excellent programs including ten colourful animated games and a series of learning modules covering spelling and maths.

### Software Toolworks Multimedia Encyclopaedia CD

The amazing power of multimedia CD Rom technology has never been more evident than the Software Toolworks Grolier Multimedia Encyclopaedia. Forget printed encyclopaedias and get the best and most comprehensive multimedia encyclopaedia available. Based on the contents of a 21 volume encyclopaedia with over 33,000 articles. Five search and browse facilities enable you to source information quickly and easily.

### Dinosaur Museum CD

Transform your computer into a Time Machine with vivid sound, lavish colours and interactive games. Visit the Museum Room and learn detailed facts about dinosaurs including size, classification, behaviour and more. The Conservatory features exhibits on the biology of the Mesozoic era, and the Game Room tests your dinosaur IQ in two educational games for 1 or more players. Includes hundreds of photos plus movie clips.

### TIME Almanac of the 20th Century

Experience history as it happened with this unique multimedia CD reference title. Travel through the 20th century with full-motion video covering issues and events that shaped our time. Quickly retrieve maps and search through an archive of 4000 articles. Includes Newsquest quiz, every Time 'man of the year' story, 70 full-motion videos, 12 narrated essays and over 450 photographs.

### Microsoft Encarta 1995 CD

Microsoft Encarta 1995 is another superb multimedia encyclopaedia based on the contents of a 28 volume encyclopaedia. It includes over interactive charts & tables, stunning animation, videos, maps, charts, sounds and pictures.

### Microsoft Works CD

Microsoft Works 3 for Windows integrates easy to use word-processor, spreadsheet, database, drawing module and comms in one application on CD.

### Microsoft Golf CD

Microsoft Golf for Windows allows you to Tee off with upto eight golfing partners and move from driving range to practice green. It features unmatched photo-realistic scenery and stunning graphics, true golf ball flight, and easy accurate swing control.

### Microsoft Dangerous Creatures CD

Microsoft Dangerous Creatures is a superb multimedia title featuring some of the most exciting living things. Complete with high quality graphics, motion video and superb stereo sound, it provides education and enjoyment for everyone.

### Microsoft Multimedia Beethoven

This magnificent orchestral performance of masterworks by Beethoven lets you look closer into the composition in new ways highlighting the principal instruments, relates the piece to other works, and viewing the work in its social context.

### Mega CD Bundles

This superb bundle includes all of the programs covered on pages 12, 13, 14 and Autoroute (except Microsoft Office CD bundle) plus many more programs and comes loaded on CD-ROM. This CD bundle is only available bundled in with your PC system. As many of our systems already come with some of this software preloaded, prices of the Mega bundle vary depending on the system with which it is purchased. As well as providing extra software programs, the CD also serves as a backup of your pre-installed software should you need to re-install any applications. Please call for details.

## Multimedia Hardware

Multimedia systems come with some of the following hardware, all fitted and ready to use with a range of CD titles. These hardware items may also be added to other systems to build a system to your requirements.

- Double Speed CD ROM Drive
- Quad Speed CD ROM Drive
- 16-bit high quality soundcard with sound software
- Standard Speakers
- Large Speakers
- PC Joystick
- Microphone



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# Fax & Internet Packs

# Printer Packs <sup>APR</sup> 0%



Our Fax and Internet Packs will be very useful to all PC users and we strongly recommend this option to enable you to get the most out of your PC. We offer a choice of 3 Packs. All are also available on interest free credit (With IF Systems only). All Packs contain:-

## 1. A FAX AND DATA MODEM

**Pack 1:** Includes a Pace 24 V.22 bis Modem Fax and Fax modem. This is an external unit which comes complete with cable to attach to your PC. It comes complete with powerful Fax and Comms software and provides all the facilities you need.

**Pack 2:** Includes a 14.4 V.32bis Internal Fax and Data Modem. This is faster and more suited to prolonged data communications.

**Pack 3:** Includes a 14.4 V.32bis Fax and Data Modem with Voice Facilities. In addition to the Fax and Comms software, this also comes with SuperVoice voice software with automatic switching between Data, Fax and Voice. Your PC can function as a powerful answering machine with multiple mailboxes, a mini-bulletin board as well as a Fax machine and Comms station.

## 2. FAX SOFTWARE

Powerful Fax Software Included with each modem will convert your PC into a full-feature advanced Fax machine. You can receive faxes from other modems and standard Fax machines. These faxes are saved as a file on your hard disk and the software informs you automatically which faxes have arrived. These can then be looked at, inserted into other documents, printed or deleted. You can also send faxes created on your PC to other modems and fax machines directly without printing out anything.

## 3. COMMUNICATIONS SOFTWARE

Comms software will allow you to communicate and exchange information and software with other modem users. It will also enable you to link to other computers with access to many on-line services such as CompuServe and also link to the Internet. The Internet is the name given to the Information Super Highway which consists of many computers all over the world linked together via standard telephone lines. The Internet is essentially a public electronic mailing system but also includes other services. Worldwide communications over the Internet are very cost effective as you only pay local telephone rates.

## 4. MEMBERSHIP OF COMPUSERVE ON-LINE SERVICES WITH INTERNET MAILBOX.

- CompuServe Introductory Membership for the first month
- Usage credit of £10 to explore the chargeable services available
- WinCIM Windows Software that allows linking to CompuServe and enables you to use the services easily.
- CompuServe user booklet (Membership Guide for Windows)

CompuServe is the leading commercial provider of on-line information for PC users and has more than 2 million users worldwide who can access a huge range of global & local services and electronic mail usually by a local phone call. The range of services is wide and as well as CompuServe commercial and support services, members can also access the Internet (the world wide electronic mail system with mainly public domain services). Here are just some examples of the CompuServe services available:-

- Electronic Mail, Communications and Bulletin Board facilities
- Links to Internet with Internet mailbox
- CompuServe Support Forums with free support & updates provided by major software and hardware companies such as Lotus, Microsoft, IBM and Novell.
- News, Weather and Sports Services which is updated continually and access to Newspapers such as The Daily Telegraph, Guardian, Times etc.
- Travel services with updated information on Airline schedules and fares with flight booking option. Information also provided on world-wide hotel rates, Car Hire, AA information on accommodation in UK, and advice on Visas, Immigration etc.
- Electronic Shopping allows you to buy virtually anything
- Money Matters, Markets and Information Services with data on stocks, commodities and Money Markets. CompuServe's on-line brokerage facility allows you to buy and sell
- Entertainment and Games with access to many programs and multiplayer games.
- Research, Reference and Health with access to over 900 databases including services such as MEDLINE, and the complete Grolier's Academic Encyclopaedia.

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A scanner allows you to input printed graphics and text into your applications. Logitech hand held scanners provide a convenient way to scan images as graphics files and text into wordprocessors via OCR software (Optical Character Recognition Software).



### Scanman 256 Pack

**£5.50/Mth**

The Scanman 256 features 256 grey scales (mono) and Phototouch Windows software  
£19.58 deposit and 24 monthly payments of £5.50 Total £151.58 + VAT with IF systems only

### Scanman Colour Pack

**£13.00/Mth**

Scanman Colour offers 24-bit true colour scanning as well as 256 grey scales, Phototouch Colour and AutoStitch software £39.33 deposit and 24 monthly payments of £13.00 Total £351.33 + VAT

Tel: 01282 777 111. Fax No: 01282 770 701. All prices exclude delivery and VAT (17.5%). Interest Free Prices include delivery & VAT. Mainland Courier Delivery is £19 + VAT for systems and £15 + VAT for printers. Visa / Access / American Express / Switch, Government, Educational and Corporate orders welcome. Prices, specifications and offers are subject to change, availability, and subject to our conditions of sale copies of which are available on request. Mail order only. Goods are normally despatched within 7 to 10 days. All orders will be fulfilled within 28 days unless otherwise specified. All trademarks acknowledged. On hundred systems software applications are preloaded. Pack shots are shown for illustration only. Printed manuals and backup disks are available for a small extra charge. \*Interest Free Credit available subject to status. Written details are available on request. Be sure you can afford the payments before entering into a credit agreement. Interest free example shown on page 3. E&OE.

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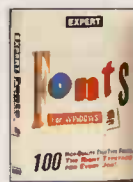
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The world's best windows game. As the Mayor and City Planner, you control the fate of countless cities where Sims move in and build hospitals, homes, stores & factories, or move out in search for something better. This great city simulator puts you in control and features superb animation and colour graphics.



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Expert 100 fonts for windows contains a selection of 100 Serif, Sans Serif and Display fonts that are fully scalable and will work with all your windows applications that support fonts and will enhance the output from these printers.



**Labels for Windows**  
Labels, envelopes and bar codes - all in one simple package that runs under windows and supports these windows printers. Choose from over 120 label formats or create your own in any size. A program that will be useful for all users.

## HP DeskJet 540 Pack

**£13.50** MTH INTEREST FREE CREDIT

£44.95 deposit and 24 monthly payments of £13.50.

Total price £299.00 + VAT = £368.95 Inc.

Delivery & VAT. APR 0%\*

The new HP Deskjet 540 600 x 300 dpi inkjet printer with flexibility of the option of upgrading to colour later on. Our Pack includes Deskjet 540 Printer with autosheet feeder, 3 year HP warranty, a shielded printer cable and the above software.

## HP Deskjet 540 Colour Pack

As above but with Colour kit included. £50.08 deposit and 24 monthly payments of £15.00

Total price £334.00 + VAT = £410.08

Inc Delivery & VAT. APR 0%.



## HP DeskJet 560C Pack

**£23.00** MTH INTEREST FREE CREDIT

£69 deposit and 24 monthly payments of £23.

Total price £513.51 + VAT = £621 Inc Delivery &

VAT. APR 0%\*

The high quality Colour Deskjet with resident black and colour cartridges for convenience.

## Epson Stylus Colour Pack

**£25.00** MTH INTEREST FREE CREDIT

£69.00 deposit and 24 monthly payments of

£25.00 Total price £554.36 + VAT = £669 Inc

Delivery & VAT. APR 0%.

The Epson Stylus Colour is the only colour inkjet to offer an amazing true 720 x 720 dpi resolution. This colour printer is simply superb, producing crisp text in solid black or colour. If you are looking for the best quality from your printer, this is the printer for you. Our includes Printer with autosheet feeder, 3 year Epson warranty, a shielded printer cable and the above software.



## NEC Laser Pack

**£19.00** MTH INTEREST FREE CREDIT

£53.95 deposit and 24 monthly payments of

£19.00 Total price £419.00 + VAT = £509.95

Inc. Delivery & VAT. APR 0%\*

The NEC SuperScript the first personal laser printer designed specifically for Windows. Incorporating leading technology in a simple, compact design, these are the first laser printers that are driven by PC's processor rather than their own. They offer ultra fast printing, with the first page printed faster than any conventional printer because of the PC-based GDI (Graphical Device Interface - which is Windows native language). Using resolution enhancement technology, these printers produce outstanding printer quality at a virtual 600dpi with solid blacks and fine half tones. Our packs include laser printer, a shielded printer cable, and the above software.





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### PROLINEA V3 (3 Slot/3 Bay)



- Processors from 33MHz 486 to 100MHz Pentium
- 4Mb, 8Mb or 16Mb RAM Upgradable
- Hard Disks from 200Mb to 720Mb
- 3.5" 1.44Mb FDD
- Enhanced Local Bus Graphics
- 102 key Keyboard and Mouse
- MS DOS 6.2, Windows 3.1
- 3 year Warranty (1st year on-site)

### PROLINEA V4 (4 Slot/4 Bay)



- Processors from 33MHz 486 to 100MHz Pentium
- 4Mb, 8Mb or 16Mb RAM Upgradable
- Hard Disks from 200Mb to 720Mb
- 3.5" 1.44Mb FDD
- Enhanced Local Bus Graphics
- 102 key Keyboard and Mouse
- MS DOS 6.2, Windows 3.1
- 3 year Warranty (1st year on-site)

### PROLINEA V5 (5 Slot/5 Bay)



- Processors from 33MHz 486 to 100MHz Pentium
- 4Mb, 8Mb or 16Mb RAM Upgradable
- Hard Disks from 200Mb to 720Mb
- 3.5" 1.44Mb FDD
- Enhanced Local Bus Graphics
- 102 key Keyboard and Mouse
- MS DOS 6.2, Windows 3.1
- 3 year Warranty (1st year on-site)

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|----------------|------|-----------------|-------|
| 4/33s M200W    | £635 | 4/66 M200W 8MB  | £899  |
| 4/33s M340W    | £695 | 4/66 M340W 8MB  | £969  |
| 4/50s M200W    | £689 | 4/66 M525W 8MB  | £1039 |
| 4/50s M340W    | £749 | 4/100 M200W     | £1039 |
| 4/50 M200W 8MB | £865 | 4/100 M340W     | £1099 |
| 4/50 M340W 8MB | £899 | 4/100 M525W 8MB | £1169 |

#### V3 (3-Slot/3Bay Family)

|                 |       |
|-----------------|-------|
| 4/50 M270W 4MB  | £745  |
| 4/66 M270W 8MB  | £965  |
| 4/66 M420W 8MB  | £1025 |
| 4/100 M270W 8MB | £1135 |
| 4/100 M420W 8MB | £1195 |
| 5/75 M270W 8MB  | £1265 |
| 5/75 M420W 8MB  | £1325 |

#### V4 (4-Slot/4Bay Family)

|                 |       |
|-----------------|-------|
| 4/66 M270W 8MB  | £995  |
| 4/66 M420W 8MB  | £1055 |
| 4/100 M270W 8MB | £1235 |
| 5/75 M420W 8MB  | £1365 |
| 5/90 M420W 8MB  | £1515 |
| 5/90 M570W 16MB | £1785 |

#### V5 (5-Slot/5Bay Family)

|                  |       |
|------------------|-------|
| 4/66 M270W 8MB   | £1039 |
| 4/66 M420W 8MB   | £1099 |
| 5/75 M420W 8MB   | £1399 |
| 5/90 M420W 8MB   | £1589 |
| 5/90 M420CDS 8MB | £1559 |
| 5/90 M720W 16MB  | £1759 |
| 5/100 M720W 16MB | £1829 |

#### Monitor Options

|                  |       |
|------------------|-------|
| 14" SVGA         | £210  |
| 14" Low Rad 1024 | £245  |
| 15" 151FS        | £350  |
| 17" 171FS        | £669  |
| QVision 172      | £819  |
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- MS Windows 3.1
- MS Works for Windows 3.0
- MS Money 3.0
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- Compaq Welcome, Control & Learning Centre
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|------------------------|------|
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| 8MB 32-bit memory card | £315 |

#### Models

|                 |       |
|-----------------|-------|
| 4/25 Model 170  | £799  |
| 4/25 Model 250  | £889  |
| 4/33C Model 170 | £1069 |
| 4/33C Model 250 | £1249 |

#### Docking Base

|                      |     |
|----------------------|-----|
| Convenience          | £60 |
| Mobile Port Expander | £25 |

### CONTURA 410



#### Upgrades

|                         |      |
|-------------------------|------|
| 4MB 32-bit memory card  | £169 |
| 8MB 32-bit memory card  | £329 |
| 16MB 32-bit memory card | £979 |

#### Models

|                 |       |
|-----------------|-------|
| 410 Model 250   | £1299 |
| 410C Model 350  | £1749 |
| 410CX Model 350 | £2279 |

#### Docking Base

|               |      |
|---------------|------|
| Standard      | £105 |
| With Ethernet | £175 |

### LTE ELITE



#### Upgrades

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|-------------------------|-------|
| 4MB 32-bit memory card  | £CALL |
| 8MB 32-bit memory card  | £CALL |
| 16MB 32-bit memory card | £CALL |

#### Models

|                    |       |                     |       |
|--------------------|-------|---------------------|-------|
| Elite 4/50E M250W  | £1939 | Elite 4/75CX M340W  | £3089 |
| Elite 4/40C M170W  | £1839 | Elite 4/75CX M510W  | £3299 |
| Elite 4/40CX M170W | £2089 | Elite 4/75CXL M510W | £3739 |
| Elite 4/40CX M340W | £2289 | Elite 4/75CXL M810W | £3999 |
| Elite 4/50CX M340W | £2749 |                     |       |



# TOSHIBA PORTABLES

ALTERNATIVES FOR TOSHIBA

## T2100



- Intel 50MHz 486 DX2
- 4Mb or 8Mb RAM Upgradable to 28Mb
- 260Mi.b or 350Mi.b HDD
- 3.5" 1.44 Floppy Disk Drive
- 10.4" VGA STN, 8.4" TFT Colour or 9.5" Mono Display
- PCMCIA Rel. 2.0

- Type II/III Slots
- 84 Key Keyboard, 12 Function Keys with Mousepoint
- MS DOS 6.22, MS Windows 3.11
- Up to 4 Hours per Charge
- Weight 3.1kg
- 1 Year Warranty

**T2100/260**  
**T2100CS/350**  
**T2100CT/350**

**£1015**  
**£1599**  
**£2199**

## T2150



- Intel 75MHz 486 DX4
- 4Mb or 8Mb RAM Upgradable to 28Mb
- 260Mi.b to 520Mi.b HDD
- External 3.5" 1.44 Floppy Disk Drive
- Double Speed CD ROM Drive
- 10.4" VGA STN or TFT Colour Display

- PCMCIA Rel. Type II/III Slots
- 84 Key Keyboard, 12 Function Keys with Mousepoint
- MS DOS 6.22, MS Windows for Workgroups 3.11
- Up to 3 Hours per Charge
- Weight 3.2kg
- 3 Years Warranty

**T2150CDS/260**  
**T2100CDS/350**  
**T2100CDT/520**

**£2279**  
**£2549**  
**£3399**

## T2450CT



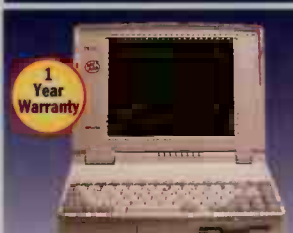
- Intel 75MHz 486DX4
- 8Mb RAM Upgradable to 32Mb
- 320Mb or 500Mb HDD
- 3.5" 1.44Mb FDD
- 9.5" VGA TFT Colour Display
- PCMCIA Rel. Type II/III Slots

- SCSI 2 Port
- 84 Key Keyboard, 12 Function Keys
- MS DOS 6.2, MS Windows for Workgroups 3.11
- Up to 3.5 Hours per Charge
- Weight 3kg
- 3 Years Warranty

**T2450CT/320**  
**T2450CT/500**

**£2849**  
**£3049**

## T1910



1 Year Warranty

- Intel 33MHz 486 SX
- 4Mb RAM Upgradable to 20Mb
- 200Mb HDD
- 3.5" 1.44Mb Floppy Disk Drive
- 9.5" VGA STN Mono or Colour Display
- PCMCIA Rel.2.0 Type II/III Slots
- 84 Key Keyboard, 12 Function Keys with Ballpoint Mouse
- MS DOS 6.2, Windows 3.11
- 3.5 Hours per Charge
- Weight 2.9kg

**T1910/200**  
**T1910CS/200**

**£839**  
**£1259**

## T1950CT



1 Year Warranty

- Intel 40MHz 486 DX2
- 4Mb RAM Upgradable to 20Mb
- 200Mb HDD
- 3.5" 1.44Mb Floppy Disk Drive
- 8.4" VGA TFT Colour Display
- PCMCIA Rel. 2.0 Type III Slot
- 84 Key Keyboard, 12 Function Keys with Ballpoint Mouse
- MS DOS 6.2, MS Windows 3.11
- Up to 4 Hours per Charge
- Weights 3.2kg

**T1950CT/200**

**£1689**

## T3600CT



3 Years Warranty

- Intel 50MHz 486 DX2
- 8Mb RAM Upgradable to 32Mb
- 250Mb HDD
- External 3.5" 1.44Mb Floppy Disk Drive
- 8.4" VGA TFT Colour Display
- PCMCIA Rel.2.0 Type II Slot
- 84 Key Keyboard, 12 Function Keys with Mousepoint
- MS DOS 6.2, MS Windows for Workgroups 3.11
- Up to 4.5 Hours per Charge
- Weight 2kg

**T3600CT/250**

**£2629**

## T4700



3 Years Warranty

- Intel 50MHz 486 DX2
- 8Mb RAM Upgradable to 40Mb
- 200Mb or 320Mb HDD
- 3.5" 1.44 Floppy Disk Drive
- 9.5" VGA TFT Colour Display
- PCMCIA Rel. 2.0 Type II/III Slots
- 84 Key Keyboard, 12 Function Keys with Ballpoint Mouse
- MS DOS 6.2, MS Windows for Workgroups 3.11
- MS Windows Sound System
- Up to 3.5 Hours Battery Life
- Weight 3.1kg

**T4700CT/200**  
**T4700CT/320**

**£2019**  
**£2189**

## T4850CT



3 Years Warranty

- Intel 75MHz 486 DX4
- 8Mb RAM Upgradable to 40Mb
- 500Mb HDD
- 3.5" 1.44Mb Floppy Disk Drive
- 10.4" VGA TFT Colour Display
- PCMCIA Rel. 2.0 Type II/III Slots
- 84 Key Keyboard, 12 Function Keys
- MS DOS 6.2, MS Windows for Workgroups 3.11
- MS Windows Sound System
- Up to 3.5 Hours per Charge
- Weight 3.2kg

**T4850CT/500**

**£3799**

## T4900CT



3 Years Warranty

- Intel 75MHz Pentium Processor
- 8Mb RAM Upgradable to 40Mb
- 810Mi.b HDD
- 3.5" 1.44Mb Floppy Disk Drive
- 10.4" VGA TFT Colour Display
- PCMCIA Rel. 2.0 Type II/III Slots
- 84 Key Keyboard, 12 Function keys and Ballpoint Mouse
- MS DOS 6.2, MS Windows for Workgroups 3.11
- MS Windows Sound System
- Up to 3 Hours per Charge
- Weight 3.1kg

**T4900CT/880**

**£4579**



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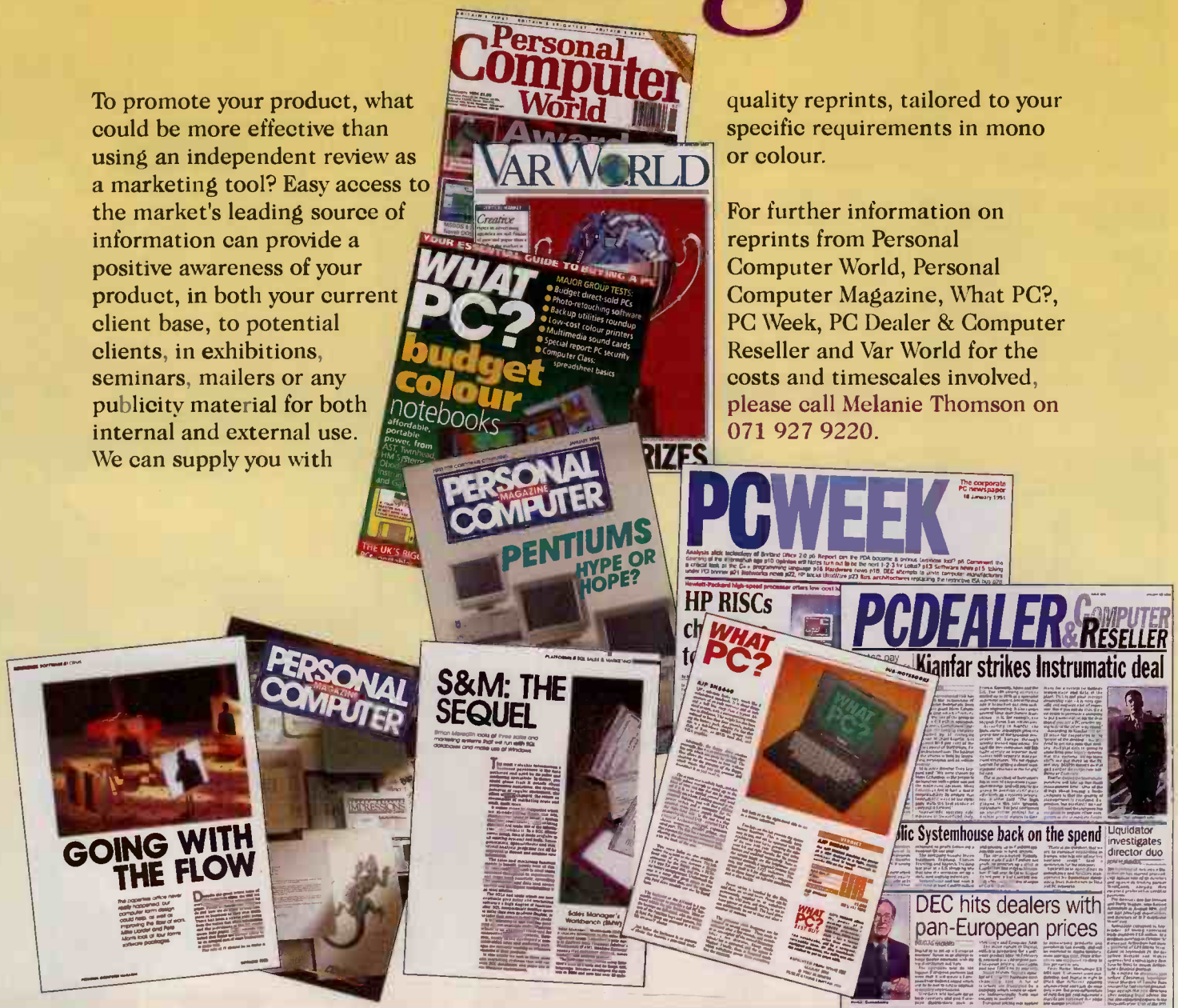


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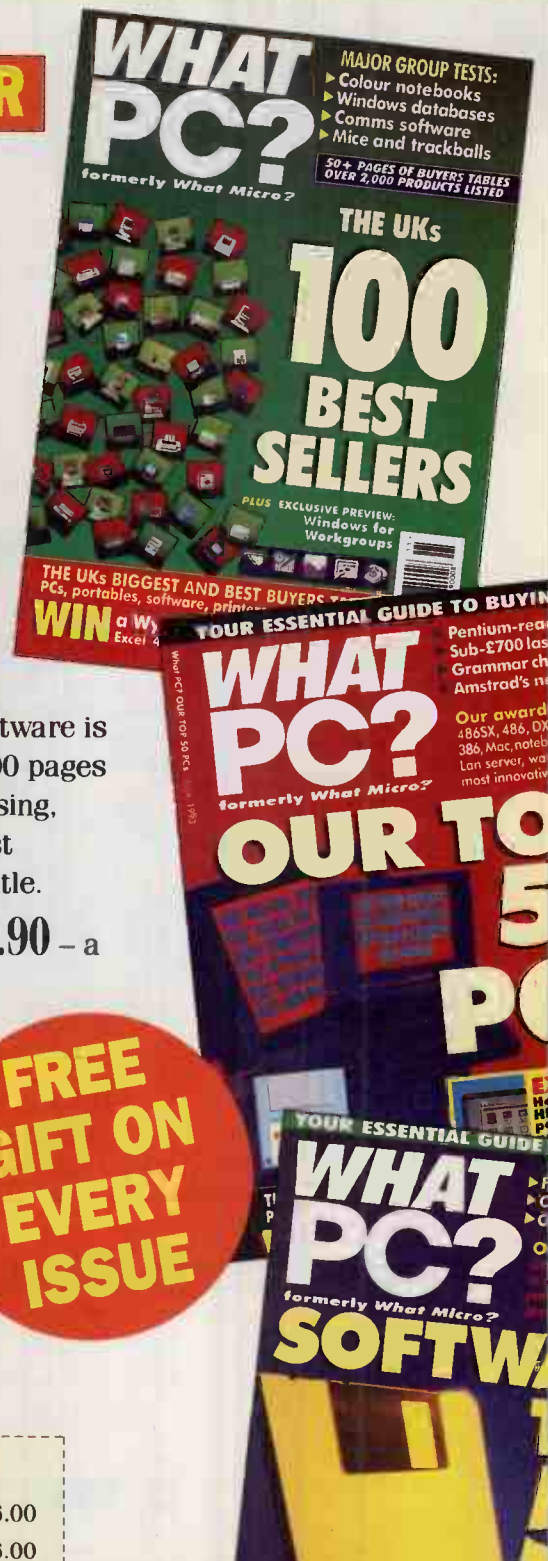
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# Bytewise Technology . . .



**Swift (PENTIUM)**

Intel Pentium Processor ● 256K Cache ● 8MB RAM 70ns upgradable to 128MB ● 528MB IDE Hard Disk ● IDE Controller Card with 2s, 1p & 1G Port ● 3.5" 1.44MB Floppy drive ● 1MB Cirrus Logic upgradable to 2MB Windows Accelerator SVGA Card ● 14" .28DP Super VGA Colour Monitor ● 102 Key Enhanced U.K Keyboard ● Microsoft Compatible Mouse ● Desktop or Minitower case with 2 x 5.25" & 2 x 3.5" Bays.  
MS-DOS 6.2 and Windows 3.11

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|-----------------------|-----------------|
| <b>Pentium 60MHz</b>  | <b>£1175.00</b> |
| <b>Pentium 66MHz</b>  | <b>£1195.00</b> |
| <b>Pentium 90MHz</b>  | <b>£1350.00</b> |
| <b>Pentium 100MHz</b> | <b>£1450.00</b> |



**Swift 486**

Intel 486 Processor ● 256K Cache ● 3 VL Bus ● 4MB RAM 70ns upgradable to 64MB ● 428MB IDE Hard Disk ● VLB IDE Controller Card with 2s, 1p & 1G Port ● 3.5" 1.44MB Floppy drive ● 1MB Cirrus Logic upgradable to 2MB Windows Accelerator SVGA VLB Card ● 14" .28DP Super VGA Colour Monitor ● 102 Key Enhanced U.K Keyboard ● Microsoft Compatible Mouse ● Desktop or Minitower case with 2 X 5.25" & 2 x 3.5" Bays.

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|-------------------|----------------|
| <b>486DX4-100</b> | <b>£820.00</b> |
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| <b>486DX2-66</b>  | <b>£700.00</b> |
| <b>486DX-50</b>   | <b>£800.00</b> |
| <b>486DX2-50</b>  | <b>£660.00</b> |
| <b>486DX-33</b>   | <b>£690.00</b> |
| <b>486SX2-50</b>  | <b>£650.00</b> |
| <b>486SX-33</b>   | <b>£650.00</b> |
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| Pentium 60MHz 256K Cache    | £350 |
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| 486SX-33 256k cache & VLB   | £120 |
| 486SX2-50 256k cache & VLB  | £120 |
| 486DX-33 256k cache & VLB   | £180 |
| 486DX2-50 256k cache & VLB  | £140 |
| 486DX-50 256k cache & VLB   | £255 |
| 486DX2-66 256k cache & VLB  | £180 |
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| 486DX4-100 256k cache & VLB | £250 |
| <b>486 PCI WITH CPU</b>     |      |
| ADD £40 TO THE ABOVE PRICES |      |

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| 386SX-40                       | £45 |
| 386DX-40 128k cache            | £70 |

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|               |      |
|---------------|------|
| 80486SX-25    | £50  |
| 80486SX-33    | £65  |
| 80486DX-33    | £115 |
| 80486DX2-50   | £90  |
| 80486DX-50    | £190 |
| 80486DX2-66   | £125 |
| Pentium 60MHz | £220 |
| Pentium 66MHz | £230 |
| Pentium 90MHz | £405 |

### MEMORY

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|------------------------|------|
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| 8MB RAM MODULE 72 PIN  | £220 |
| 16MB RAM MODULE 72 PIN | £340 |
| 32MB RAM MODULE 72 PIN | £695 |
| 4MB RAM MODULE 30 PIN  | £110 |
| 1MB RAM MODULE 30 PIN  | £28  |
| 256KB RAM              | £10  |

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|                   |      |
|-------------------|------|
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| Seagate IDE 260MB | £110 |
| Seagate IDE 428MB | £125 |
| Seagate IDE 545MB | £145 |
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| Seagate IDE 1.0GB | £285 |

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|                       |       |
|-----------------------|-------|
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| Seagate SCSI II 9.0GB | £2450 |
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|--------------------|------|
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### CASES WITH PSU

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|                             |     |
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| 622M Minitower with display | £38 |
| Miditower with display      | £74 |
| Large Tower                 | £92 |

### Delux range

|                            |     |
|----------------------------|-----|
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| KS130 Full Tower w/display | £96 |

### PSU

|                               |     |
|-------------------------------|-----|
| 200W for Minitower or Desktop | £26 |
| 230W for Minitower or Desktop | £45 |
| 250W for Big Tower            | £55 |
| 300W for Big Tower            | £60 |
| 250W Big L Type               | £60 |

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| VGA 512K 16-bit | £30 |
| VGA 1MB 16-bit  | £40 |

### CIRRUS LOGIC

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| Diamond stealth 64 2MB VRAM VLB PCI | £330 |
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|--|------|
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| Promise Cache controller               | £79  |
| Promise VLB Cache controller           | £115 |

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|                                |      |
|--------------------------------|------|
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**468SX-25**

**£820.00**

For other systems add £200.00

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|                            |      |                           |      |
|----------------------------|------|---------------------------|------|
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| NEC 3Xi Drive              | £260 | Soundblaster AWE 32 bit   | £195 |
| Orchid CD-ROM Drive        | £140 | Multi-Media Desktop Case  | £85  |



## Jet Black Systems & Parts

### SYSTEMS

For Swift systems in Black please add £70.00

### PARTS

|                   |      |                            |      |
|-------------------|------|----------------------------|------|
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| Black Minitower   | £69  | 1.2MB Teac                 | £42  |
| Black Large Tower | £126 | 14" Super VGA Colour       | £170 |
| Black Keyboard    | £26  | 14" Super VGA Colour NI/LR | £190 |
| Black Mouse       | £16  | Speakers                   | £20  |

**Swift 386DX-40 ● 4MB RAM ● 130MB HARD DISK ● 3.5" FLOPPY ● 14" SUPER VGA COLOUR MONITOR ● 102 KEYBOARD ● MOUSE £550.00**

**Swift 386SX-40 ● 2MB RAM ● 130MB HARD DISK ● 3.5" FLOPPY ● 14" SUPER VGA COLOUR MONITOR ● 102 KEYBOARD ● MOUSE £450.00**

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|---------------------|-----|
| 1.44MB 3.5" Epson   | £25 |
| 1.44MB 3.5" Teac    | £30 |
| 1.44MB 3.5" Sony    | £23 |
| 1.2MB 5.25" Teac    | £42 |
| 1.2MB 5.25" Sony    | £39 |
| 1.2MB 5.25" Mitsumi | £40 |

### MOUSE

|                         |     |
|-------------------------|-----|
| Mouse                   | £8  |
| Mouse and Pad           | £10 |
| Logitech Mouse Pilot II | £22 |
| Microsoft V2.0          | £25 |
| PS2 Mouse               | £20 |
| Logitech Cordless Mouse | £61 |

### SOFTWARE

|                            |      |
|----------------------------|------|
| MS-DOS 6.22                | £36  |
| Windows 3.11 FWG           | £55  |
| MS-DOS 6.22 & Windows 3.11 | £80  |
| Windows NT                 | £210 |
| Novel 4.1 5users           | £430 |
| Novel 4.1 10users          | £950 |
| Novel Personal Netware     | £48  |

### KEYBOARDS

|                             |     |
|-----------------------------|-----|
| AT 102 English              | £18 |
| PS2 102 Keyboard            | £25 |
| Mitsumi 102 Key Industrial  | £25 |
| Cherry G83                  | £30 |
| AT English + other language | £65 |

### MONITORS

|                         |      |
|-------------------------|------|
| 14" VGA Colour          | £136 |
| 14" Super VGA Colour    | £150 |
| 14" SVGA Colour LR      | £160 |
| 14" SVGA Colour NI & LR | £190 |
| 14" VGA Mono            | £75  |
| 15" SVGA NI/LR MPR II   | £255 |
| 17" SVGA NI/LR MPR II   | £530 |

### PHILIPS

|                         |      |
|-------------------------|------|
| 14" PHL 14A LR AUTOSCAN | £230 |
| 14" PHL 14C             | £190 |
| 15" PHL 15A LR          | £285 |
| 15" PHL 15B LR          | £275 |
| 17" PHL 17C             | £480 |
| 20" PHL 20C             | £820 |

### ACCESSORIES

|                         |     |
|-------------------------|-----|
| Keyboard adaptor to PS2 | £7  |
| Removable HDD Kit       | £15 |
| Heat sink with Fan      | £10 |
| Printer Cable           | £5  |
| SCSI Cable              | £10 |
| Laplink Cable           | £10 |
| 3.5" to 5.25" Adaptor   | £5  |

### PRINTERS

|                                  |      |
|----------------------------------|------|
| Samsung 9 pin                    | £99  |
| Samsung 24 pin                   | £139 |
| Samsung 24 pin colour + kit      | £175 |
| Panasonic KX-P1150 9 pin         | £105 |
| Panasonic KX-P2023 24 pin        | £130 |
| Panasonic KX-P2124 24 pin colour | £220 |
| HP Deskjet 540C                  | £210 |
| HP Deskjet 560C                  | £350 |
| Samsung SL1051A Laser Printer    | £360 |
| Samsung SL1082A Laser Printer    | £695 |
| Samsung SL1081P Laser Printer    | £875 |
| Panasonic KX-P4400 Laser         | £310 |
| Panasonic KX-P4440 Laser         | £760 |
| HP Laserjet 4L                   | £415 |
| HP Laserjet 4 Plus               | £980 |

### NETWORK CARDS

|                           |      |
|---------------------------|------|
| NE2000 16 Bit coax        | £30  |
| NE2000 10 Base T (UTP)    | £42  |
| <b>3 Com</b>              |      |
| 3 Com 3C509               | £76  |
| 3 Com 3C509 Combo         | £90  |
| 3 Com 3C579 32 Bit EISA   | £165 |
| <b>Novell</b>             |      |
| Eagle BNC                 | £65  |
| Eagle TP                  | £60  |
| Eagle Combo               | £70  |
| <b>Accessories</b>        |      |
| Boot ROM                  | £12  |
| BNC (Terminator)          | £3   |
| Ethernet Cables 3M W/BNC  | £10  |
| HUBS 8RJ45 + 1 BNC        | £167 |
| HUBS 12RJ45 + 1 BNC +1AUI | £265 |

### TAPE STREAMER

|                              |      |
|------------------------------|------|
| Jumbo 250MB                  | £105 |
| Jumbo 350MB                  | £120 |
| Jumbo 700MB                  | £195 |
| KE 10 External Kit           | £77  |
| Tracker 250MB External       | £210 |
| Tracker 350MB External       | £230 |
| Tracker 700MB External       | £310 |
| Exabyte DAT 2GB Drive        | £585 |
| Exabyte DAT 2GB Complete kit | £775 |
| Exabyte DAT 4GB Drive        | £695 |
| Exabyte DAT 4GB Complete kit | £815 |
| <b>Tapes</b>                 |      |
| DC 2060 120MB                | £12  |
| DC 6250 250MB                | £16  |
| DC 6525 525MB                | £19  |
| DL 9100 1.0GB                | £26  |
| DL 90 DAT 4MM 4.0GB          | £17  |
| DL 120 DAT 4MM 4.0GB         | £20  |
| DC 9120 PT25 Media 1.2Gb     | £34  |
| DC 9200 PT50 Media 2.0Gb     | £38  |

### FAX-MODEM CARDS

|                               |      |
|-------------------------------|------|
| 9600/2400 Fax-Modem BAPT Aprd | £60  |
| 14400 Fax-Modem internal      | £85  |
| Pocket Fax-Modem              | £90  |
| <b>US Rebotic</b>             |      |
| Sportster 14,400 Int          | £140 |
| Sportster 28,800 Ext          | £230 |
| World Port Dual Cellular      | £195 |
| Desktop Rapier                | £320 |
| Courier V 34 Ext              | £310 |

### PCMCIA

|                                 |      |
|---------------------------------|------|
| US Rebotic World Port Fax-Modem | £145 |
| US Rebotic Desktop Rapier       | £280 |
| Longshire 14.4K Fax-Modem       | £115 |
| Longshire 16Bit Ethernet BNC/TP | £95  |
| 3Com Ethernet Combo             | £179 |

### UPS

|                                    |      |
|------------------------------------|------|
| 425VA Mini Guard (Mini Tower Type) | £165 |
| 600VA Mini Guard (Mini Tower Type) | £195 |

**Delivery :**  
£15 for the Systems  
£10 for Cases or Monitors  
£4 for small Items

**Bytewise Technology Ltd**  
25 Downham Road, London N1 5AA



All prices exclude VAT and delivery



Page 1

## OPTIONS

### ALL INDI PRODUCTS ARE DELIVERED FREE OF CHARGE

Buying Mail Order is convenient and the prices are great. But sometimes it is important to actually see the product and take it away the same day. That's where our new Options scheme comes in. iNDi Mail Order or a visit to one of our Calculus Stores, the choice is yours. The same quality Service and with this Exclusive reader offer, Calculus will match any iNDi Mail Order price on the Spot. Add No Deposit Credit, nothing to pay for 6 Month or 0% finance plus a Trade in Deal\* on your old PC or Monitor we believe that this is the most exciting offer anywhere.

**No DEPOSIT, 0% INTEREST  
6 MONTHLY PAYMENTS\***

\* ON SELECTED PRODUCTS

**ON-SITE EXTENDED PC WARRANTY  
UPGRADE TO 2 YEARS UPGRADE TO 3 YEARS  
£99 Includes all parts and Labour £199**

### HYUNDAI 486 DX2-66 GREEN COMPUTING

This superb system has been awarded EPA certification with a power consumption of less than 30 W in sleep mode.. But that's just the beginning. Try to find a deal as good as this if you can - we tried - and failed.

- 486DX2-66 Mhz processor
  - 128K Cache
  - 270 Mb Hard Drive
  - 4Mb RAM (upgradable to 128 Mb - 72 pin 32 bit)
  - VESA Local Bus, SVGA Card
  - 1Mb VRAM with Cirrus Logic GD - 5428 upgradable to 2Mb.
  - 1 parallel, 2 serial, PS/2 mouse and keyboard ports.
  - 102 key keyboard and mouse
  - MS - DOS 6.2 and Windows for Workgroups 3.11
- 12 MONTHS ON SITE WARRANTY**

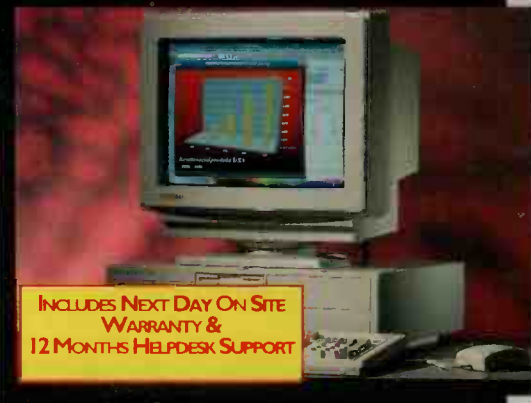
**No DEPOSIT 0% INTEREST  
\* 6 MONTHLY PAYMENTS**

ON ALL HYUNDAI PC SYSTEMS

**£639 + VAT**  
£750.82 inc VAT

**6 Monthly Payments of £125.14**

Now choose your monitor



**INCLUDES NEXT DAY ON SITE  
WARRANTY &  
12 MONTHS HELPDESK SUPPORT**

#### PROCESSOR & HARD DRIVE OPTIONS

**DX2-66 540Mb Hard Drive £679 £797.83 inc VAT**  
**4Mb to 8Mb RAM £129 £151.58 inc VAT**  
(configured price)

#### HYUNDAI 14" SUPER VGA NON INTERLACED MONITOR

- \* Clear 0.28 dp and high resolution 1024 x 768
- \* Non Glare dark face anti static
- \* Low emission complies with MPRII
- \* Ergonomic tilt and swivel stand

**£168**  
£197.40 inc Vat

#### PANASONIC TX-D1732 MULTI SCAN MONITOR

- \* 17" 0.28 dot pitch \* Low emission MPRII \* 1280 x 1024 high resolution (N.I./60Hz / max) \* High refresh rate 75Hz \* On screen menu displays \* Power saving function \* Digital Multi scan (Full Front Digital Controls \* Colour Temperature adjustment

**£508** £596.90 inc Vat

### HYUNDAI P60 PENTIUM PROCESSOR "QUAD DRIVE" MULTIMEDIA POWER SYSTEMS

**MULTI MEDIA** *Power Pack*  
TECHNOLOGY

This really is the ultimate Multimedia system. A superb Pentium, a State of the Art Quad Speed CD - ROM Drive, 16 bit sound card and a powerful 30 watts per channel Graphic Equaliser to give you top quality Stereo Sound. A real future proof investment at an extraordinary price plus our **BUY NOW PAY LATER OR 6 MONTHS 0% INTEREST DEAL**

#### PENTIUM P60 MULTI ENTERTAINMENT SYSTEM.

This system brings together a Hyundai P60 Pentium system and the following factory fitted option.

- \* NEC CDR - 272 Quad Speed CD ROM Drive \*
- \* PS5000 60 watt Graphic Equaliser \*
- \* JWP Classic Speakers
- \* 16 bit Soundblaster compatible sound card
- \* Frontier 8 CD Title software pack

**£1329**

£1561.60 inc VAT

**\* 6 Monthly Payments of  
£275.93 0% APR**

**No DEPOSIT 0% INTEREST  
6 MONTHLY PAYMENTS**

ON ALL HYUNDAI PC SYSTEMS

Now choose your monitor

#### MONITOR OPTIONS

Hyundai 14" SVGA **£168** ex VAT  
Panasonic TX-D1732 Multi Scan **£508** ex VAT

#### SYSTEM SPECIFICATION

- \* Microprocessor : Intel Pentium P60
- \* Cache: Level 1, 16 K. Level 2 256K upgradable to 1Mb
- \* RAM: 8Mb 32 - Bit, upgradable up to 192 Mb
- \* Storage: 1.44 Mb Floppy Disk
- \* Hard Drive: 540Mb
- \* Integrated Motherboard with 3 x PCI and 4 x ISA slots
- \* Video PCI Local Bus Video Card
- \* PCI IDE: Dual Connector (mode 3)
- \* 1 x parallel (25 Pin)
- \* 2 x Serial (9 - pin)
- \* EPA: Energy Star Compliant
- \* 1Mb Flash Bios
- \* CPU Heat sink and Cooling Fan
- \* 102 Key Keyboard and mouse
- \* Microsoft DOS 6.2 and Windows for Workgroups 3.11



**HYUNDAI P60**

**No DEPOSIT 0% INTEREST  
6 MONTHLY PAYMENTS**

ON ALL HYUNDAI PC SYSTEMS

**£999**

£1173.83 inc VAT

**\* 6 Monthly Payments of £195.64 0% APR**

#### \* NEED MORE INFO?

- \* NEC CDR -272 Quad Speed CD ROM + Software Page 4 of this advert
- \* PS5000 Graphic equaliser Page 2 of this advert

**ALL INDI PRODUCTS ARE DELIVERED FREE OF CHARGE**

\* Subject to Status

**MAIL ORDER SALES HOTLINE 01543 419999 FAX 01543 418079**

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## OPTIONS

Page 2

### ALL INDI PRODUCTS ARE DELIVERED FREE OF CHARGE

Turn your Hyundai PC into a fully fledged Multimedia System with the addition of any of the following Option packs. All factory fitted and quality controlled before delivery.

#### TRADE IN YOUR OLD PC OR GAMES COMPUTER

(ONLY AVAILABLE FROM CALCULUS STORES)

#### NO DEPOSIT, PAY NOTHING FOR 6 MONTHS\*

OPTION PACKS 1 AND 2 INCLUDE THE NEW FRONTIER SOFTWARE PACKS, UNDOUBTEDLY THE BEST QUALITY CD ROM PACK AVAILABLE WITH 8 CD TITLES WORTH ALMOST £400.



### FRONTIER

|   |               |
|---|---------------|
| <b>WORLD CUP GOLF</b><br>An amazingly accurate World Cup Golf Simulation                          | <b>£49.99</b> |
| <b>NOVASTORM</b><br>High flying 3D blast 'em up   | <b>£44.99</b> |
| <b>ECSTASTICA</b><br>A nightmare that you have not yet experienced                                | <b>£44.99</b> |
| <b>ALL NEW WORLD OF LEMMINGS</b><br>Larger Lemmings in crazy costumes                             | <b>£44.99</b> |
| <b>THE NEW DICTIONARY OF THE LIVING WORLD</b><br>A complete multi media guide to the Living world | <b>£44.99</b> |
| <b>VIRTUOSO</b><br>Welcome to the world of Imagination  | <b>£39.99</b> |
| <b>COMPTONS 95 INTERACTIVE ENCYCLOPEDIA</b><br>The Most powerful Educational tool available       | <b>£69.99</b> |
| <b>EXTRACTORS-</b><br>If you liked Diggers you'll love Extractors                                 | <b>£34.99</b> |
| <b>8 CD ROM TITLES WORTH £374.92 RRP</b>  |               |

THE PS-5000 EQUALISER AMPLIFIER IS FITTED AS STANDARD IN BOTH PENTIUM QUAD POWER SYSTEMS. IT CAN BE FITTED TO ANY PC PURCHASED FROM US, OR BOUGHT AS A SEPARATE ITEM.

#### 7 BAND CONTROL WITH DYNAMIC FILTERING FOR YOUR MULTIMEDIA PC

**SPECIFICATIONS:**  
 • Fits into any free 3.5" bay • Suitable for all IBM Compatible PC's • Can be connected to your sound card and / or CD - ROM drive • 60 watts (30 watts per channel) high quality stereo output • Designed with noise reduction (NR) and low distortion (LD) • 7 band control equaliser with Dynamic filtering that can select different bands of frequencies • Dos and Windows Multimedia software discs bundled free of charge • Adjustable volume control, on and off, the fader (balance) control all in one Knob. • 12 Months Warranty



The PS - 5000 is designed to be used with speakers that have a MINIMUM rating of 30 watts per channel. Using speakers rated at less than 30 watts may cause permanent damage

**Option 1 inc. Speakers**  
 A factory fitted PS - 5000 Equaliser Amplifier built into a Hyundai Multi Media System together with a pair of top quality 30 watts per channel stereo speakers, each with a separate woofer and tweeter. The ultimate Multimedia experience. Speaker size - 10" x 5.5" x 14"

**£108**  
 £126.90 inc VAT

IF YOU ALREADY OWN A PC, OPTION 1 & 2 CAN BE PURCHASED SEPARATELY

**Option 2**  
 A PS - 5000 Equaliser Amplifier complete with comprehensive fitting instructions

**£77**  
 £90.48 inc VAT

Speakers can be bought as a separate item  
 Speakers used in conjunction with the PS-5000 must be a minimum of 40 watts

**ALL INDI PRICES INCLUDE FREE SECURICOR DELIVERY**  
 BEFORE YOU BUY ELSEWHERE PLEASE CHECK FOR ANY HIDDEN COSTS

**CREATIVE**  
 CREATIVE LABS

|                           |                                |                        |                                |
|---------------------------|--------------------------------|------------------------|--------------------------------|
| 1. 3DO BLASTER            | <b>£299</b><br>£351.33 inc VAT | 4. AWE 32              | <b>£179</b><br>£210.33 inc VAT |
| 2. CD DISCOVERY 16        | <b>£230</b><br>£270.25 inc VAT | 5. GAME BLASTER CD     | <b>£229</b><br>£269.08 inc VAT |
| 3. SOUND BLASTER 16 VALUE | <b>£70</b><br>£82.25 inc VAT   | 6. CREATIVE 563 CD ROM | <b>£98</b><br>£115.15 inc VAT  |

**ALL INDI PRODUCTS ARE DELIVERED FREE OF CHARGE**

\* A copy of this advert is required to obtain our Mail Order Prices at a Calculus Store.  
 \* Trade in Deals are only available from Calculus Stores. Product must be complete and in full working order

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All trademarks are acknowledged. E&OE APR 29.8% Not all Calculus Stores carry the full range of advertised product. Please phone first to avoid disappointment.

### MULTIMEDIA 1

#### QUAD SPEED PACK

- \* NEC CDR - 272 Quad Speed CD ROM Drive
- \* CAPACITY - 656 Mb (Max Mode 1)
- \* DATA TRANSFER - 600 byte/sec (4x mode)  
- 150 byte/sec (1x mode)
- \* ACCESS TIME - 250ms (average)
- \* MTBF - 70,000hr
- \* INTERFACE - 40 - pin connector  
(Atapi protocol compatibility)
- \* COMPATIBILITY - High Sierra, ISO 9660, PhotoCD, Multisession, MPC Level 1, MPC Level 2, CD ROM XA, CD - DA, White book.

\* 16 - bit Stereo Soundcard \* Stereo speakers  
**PLUS THE NEW FRONTIER SOFTWARE BUNDLE OF 8 CD TITLES WORTH £374.92**  
**£239 + VAT**  
 £280.83 inc VAT  
**FACTORY FITTED**  
**£248 + VAT**  
 £291.41 inc VAT  
**STAND ALONE PRICE**

### MULTIMEDIA 2

- Dual Speed Multisession CD ROM MPC Compliant
- 300 Kb / sec transfer rate - 64 Kb buffer rate memory
- 16 - bit Stereo Soundcard
- Stereo speakers
- Multisession MPC compliant

**PLUS THE NEW FRONTIER SOFTWARE BUNDLE OF 8 CD TITLES WORTH £374.92**  
**£189 + VAT**  
 £222.08 inc VAT  
**FACTORY FITTED**  
**£198 + VAT**  
 £232.65 inc VAT  
**STAND ALONE PRICE**

### MULTIMEDIA 3

- Dual Speed Multisession CD ROM MPC Compliant
- 300 Kb / sec transfer rate - 64 Kb buffer rate memory
- 16 - bit Stereo Soundcard
- Stereo speakers
- Multisession MPC compliant
- COMPTONS INTERACTIVE ENCYCLOPEDIA
- MEGA RACE
- KINGS QUEST VI

**£149 + VAT**  
 £175.08 inc VAT  
**FACTORY FITTED**  
**£157 + VAT**  
 £184.48 inc VAT  
**STAND ALONE PRICE**

\* Subject to Status





# INDI

## DIRECT

# CALCULUS

## Stores

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# OPTIONS

**ALL INDI PRODUCTS ARE DELIVERED FREE OF CHARGE**

**COMMERCIAL LEASING AND ACCOUNT TERMS AVAILABLE**

(SUBJECT TO STATUS)

**No DEPOSIT, PAY NOTHING\*  
FOR 6 MONTHS**

**TRADE IN YOUR OLD PC/ GAMES COMPUTER  
(ONLY AVAILABLE FROM CALCULUS STORES)**

### CALIBRA NOTEBOOKS



### 486 DX 2 - 66 - MONO

The latest in the best selling Calibra range. The Calibra Swift DX2-66 is a top quality product complete with 12 months on-site warranty. With our irresistible BUY NOW PAY LATER deal this is an offer not to be missed. • 486 DX2-66 • 4Mb on board • Removable 250 Mb Hard Drive • PCMCIA type 3 x 1 • Built in Trackerball • 3.5" Floppy Drive • 128 Kb ROM, built in firmware: Bios / video / security / setup / power management • MS DOS 6.2 and Windows 3.11 • AC/DC adapter • Battery pack (operating time 2hrs / 3.5hrs with power management)

**£899**  
£1056.33 inc VAT

4Mb Memory Module **£190** ex Vat £223.25 inc Vat

### 486 DX 2 - 66 - COLOUR

• 32-bit Vesa Local Bus for VGA • 4Mb (20Mb max) - Removable 250 Mb Hard Drive • 128Kb ROM: built-in firmware • LCD Panel Display: 9.5" D-STN, 256 colours • Built in, front centred, 19mm Trackerball • 3.5" Floppy Drive • ACDC Adapter 30W, 100-240V • Battery pack: 4 hours (using Power Management) • 1x serial, 1x parallel, PS2 keyboard/mouse, VGA 1x PCMCIA Type 3 • MS DOS 6.22 and Windows 3.11 for workgroups.

Calibra Notebooks Price while Stocks Last

**£1349**

£1585.08 inc VAT

### NEW Canon BJ-200ex

The NEW BJ-200ex has print speeds of over 3ppm, it incorporates and in built 'smoothing' function giving and effective resolution of upto 720 x 360 dpi! At the faster speeds of 204cps HQ, and 248cps HS. The BJ-200ex still maintains the whisper quiet operation of 42 dBA, and of course the built-in 100 x A4 automatic sheetfeeder.

**£199** +VAT  
£233.83 inc VAT

### Canon BJC-600

\* Windows compatible \* Fast print speeds for colour and black \* Separate CMYK ink tanks \* 8 resident typefaces, 20 truetype fonts \* Prints on various media \* 1 Year Warranty

**£352** +VAT  
£413.60 inc VAT

### Canon Bubblejet Printers

#### Canon BJC-4000 - COLOUR

\* Colour desktop bubble jet with Separate CMYK ink tanks \* 360 DPI, 720 with black only \* 248 cps HS, 173 CPS HQ, (BC-20 opt.) 496 CPS HS, 346HQ \* Prints on media \* Built in Sheetfeeder \* Windows compatible \* 8 standard typefaces \* 1 year Canon Warranty

**ALL INDI PRODUCTS ARE DELIVERED FREE OF CHARGE** **£299** +VAT  
£351.33 inc VAT

### NEC Printer

#### NEC PINWRITER P2Q

New to the Calculus Printer Range the NEC P2Q takes 24 pin dot matrix technology to its limit offering a real cost effective solution to the home or small office user  
\* Flexible paper handling, bottom fed continuous, multipart cut sheet and envelopes \* 16K print buffer \* 96 CPS in letter mode and a superfast 192 CPS in draft mode. \* < 48dBA acoustic noise \* Paper Parking \* Manual Feed slot \* 12 Months on Site Warranty

**£106.37** ex VAT  
£124.99 inc VAT

### MICE

#### AM350 3-BUTTON SERIAL MOUSE

\* 3- Button Serial Mouse \* Mouse Driver and menumaker

**£17.50**

£20.56 inc VAT

#### AM380 3 - BUTTON SERIAL MOUSE

\* 3- Button Serial Mouse \* Mouse Driver and menumaker \* Mouse Pocket and Mouse Pad \* 9 to 25 pin adapter Also includes Photostacker for limited period JPEG image compression and capturing software for Windows

**£22.50**

£26.44 inc VAT

### Panasonic KX-P6100

#### LASER PRINTING

#### KX-P6100 6PPM GDI LASER PRINTER

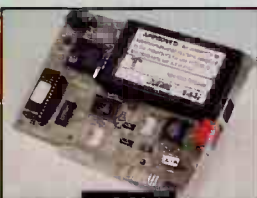
Dedicated to the windows users  
\* 6PPM-GDI-Graphic device interface \* 300 x 600DPI using EET (edge enhancement technology) \* Prints first page faster \* Small footprint (5.2"W x 14.9"D x 11.3"H) \* Silent standby inc power save \* 1 Year On-Site Warranty

**£307**

£360.73 inc VA

### SUPERFAST... DATA FAX MODEMS FROM £85

CHECK OUT THE SPECIFICATION OF OUR LATEST ADDITION YOU JUST WILL NOT BELIEVE YOUR EYES



V.32bis

\* V.32 bis/ V.17 Data/ Fax Modem Devices

**£85** ex VAT  
INTERNAL  
£99.88 inc VAT

\* 14,400 bps Data / Fax Connection Speed w/ Auto Fallback \* V.42 bis / MNP5, V.42 / MNP2 - 4 Compression & Error Correction (Effective throughput upto 57.6 Kbps) \* Enhanced Hayes AT Command Set & Class 2 Fax Command \* Data/ Fax Communications Software Package Included

**V.34 28,800 bps**  
INTERNAL MODEMS

\* Group 3 fax operation with class  
\* V42 error correction \* BABT approved  
\* Synch and Asynch operation  
\* Analog loopback, digital loopback, remote digital loopback  
\* Winfax lite/ DosFax Lite and CoMit Software  
COMPLETE WITH BT CABLE, MANUAL AND SOFTWARE

**185.00** £217 inc VAT



V.32bis

\* V.32 bis/ V.17 Data/ Fax PC Half Card Modem

**£96** ex VAT  
EXTERNAL  
£112.80 inc VAT

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# OPTIONS

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### QUAD SPEED DRIVES - TOMORROWS TECHNOLOGY

With all major software publishers producing new generation games and software applications requiring a minimum 600Kb data transfer per second, a Quad Speed drive is a must.

#### QUAD SPEED CD ROM SPECIFICATION

- \* NEC CDR - 272 Quad Speed CD ROM Drive
- \* CAPACITY - 656 Mb (Max Mode I)
- \* DATA TRANSFER - 600 byte /sec (4x mode) - 150 byte /sec (1x mode)
- \* ACCESS TIME - 250ms (average)
- \* MTBF - 70,000hr
- \* INTERFACE - 40 - pin connector (Atapi protocol compatibility)
- \* COMPATIBILITY - High Sierra, ISO 9660, PhotoCD, Multisession, MPC Level 1, MPC Level 2, CD ROM XA, CD - DA, White book.

**£189**

£222.08 inc Vat

#### INCLUDES 8 CD ROM TITLES WORTH £374.92 RRP

|                           |        |   |        |
|---------------------------|--------|---|--------|
| WORLD CUP GOLF            | £49.99 | THE NEW DICTIONARY OF THE LIVING WORLD  | £44.99 |
| NOVASTORM                 | £44.99 | VIRTUOSO                                | £39.99 |
| ECSTATIC                  | £44.99 | COMPTON'S 1995 INTERACTIVE ENCYCLOPEDIA | £69.99 |
| ALL NEW WORLD OF LEMMINGS | £44.99 | EXTRACTORS                              | £34.99 |

## Simply The Best

Technology moves on and there was a time when a "built - in" scan indicator was a real feature. Why? Because it told you when you were moving the scanner too fast. But of course it didn't prevent the missing lines. With our propriety MLC system missing lines are always automatically detected - MLC guarantees increased scanning speed and a better image. But that's not all, handheld scanners are typically smaller than the scanned image so scanned images need to be "stitched" together - hardly userfriendly and not easy to do. Our Exclusive "Magic stitch" function solves the problem bringing original images into vivid life.

#### VIEWSCAN 256 GREYSCALE SCANNER

- \* Line Art, halftone and greyscale 800 dpi (using software interpolation)
- \* Full 105 mm scanning width
- \* Scanning mode selected by hardware
- \* SPI & Twain compatible
- \* Installation software scantool
- \* Exclusive MLC (Missing Line Compensation) and magic stitch technology

#### PLUS

- photostacker: JPEG Image compression
- \* Image editing
- \* Special Image Effects
- \* Image Transform
- \* Painting & Drawing
- \* GO-CR OCR - Omnifont optical recognition software

**£69.00** £81.08 inc VAT

#### VIEW STATION A4 FLATBED SCANNER

- A superb 1200 dpi / 2400 dpi through interpolation system at a price taking full advantage of our bulk buying skills
- \* Scanning area - 8.5" x 14"
- \* Intelligent LCD panel status display
- \* SCSI II interface
- \* Line Art and 24 bit true colour (16.8 million colours)
- \* Long lasting cold cathode fluorescent lamp

**£439**

£515.87 inc VAT



#### VIEWSCAN 24 BIT COLOUR SCANNER

- \* All of the features of our greyscale scanner
- plus
- \* 16 million colour, colour scanning in true RGB 24 bit colour
- \* Scanning mode selected by software

#### Photostacker plus:

- \* JPEG Image compression
- \* Image editing
- \* Special Image Effects
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- \* GO-CR OCR - Omnifont optical recognition software

**£138**

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SHEET  
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ONLY

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**SCANfx** from BLACKWIDOW comes bundled with a 9800 fax/modem with a plug in and go installation so hand written to typed faxes can be sent just like an normal fax machine. A robust, but modern design suitable for both home or executive business environment. The bundled software inc: **MICROGRAFX** Picture publisher V4 one of the worlds top image processing/art packages and **WORDSCAN** V2. for your OCR work. The only low point with this device is the price at only £379 without modem and £449 with. This has to be one of the best £ for £ peripherals to hit the computer scene for some time.

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TRANSPARENCY  
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### FEATURES INCLUDE:

Resolution..... 400 x 1600 dpi (optical)  
4800 x 4800 dpi (Interpolated)  
Scan Modes..... 24-bit 16.7 million colours, 256 greyscale, half tone, etc.  
Scanning Area... 8.5" x 14" (max)  
Speed..... 35 sec (A4 at 400 dpi)  
Interface Card... Fast SCSI II (card supplied)  
Drivers..... TWAIN standard software interface.

NEW

ProSCAN 4800

\*Optional PhotoShop

Actual SCAN

TWAIN Compatible.



Price  
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Now with  
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New!

## TV Encoder PROFESSIONAL+

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Professional+ takes VGA

to TV / Video output to the final frontier. All display resolutions and colour modes are supported up to 800 x 600 lines in 16.7 million colours. Pin sharp, perfect quality simultaneous display on both TV and Monitor. Each and every function is controlled with its unique remote control handset making it a dream for presentation work! Features include: Screen Freeze, Pan and Zoom (enables you to present to large audiences) Brightness, Sharpness and auto mode detection which configures the display to different monitors and resolutions. It is truly a Plug-in and Go device requiring NO SOFTWARE drivers. The output quality surpasses any other encoder currently in our product range.

\*Bundled with famous award winning  
authoring software "ACTION"

### MAIN FEATURE LIST

- ◆ Supports 640 x 480 & 800 X 600 Modes.
- ◆ All colour modes up to 16.7 M.
- ◆ Full remote control of all working functions, inc. a configuration save.
- ◆ New generation flicker-free filter.
- ◆ Full Underscan & Overscan.
- ◆ TV brightness control.
- ◆ Horizontal and Vertical panning with Zoom feature.
- ◆ Screen Freeze, Unfreeze features.
- ◆ Extensive picture positioning/Attribute adjustment feature.
- ◆ Composite, SVHS, RGB (15KHz) and VGA (31KHz) outputs.
- ◆ P.S.U. 9V, 1A. (supplied.)

No other TV Encoder currently available in UK matches the performance and specification of TV Encoder Pro+.

New!

## TV Encoder VGA to TVVideo

This new entry level TV  
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compact, but it still packs a very big punch. Just like the Pro version it too will support all resolutions up to 800 x 600 and colour modes up to 64K, and again the quality is superb, almost as good as its big brother. The main difference is that you do require software drivers and there is no remote control.

This device will cater perfectly for those who would like near Pro results at a price that suits the pocket. Support is there for all outputs inc: Composite, SVHS & RGB along with VGA. Both our Encoders are suitable for Desktop and Notebook computers. Applications include: Business presentation, Education leisure and pleasure also excellent for large screen full action games play and will cost you a lot less than a large screen monitor!

### MAIN FEATURE LIST

- ◆ Supports 640 x 480 in 16.7M colours & 800 X 600 in 64K.
- ◆ TV brightness control from built-in switch.
- ◆ Software Positioning.
- ◆ New generation flicker-free filter for improved picture output to TV or Video.
- ◆ Underscan & Overscan function in software.
- ◆ Composite, SVHS, RGB (15KHz) and VGA (31KHz) outputs.
- ◆ P.S.U. 9V, 500mA. (supplied.)
- ◆ System required for both Encoders: Any VGA or SVGA IBM compatible, Desktop or Notebook.

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|-------------|-------------|-------------|-------------|-------------|-------------|
| Bareboard   | -           | <b>£110</b> | <b>£140</b> | <b>£140</b> | <b>£230</b> |
| Pentium-60  | <b>£190</b> | <b>£300</b> | <b>£335</b> | -           | -           |
| Pentium-66  | <b>£199</b> | <b>£309</b> | <b>£424</b> | -           | -           |
| Pentium-90  | <b>£375</b> | -           | -           | <b>£515</b> | <b>£605</b> |
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**PS5** Pentium board 5 ISA & 3 PCI slots, accepts Pentium 60/66 CPU. Award bios, cache from 256K to 1MB, up to 128 MB RAM on board, with Award BIOS.

**PCI54PV** Pentium board with PCI & VESA Local-Bus slots, accepts Pentium 75/90/100Mhz CPU. OPTI chipset, Plug & Play AMI BIOS, 256K cache up to 512K, up to 128MB RAM.

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**INTEL** Pentium board with 3x PCI & 5x ISA 16 Bit slots, accepts Pentium 90/100Mhz CPU. SMC Super I/O Controller on-board, PCI IDE auto-configuration, Bi-directional parallel, 2x RS232 ports, 256K cache, up to 128MB RAM on-board.



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| VESA Multi I/O + Mode 3 Enhanced IDE ..... | <b>£12</b> |
| VESA Multi I/O + Mode 4 Enhanced IDE ..... | <b>£29</b> |
| VESA High Perf. I/O, 16550 UART .....      | <b>£29</b> |
| PCI Multi I/O + Enhanced IDE + 16550 ..... | <b>£35</b> |

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| ISA 1542CF Fast SCSI controller kit.. | <b>£179</b>  |
| VESA SCSI .....                       | <b>£Call</b> |
| EISA SCSI Master kit .....            | <b>£279</b>  |
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## NETWORK CARDS



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## 486 MOTHERBOARDS

|            | Intel       | VLB-QOI     | VLB-PW4T    | PCI-P14     | VIP-TMC     |
|------------|-------------|-------------|-------------|-------------|-------------|
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| 486DX2-50  | <b>£59</b>  | <b>£118</b> | <b>£118</b> | <b>£135</b> | <b>£156</b> |
| 486DX-33   | <b>£76</b>  | <b>£135</b> | <b>£135</b> | <b>£152</b> | <b>£173</b> |
| 486DX2-50  | <b>£76</b>  | <b>£135</b> | <b>£135</b> | <b>£152</b> | <b>£173</b> |
| 486DX-50   | <b>£180</b> | <b>£239</b> | <b>£239</b> | <b>£256</b> | <b>£277</b> |
| 486DX2-66  | <b>£117</b> | <b>£176</b> | <b>£176</b> | <b>£193</b> | <b>£214</b> |
| 486DX4-100 | <b>£199</b> | <b>£258</b> | <b>£258</b> | <b>£275</b> | <b>£296</b> |

### AMD

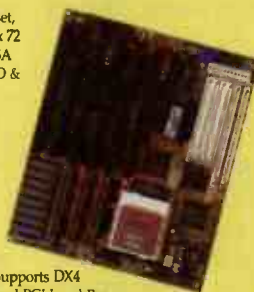
|            |             |             |             |             |             |
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| 486DX2-66  | <b>£85</b>  | <b>£144</b> | <b>£144</b> | <b>£161</b> | <b>£182</b> |
| 486DX2-80  | <b>£95</b>  | <b>£154</b> | <b>£154</b> | <b>£171</b> | <b>£192</b> |
| 486DX4-100 | <b>£135</b> | <b>£194</b> | <b>£194</b> | <b>£214</b> | <b>£232</b> |

**Q01** 2/3 Baby AT size board with 256K cache, OPTI chipset, AMI Win BIOS Flash ROM. Memory 4x 30 pin & 2x 72 pin SIMM slots supports up to 64MB. 3x VESA, 6x ISA 16 Bit, 1x 8 expansion slots. Supports DX4 Intel, AMD & Cyrix CPU, Green Functions.

**PW4T** 2/3 Baby AT size board with 256K cache, Winbond chipset, AMI BIOS, Memory 4x 30 pin & 2x 72 pin SIMM slots supports up to 64MB. 3x VESA (2x VESA Local-Bus Masters) 6x ISA 16 Bit, 1x 8 Bit expansion slots. Supports DX4 Intel, AMD & Cyrix CPU, Green Functions.

**P14** 2/3 Baby AT size board with 256K cache, AMI BIOS, Memory 4x 72 pin SIMM slots supports up to 128MB. 3x PCI 32 Bit, 4x ISA 16 Bit expansion slots. Supports DX4 Intel, AMD & Cyrix CPU, Green Functions. 2x on-board PCI Local-Bus Enhanced IDE controllers.

**TP1** 4/5 Baby AT size board with 256K cache, OPTI chipset, AMI Win BIOS. Memory 4x 72 Pin SIMM slots supports up to 128MB. 3x PCI 32 Bit, 2x VESA, 5x ISA 16 Bit expansion slots. Supports DX4 Intel, AMD, Cyrix CPU. On-board PCI Local-Bus Enhanced IDE & Floppy controller. 2x RS232 (16550), 1x Parallel (ECP, EPP) ports.



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Small text at the bottom of the page.



# Accounting for Profit and Growth!

**"When asked what advice to give others, the reply was to ignore the £99 price as it gives the wrong indication of the size, power, flexibility, sophistication and state-of-the-art design."**

TAS Books was the accounting software sensation of last year. More than 20,000 businesses have now bought TAS Books. When subsequently asked what the main benefits were, they reported **increased profits, increased sales whilst keeping costs down, increased productivity, better communication with their customers, improved cash-flow and a better image for their companies.** And these are just some of the main benefits that TAS Books gave them!

Many had used other accounting software such as Quicken, Sage, Pegasus or Multisoft and confirmed that computerised book-keeping with TAS Books was easier; that it was capable of handling massive files, running on networks with vital record locking controls rather than file locking\* and, once implemented, put them in **total control of their business finances; running their accounts as a professional accountant would.**

Many confirmed that there was really no such thing as a "small business" accounting system. "Small business" usually meant "big compromise" and they complimented Megatech on how elegantly TAS Books supports all financial events that happen in business without the need to compromise.

The conclusion is that **TAS Books can save you thousands of pounds in office administration costs and increased efficiency, so you and your staff can spend more time making your business grow.**

So how revolutionary is it? How easy is it to use? Is it suitable for your business... and how soon can you benefit from it? These are just a few of the considerations that these 20,000+ businesses asked themselves when they originally tried TAS Books.

\* Many so called "multi-user" or "network" versions of accounting software do primitive file locking rather than record locking. File locking means that if, for example, you want to print a stock valuation report, the complete stock file is locked and another user cannot access the file, i.e. no orders can be entered! TAS Books is based on Btrieve® and has sophisticated record locking which means that only individual records are locked, and only when being updated, not whilst being read to produce a report. This is particularly important if you want to run on a network (this maybe at a later date) or run under Windows or Workgroups.

## Revolutionary "Account Processor"

Users simply fell in love with TAS Books' revolutionary "Account Processor" concept. Normally, if you make a mistake in accounting, you cannot amend the error. You have to journal and reverse the transaction and re-enter it completely from scratch.

With TAS Books, a transaction can be changed or deleted as in a word processor or spreadsheet. Your accounts now reflect the true state of your business, accurately tying in with the source documents like invoices, payments and receipts.

Whilst this feature should be used with care (it's under password control and has a full audit trail) users have found it so useful, they claimed it was hard to imagine life without it.

## Quick to Learn and Easy to Use

When you try TAS Books, the installation copies a complete set of tutorial data to your hard disk. This will show you step-by-step how to build a set of accounts and run a company's finances.

You're then ready to get your own accounts up and running with a minimum of fuss and disruption, safe in the knowledge that, because of the "Account Processor" concept, any mistakes can be easily and quickly put right.

Users regularly make compliments on the clarity and value of this tutorial. Many said this part of the package alone is worth more than the price of the software. Even chartered accountants said that the explanation of double entry bookkeeping in the tutorial is the best they had ever seen!

## And there's help when you need it

Besides the superb tutorial and on-line help facilities, you get a 400+ page fully-indexed reference manual. But computing and accounting are probably not your main line of business and some users reported a distinct fear of computers.

This was soon overcome by Megatech's friendly, professional help through a direct telephone help desk which answers questions and sorts out any problems you may have.

With that security even the most technophobic user can quickly become an expert with TAS Books.

This technical support is free during the first three months and thereafter can be subscribed to at low cost which includes updates to the accounting software.

## Is it suitable for you?

As said before, there is really no such thing as a "small business". It's all book-keeping. Users include service companies, electrical distributors, catering and building companies, photographers, software distributors and more. Besides the ledgers, the system includes a full order processing and invoicing module suitable for service companies and small manufacturers and distributors.

TAS Books 2 includes full stock control, dual purchase order processing with part delivery support and sales order processing with back-orders.

**When it comes to meeting your bank manager, he will be impressed with the quality of your accounts and the demonstrable control you have over your business finances!**

If you haven't computerised your business before, you can start with the £99 package first. This provides full financial ledgers and high-speed order processing and invoicing. When implemented, you can then upgrade to TAS Books 2 and add TAS Payroll at any time.

## Double Entry an Asset for Life

If Megatech have a mission in life, it is to teach you proper double entry book-keeping. When people say it's difficult, they are really saying they don't understand it and have probably never even tried to understand it.

Many users and accountants have reported that the explanation of double entry bookkeeping in the tutorial is the best they've ever seen!

By working through the tutorial you will learn how a Profit & Loss works and how it inter-relates with the Balance Sheet. After all, your business accounts are, in essence, no different from a corporate set of accounts and, once understood, you will have acquired an asset for life!

| 30/1/94                           |  | The TAS Books Training Company |  | Page: 1                        |  |
|-----------------------------------|--|--------------------------------|--|--------------------------------|--|
| Profit & Loss Statement           |  | Current                        |  | May-94                         |  |
| SALES                             |  | 30/1/94                        |  | The TAS Books Training Company |  |
| 3200-100 Sales Income             |  | 546877.0                       |  | Balance Sheet                  |  |
| 3490-100 Shipping & Postage       |  | 15342.2                        |  | Current                        |  |
| Total Sales Income                |  | 562219.2                       |  | May-94                         |  |
| COST OF SALES                     |  | 30/1/94                        |  | The TAS Books Training Company |  |
| 3600-100 Cost of Sales            |  | 181832.6                       |  | Balance Sheet                  |  |
| 3620-100 Agency Margin            |  | 25069.5                        |  | Current                        |  |
| Total Cost of Sales               |  | 206902.1                       |  | May-94                         |  |
| GROSS MARGIN                      |  | 30/1/94                        |  | The TAS Books Training Company |  |
| Sales Less Cost of Sales          |  | 375317.1                       |  | Balance Sheet                  |  |
| OPERATING EXPENSES                |  | 30/1/94                        |  | Current                        |  |
| 4110-100 Interest-Lending & Prod  |  | 12205.4                        |  | May-94                         |  |
| 4130-100 Commission/Printing      |  | 12517.4                        |  | The TAS Books Training Company |  |
| 4150-100 Postage/Travelling Exp   |  | 1156.1                         |  | Balance Sheet                  |  |
| 4170-100 Telephone/Telex Fax      |  | 4644.9                         |  | Current                        |  |
| 4200-100 Office Rent/Services     |  | 137.6                          |  | May-94                         |  |
| 4300-100 Freight In & Duty        |  | 2993.3                         |  | The TAS Books Training Company |  |
| 4320-100 Depreciation Charges     |  | 18752.3                        |  | Balance Sheet                  |  |
| 4400-100 Contract Staff Chgs      |  | 24773.3                        |  | Current                        |  |
| 4420-100 Rent & Repairs           |  | 11873.2                        |  | May-94                         |  |
| 4440-100 Insurance                |  | 4571.7                         |  | The TAS Books Training Company |  |
| 4460-100 Gas Water Electric Rates |  | 4509.2                         |  | Balance Sheet                  |  |
| 4480-100 Other Office Expenses    |  | 5322.4                         |  | Current                        |  |
| 4500-100 Office Maintenance       |  | 2019.2                         |  | May-94                         |  |
| 4520-100 Other Office Expenses    |  | 1191.2                         |  | The TAS Books Training Company |  |
| 4540-100 Other Office Expenses    |  | 1772.2                         |  | Balance Sheet                  |  |
| 4560-100 Subscriptions & Refs     |  | 1627.8                         |  | Current                        |  |
| 4580-100 Other Office Expenses    |  | 1627.8                         |  | May-94                         |  |
| 4600-100 Depreciation Charges     |  | 5030.0                         |  | The TAS Books Training Company |  |
| 4620-100 Other Office Expenses    |  | 2154.2                         |  | Balance Sheet                  |  |
| 4640-100 Other Office Expenses    |  | 4500.0                         |  | Current                        |  |
| 4660-100 Other Office Expenses    |  | 1509.0                         |  | May-94                         |  |
| 4680-100 Other Office Expenses    |  | 2478.0                         |  | The TAS Books Training Company |  |
| 4700-100 Other Office Expenses    |  | 5478.0                         |  | Balance Sheet                  |  |
| 4720-100 Other Office Expenses    |  | 2478.0                         |  | Current                        |  |
| 4740-100 Other Office Expenses    |  | 2478.0                         |  | May-94                         |  |
| 4760-100 Other Office Expenses    |  | 2478.0                         |  | The TAS Books Training Company |  |
| 4780-100 Other Office Expenses    |  | 2478.0                         |  | Balance Sheet                  |  |
| 4800-100 Other Office Expenses    |  | 2478.0                         |  | Current                        |  |
| 4820-100 Other Office Expenses    |  | 2478.0                         |  | May-94                         |  |
| 4840-100 Other Office Expenses    |  | 2478.0                         |  | The TAS Books Training Company |  |
| 4860-100 Other Office Expenses    |  | 2478.0                         |  | Balance Sheet                  |  |
| 4880-100 Other Office Expenses    |  | 2478.0                         |  | Current                        |  |
| 4900-100 Other Office Expenses    |  | 2478.0                         |  | May-94                         |  |
| 4920-100 Other Office Expenses    |  | 2478.0                         |  | The TAS Books Training Company |  |
| 4940-100 Other Office Expenses    |  | 2478.0                         |  | Balance Sheet                  |  |
| 4960-100 Other Office Expenses    |  | 2478.0                         |  | Current                        |  |
| 4980-100 Other Office Expenses    |  | 2478.0                         |  | May-94                         |  |
| 5000-100 Other Office Expenses    |  | 2478.0                         |  | The TAS Books Training Company |  |
| Total Operating Expenses          |  | 24780.0                        |  | Balance Sheet                  |  |
| PROFIT (LOSS)                     |  | 350537.1                       |  | Current                        |  |
| Net Profit (Loss)                 |  | 60                             |  | May-94                         |  |

Flexible, script-based, high-speed report generator reports over multiple periods in 1 to 13 columns. Creates management accounts, Balance Sheet, Profit & Loss Statement and Supporting Schedules. In seconds!



# TAS BOOKS Account Processor™

## Nominal Ledger

- Complete system supports both 12 (monthly) or 13 (variable) accounting periods.
- On-screen nominal account enquiries with full drill-down to individual double entry gives exceptional auditability.
- 6 Digit account number and 3 alpha department code for a virtually unlimited number of cost or profit centres and any number of income and expense accounts.
- Journals may have up to 250 lines with full WP-like editing facilities.
- Both recurring and reversing journals are fully supported.
- Unlimited detail and up to three year's summary totals are kept for all accounts.
- Current and next year's budget can be defined down to single months/periods.
- Instant Trial Balance for any period from one month to a whole year up to 2 years ago!
- High-speed, script-based report generator for financial statements and supporting schedules. Balance Sheet and Profit & Loss Statement scripts already included.
- Financial statements print in 1-4 column and 12-13 column formats each with percentage ratio calculations.
- All reports can be sent to screen, printer or disk for editing with any WP package.

## Sales Ledger

- No less than 5 screens show the record details incl. credit card details and instant profit/margin trend analysis. Customers can also be suppliers.
- On-screen customer account enquiries with full drill-down to individual invoice lines, payment details and double entry.
- Aged debt report helps you keep a check on who owes you money. It automatically checks oldest unpaid invoice and puts the customer on credit hold if excessively overdue.
- Comprehensive reporting includes daybooks, unallocated cash report, statements and numerous customer and sales analysis reports.
- Mailing labels, mail-merge file.
- 4 Automatic levels of overdue account letters help you get the money in quickly.
- Full open item accounting with unlimited transaction detail.
- Meaningful alpha customer code (short-name) for easy retrieval.
- Recurring (monthly) transactions are fully supported. Recurring transactions may be added and posted at any time.
- Payments can be allocated from easy on-screen list. Simply highlight the invoice to be allocated with up and down-arrow etc.
- Payments can be retrieved and the invoices un-allocated.

## Purchase Ledger

- On-screen supplier account enquiries with full drill-down of invoices, discounts, payment details and double entry.
- Report on any period from a single-day up to whole years on all transactions.
- Easy payment of supplier invoices with automated invoice selection, full remittance advice and cheque printing.
- Payments and discounts can also be allocated from easy on-screen list. Simply highlight the invoice to be allocated with up and down-arrow etc.
- Payment and settlement discount history is kept, so if mistakes are made, payments can be retrieved and the invoices un-allocated.
- Comprehensive reporting includes purchase and cash daybooks, aged invoice report, unallocated cash report and numerous supplier related reports. As with S/L, it has full open item accounting with unlimited transaction detail.
- Allocate each P/L entry to as many as 250 different expense accounts and departments.
- If mistakes were made (access permitting) all P/L entries may be retrieved, corrected and re-saved.
- Recurring (monthly) transactions are fully supported and may be added and posted at any time.

## Cashbook

- Instantly display cash/bank balance (what you have) and statement balance (what the bank thinks you have).
- Supports up to 9 bank accounts, each with high-speed reconciliation and inter-bank transfers. Remember, if your bank reconciles you know the money is right. Everything else is simply allocation and can be corrected at any time.
- Cash books are fully integrated and automatically updated by sales and purchase ledger entries.
- Supports cash receipts/sales and payments/purchases, (monthly) recurring receipts and payments incl. direct debits and standing orders.
- Allocate each entry to up to 250 different income or expense accounts and departments.
- Supports multiple VAT rates for both Standard as well as Cash Accounting scheme.
- Fully supports non-VAT related payments such as salaries, Customs & Excise, insurance, loans etc.
- If mistakes are made (access permitting), cashbook entries may be retrieved and descriptions, amounts and expense accounts etc. corrected and re-saved.
- Daybooks from 1 day up to 3 years ago. Can be sent to screen, disk or printer.

## Sales Invoicing

- Fully integrated with sales ledger customers, settlement discounts, nominal ledger etc.
- High-speed order entry allows for Quotation to Pro-Forma to Packing Slip to Invoice and back to Credit Note cycle.
- 4 Superb Sales Analysis Reports by Product, by Category, by Customer and by (multiple) Periods.
- Supports both product code based stock items as well as free format text paragraphs.
- Network version has sophisticated record locking. Other systems have file locking which means that if you run a stock report, you cannot enter orders!
- Supports one-level parts explosion where an assembly may consist of up to 50 other parts.
- Design your own (multiple) formats for Quotations, Pro-Forms, Packing Slips and Invoices / Credit Notes etc.
- System will "remember" settlement discounts as well as line discounts.
- Special "dynamic discount" for each customer/product combination.
- Invoices can be reprinted and invoice line item history can be kept for S/L account enquiries for unlimited periods.
- System checks both credit limit and credit hold flag which is set automatically by the aged invoice report.

## All awards worth winning...



**Best Financial Software Company - PC Today.** "...they were just shaded by Megatech, whose accounts package TAS Books remains the best value solution for business." - March 1994.



**Editor's Choice - Personal Computer World.** "The others will have to go a long way and become a lot cheaper before they better TAS Books." - Personal Computer World, October 1993.



**Best DOS Program, Accounting Section - What PC?** "An excellent all-round accounting system, with a very rare feature for accounts software - a comprehensive tutorial." - August 1993.



**Best Value Business Software - PC Today.** "With emphasis on value for money and ease of use, TAS Books struck the judges as the program that represented the best overall value to business." - April 1993.



**Best Accounting Software - What PC?** "An excellent all round accounts package with a very comprehensive tutorial. 5 Out of 5 for ease of use, functionality, documentation and value for money." - May 1993.



**Editor's Choice - PC Magazine.** "For the small business or individual, TAS Books takes the honours... Indisputably the best value for money." - PC Magazine, January 1993.

**Recommended by the ICAEW.** TAS Books, the first budget priced accounting system to receive formal recommendation of the Institute of Chartered Accountants in England and Wales. - June 1992.

**Try it today! Special Offer for just £99 with "No Risk" 90-Day Money Back Guarantee !**

## And here's what existing users say...

- "I have never been as impressed with a company and its products .... good value for money ....does the job extremely well ....makes accounting easy for the layman to understand. TAS has, in some cases, more power than products costing several thousands of pounds." LH, Derby.
- "TAS Books has performed superbly ... enhanced our professional image ... and enabled the company to expand." IM, London W4.
- "TAS Books literally saved my business." DHG, Cambridge.
- "Being new to computers, I had expected the transition from a manual system to be difficult. The system and excellent manuals made it a quite painless process." RS, Newcastle-under-Lyme, Staffs.
- "As a chartered accountant, I must congratulate you on a superb product. Your competitors have inferior products selling at several times the price." RJP, Slough, Berks
- "I must compliment you on your product. I am Finance Director of one of the country's biggest retailers and have experience of numerous accounting packages. In terms of value for money, the functionality of TAS Books is incredible." PGM, Leicestershire.
- "A superb system ... my accounts have never seemed easier nor more professional. Anyone want to buy a three-month old Sage System?" RDW, Devon.

## Try TAS Books for 90 days risk free

We have saved the best news till last. TAS Books is currently available at a "Special Offer" price of just £99 single-user or £199 multi-user. **This is not a cut-down version.** You get the complete package as shown in the picture. It is fully operational and includes 3 months technical telephone support! And Megatech would like you to try it, so it backs the package with a unique **90-day money back guarantee.** If you like it you keep it. If not, you simply send all of it back and your purchase price will be refunded (less £10.58 shipping). Immediately!

There is no risk, so telephone or fax your order today. Credit cards are accepted and orders received by 2.30pm are shipped the same day so you can try it tomorrow!

## Will it run under Windows?

TAS Books is an easy-to-use Dos application. It runs on any PC with a hard disk. It includes 3.5" floppy disks with 5.25" disks available on request. It works great under Windows and includes an Icon and PIF file. The multi-user version allows you to run multiple tasks concurrently and can be used to demonstrate the sophisticated multi-user record locking mechanism.

## VAT is handled automatically

All VAT is handled automatically including EC VAT. At the end of the period simply run the VAT 100 report. Both the Standard VAT and the VAT Cash Accounting schemes are fully supported. If you are not VAT registered, you can simply ignore it. TAS Books has been inspected by the VAT office. The dual VAT Registers as well as the audit trail remain on disk. This allows you to re-run the audit trail and all the VAT reports as and when required.

## Try it tomorrow... telephone or fax...

In UK: MEGATECH Software:  
Tel: 081-874 6511 - Fax: 081-877 1384

In Eire: MEGATECH Software (Irl) Ltd  
Tel: 01-855 1033 - Fax: 01-855 1035

In Australia: MEGATECH Software Pty Ltd:  
Tel: 02-823 3017 - Fax: 02-823 3017

The Australian version fully supports Australian sales tax and credits. Note that prices quoted apply to UK mainland only and non-UK versions vary in price.

TAS Books is a product recommended by the Institute of Chartered Accountants in England and Wales. However, any agreement made in respect of the product or for the purchase of related services shall be made between the member and the supplier, and the Institute shall not be a party thereto and cannot therefore be responsible for loss or damage occasioned by the use of the product or related services. For this reason, members should satisfy themselves that the products or services fulfil their own standards or requirements and should not rely merely on the recommendation of the Institute.



|  |      |                                    |
|--|------|------------------------------------|
| TAS BOOKS, Single-User/Single Company: | (SU) | Special Offer Price £ 99 (£126.91) |
| TAS BOOKS, Multi-User LAN Version:     | (MU) | Special Offer Price £199 (£244.41) |
| TAS BOOKS, Multi-Books Extension add:  | (MB) | Special Offer Price £ 50 (£ 58.75) |

The Multi-Books Extension allows the programs to be shared by different companies and is perfect for a book-keeping service. Upgrade at any time for the price difference. Prices in brackets include VAT, overnight UK mainland shipping and 3 months telephone support. TAS Books 2 has full Sales and Purchase Order Processing integrated with Stock Control. TAS Payroll fully integrates with TAS Books 1 and 2.

- Order by Phone:** Telephone 081 - 874 6511 quoting this magazine and your credit card details.
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- 1 - All orders received by 2.30pm will be sent next-day delivery on the same day your order is received.
- 2 - Please help to make the advertising more efficient and quote the name of this magazine if applicable.

I understand that I can return the complete product, within 90 days, in good condition and in its original packaging for a full refund of my purchase price, less £10.58 shipping and handling. On that basis please supply a copy of TAS Books, (SU/MU/MB) Version: @ £ (incl. shipping and VAT).

## Credit Card Information

Number: \_\_\_\_\_  
Expiry Date: \_\_\_\_\_  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Postcode: \_\_\_\_\_  
Tel: \_\_\_\_\_  
Signature: \_\_\_\_\_

## Invoice / Company Information

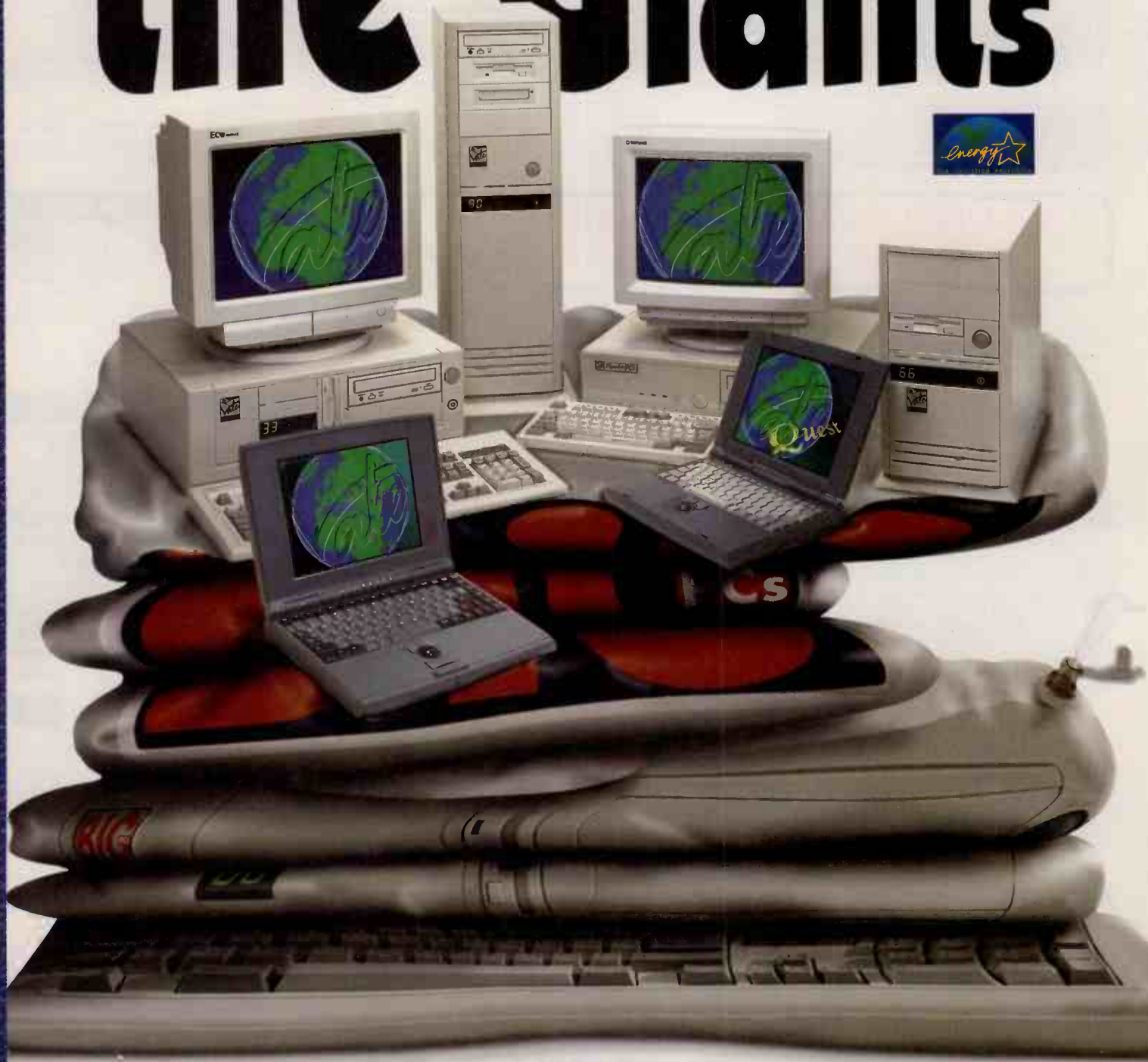
Name: \_\_\_\_\_  
Contact: \_\_\_\_\_  
Address: \_\_\_\_\_  
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Magazine: \_\_\_\_\_

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PCW 5/95



# Deflating the Giants





**The case is clear – buying from big name manufacturers does not guarantee better performance or better service.**

## What the PRESS say:



March 1995  
Vale Premier



February 1995  
Vale Prestige



January 1995  
Vale Platinum



January 1995  
Vale Platinum Media '95



February 1995  
Vale Platinum



January 1995  
Vale Voyager



January 1995  
Vale Premier  
Media '95

**Dealer or Direct?**  
PC Plus, in their January 1995 edition, pitted a Vale Premier against 'equivalent' machines from Compaq, Elonex and Hewlett Packard, to find which offered the best value for money. The Vale turned in the best performance at the lowest price! When discussing the price difference between the Vale and the Hewlett Packard, they asked "Is any company's reputation worth over £1000 per unit purchased?" And in summing up: "Without hesitation we recommend the Vale Premier from this group."

## COMPUTER SHOPPER



For the last 2 years Evesham Micros have swept the board when it comes to Service Awards.

Our efforts to provide the best possible service have once again been rewarded – the readers of "Computer Shopper" magazine have just voted Evesham Micros "Best Customer Liaison" for 1994.

## What our CUSTOMERS say:



In the 1993 PC Direct 'HITS AWARDS' we won both "Customer Service Excellence" and "Service and Support Excellence" categories as voted by their readers. In 1994 we did it again winning the prestigious "Service Excellence" award. We are especially proud of all these accolades as they were nominated by readers who have actually dealt with our company.

The PC Direct readers also voted us their favourite supplier of these products:



SCANNERS



OPTICAL /CD-ROM DRIVES



UPGRADE CARDS

## What we OFFER:

### READY TO RUN

All systems are fully formatted and pre-installed with DOS and Windows. Comprehensive documentation is of course supplied, including all software disks and manuals, as is a mouse. Any peripherals and upgrades you buy with your PC will, wherever possible, be fully configured and tested.

### DYNAMIC BURN-IN

A rigorous burn-in procedure repeatedly tests all key components. Only after passing this and a final QC inspection do we ship the goods.

### NO CHARGE UNTIL SHIPMENT

If you pay by credit card, payment is not processed until the goods are shipped. Beware of suppliers who charge your credit card weeks before they ship your order!

### ON-SITE MAINTENANCE

All UK mainland based PCs (except the Quest and Voyager notebooks) have the benefit of on-site maintenance for the first year, covering both parts and labour. The length of cover can be extended to 2 or 3 years if desired (see the "Options" section of each page for price details).

### LIFETIME WARRANTY

We also offer a lifetime warranty on labour, so if a problem arises at any time in the future you will only pay for the parts necessary to repair it.

### LIFETIME TECHNICAL SUPPORT

As an owner, you will be privileged with access to an exclusive VALE HOTLINE support number, staffed by friendly knowledgeable people with a full record of your system. Lines open 9am until 5:30pm Monday to Friday, and 10am until 4pm Saturday.

### 30 DAY MONEY BACK GUARANTEE

We are so confident that you will be delighted with your Vale PC that should you, for any reason at all, be unhappy with your purchase, we will COLLECT it and refund your money in full. You will NOT pay any carriage or restocking charges. (UK mainland only).

### ESTABLISHED 11 YEARS

Evesham Micros has been established over 11 years and now has four operating locations with a total annual turnover exceeding £34 million. It has risen to a position of strength in the computer market, with sustained growth and a secure financial status.

### READY TO SHIP

We endeavour to build and despatch all orders as quickly as possible. To this end, we try to maintain a buffer stock of popular configurations which can be either shipped immediately or purchased from one of our showrooms. These models are highlighted with a "Ready to ship" logo in the pricing information.

Custom and other configurations are built to customer order and take a little longer, but we aim to despatch in days not weeks. If you contact us we will give you a realistic estimate of the current delivery situation.

### PCDMA

We are a founder member of the Personal Computer Direct Marketers Association; a collaboration of manufacturers who adhere to a professional code of practice. This assures you of our pledge to provide a high standard of service. Additionally, the new Payment Protection Plan provides peace of mind if you pay by cheque.



### NO DEPOSIT PERSONAL FINANCE

**APR 18.5%**

Available with all purchases over £1000, subject to status. Please see the examples on the following pages. Written quotations are available on request. Interest rate correct at time of going to press but may vary.

### BUSINESS FINANCE

We also offer lease agreements to business, government and educational establishments. Please see the example prices on the following pages. Full written details are available on request.

## The RANGE:

### '486 PCs

We offer a range of '486 desktop PCs from the modestly priced Popular models to the top of the range Premier.

### PENTIUM MODELS

In the Platinum range we offer a computer optimised specifically to provide state of the art performance from the Pentium processor.

### NOTEBOOKS

The Quest notebook is an efficient "no frills" introduction to mobile computing, while the Voyager offers the ultimate in performance and features, in a very modern stylish design.

### FILESERVERS AND NETWORK INSTALLATION

In addition to stand-alone PCs we specialise in the installation and support of a wide variety of network installations. Please see the "Network Solutions" section on page 7 of the advert.

## Corporate Sales

Evesham Micros has a proven track record of supplying some of the country's leading organisations – a wide spectrum of businesses, government bodies and educational establishments. Each of our branches has an established corporate sales team with a wealth of experience and enthusiasm, and the backing of the leading suppliers to the industry. Whether your needs are large or small, they are ready to discuss your requirements and advise on the ideal solution.







# Popular PCI

**DX2-66**  
as standard  
Don't settle for less!!

## At last PCI becomes a popular standard.

The new **Vale Popular PCI** makes the latest technology available in a highly upgradeable package at a budget conscious price.

Quite simply most PCs in this price range do not compete with the performance and features offered with the **Popular PCI**. The motherboard is a bang up to date integrated design that incorporates a fast PCI hard disk controller, a ZIF socket for processor upgrades and 256kb cache RAM coupled with the latest energy saving technology. The 1Mb **Diamond Stealth SE** PCI video card bestows the **Vale Popular** with astonishingly fast video performance for such a moderately priced computer (see the graph on the *Premier* page).

- ♦ Integrated motherboard with Flash BIOS
- ♦ On-board fast PCI hard disk controller
- ♦ Type 3 ZIF socket for processor upgrades, including Pentium Overdrive
- ♦ 4Mb RAM (expandable to 128Mb)
- ♦ 256kb external processor cache
- ♦ 2xPCI, 1xPCI/16-bit & 4x16-bit expansion slots
- ♦ 1 EPP parallel port and 2 serial ports with 16550 UART
- ♦ 1Mb **Diamond Stealth SE** PCI video card
- ♦ 14" SVGA monitor (non-interlaced up to 800x600)
- ♦ 3.5" 1.44Mb Floppy Disk Drive
- ♦ TÜV approved Power Supply with low noise fan
- ♦ EPA Energy Star compliant
- ♦ Low profile desktop case
- ♦ 102-key keyboard
- ♦ MS-DOS 6.22, Windows for Workgroups 3.11 and Mouse
- ♦ 30 day moneyback guarantee
- ♦ 1 year On-Site Maintenance for parts and labour
- ♦ Lifetime technical support hotline
- ♦ Lifetime labour warranty

### POPULAR OPTIONS

8Mb RAM option instead of standard 4Mb .....£120.00 +VAT  
 16Mb RAM option instead of standard 4Mb .....£360.00 +VAT  
 1Gb IDE hard disk instead of standard 528Mb .....£130.00 +VAT  
 Fully non-interlaced monitor (as *Vale Prestige*) .....£50.00 +VAT  
 Fully non-interlaced 15" monitor (as *Vale Premier*) .....£100.00 +VAT  
 Internal High Density 5.25" 1.2Mb Drive .....£49.00 +VAT  
 Second year on-site maintenance .....£69.00 +VAT  
 Second and third year on-site maintenance .....£149.00 +VAT  
 SEE THE PLATINUM PAGE FOR VALE ACCESSORIES

**DIAMOND**  
**Stealth SE**  
1Mb video card  
See the Premier page for details

**new**  
**ZyFi2**

**486DX2-66, 528Mb £799+VAT**

Ready to Ship

**Popular Media '95 £999+VAT**

486dx2-66/528Mb with Media '95 kit (double speed CD-ROM).

Ready to Ship



A Vale Popular Media '95 PC



**Superb multimedia kit available with any Vale model:**

- ♦ Choice of double speed or quad speed CD-ROM drive;
- ♦ ZyFi2 amplified stereo speaker system;
- ♦ Genuine Creative Labs SoundBlaster 16 sound card;
- ♦ Media '95 software bundle.

With double speed CD-ROM drive

**£200+VAT**

With quad speed CD-ROM drive

**£230+VAT**

**MS Encarta '95**  
**MS Works**  
**MS Golf**

**MS Scenes**  
**MS Money**  
**MS Dangerous Creatures**



We offer a full range of multimedia packs and products, any of which can be specified with your Vale PC, see page 9 of our advert for full details. Please note that bundled software does not feature full retail packaging. When ordering double speed CD-ROM installations in Vale computers the Panasonic CR-571 enhanced IDE drive is used.





# Prestige PC

## A "Best Buy" in the PCI stakes.

**A 2Mb video card, non-interlaced monitor and quality keyboard help the Vale Prestige pci earn its laurels.**

Prestige models use a top quality dark screen, low emission 14" SVGA colour monitor which is non-interlaced in all modes including 1024x768. An important point is its ability to display SVGA mode (800x600) at 72Hz refresh rate which is flicker free, making it comfortable to use and restful on the eyes. It also meets the stringent MPR II safety requirements as well as surpassing the EPA Energy Star power saving standard. The keyboard with the Prestige, Premier & Platinum ranges is a full 102-key unit with proper tactile switches and a sturdy metal base. It has consistently impressed reviewers: "...almost traditional in its weight and touch. A deeply desirable device." Computer Buyer, June 1994.

- ♦ Integrated motherboard with Flash BIOS
- ♦ On-board fast PCI hard disk controller
- ♦ Type 3 ZIF socket for processor upgrades, including Pentium Overdrive
- ♦ 4Mb RAM (expandable to 128Mb)
- ♦ 256kb external processor cache
- ♦ 2xPCI, 1xPCI/16-bit & 4x16-bit expansion slots
- ♦ 1 EPP parallel port and 2 serial ports with 16550 UART
- ♦ 2Mb Diamond Stealth SE PCI video card
- ♦ Fully non-interlaced 14" MPR II monitor
- ♦ 3.5" 1.44Mb Floppy Disk Drive
- ♦ TÜV approved Power Supply with low noise fan
- ♦ EPA Energy Star compliant
- ♦ Choice of desktop or mini-tower case
- ♦ Full-tower case available at extra cost
- ♦ 102-key tactile keyboard
- ♦ MS-DOS 6.22, Windows for Workgroups 3.11 and Logitech Mouse
- ♦ 30 day moneyback guarantee
- ♦ 1 year On-Site Maintenance for parts and labour
- ♦ Lifetime technical support hotline
- ♦ Lifetime labour warranty

| 486DX2•66      | 486DX4•100     |
|----------------|----------------|
| 528MB £929+VAT | 528MB £999+VAT |
| 1GB £1059+VAT  | 1GB £1129+VAT  |

### PRESTIGE OPTIONS

|  |              |
|--|--------------|
| 8Mb RAM instead of standard 4Mb  | £120.00 +VAT |
| 16Mb RAM instead of standard 4Mb   | £360.00 +VAT |
| Tekram PCI caching HD controller with 2Mb installed (for IDE hard disks) | £167.00 +VAT |
| 1Gb SCSI hard disk instead of 1Gb IDE                                    | £199.00 +VAT |
| 2Gb SCSI hard disk instead of 1Gb IDE                                    | £450.00 +VAT |
| Double speed CD-ROM drive  | £89.00 +VAT  |
| Quad speed CD-ROM drive  | £119.00 +VAT |
| Internal high density 5.25" 1.2Mb drive                                  | £49.00 +VAT  |
| Full-Tower case  | £50.00 +VAT  |
| Second year on-site maintenance  | £69.00 +VAT  |
| Second and third year on-site maintenance                                | £149.00 +VAT |

SEE THE PLATINUM PAGE FOR VALE ACCESSORIES

**DIAMOND**  
Stealth SE  
2Mb video card  
See the Premier page for details



A Vale Prestige Media '95 PC

**"Best Buy" February 1995,**  
in a group test including PCs from Gateway, IBM, Compuadd & Acer.

"Overall, this is a well-specified, well-constructed computer with good expansion potential, plenty of bells and whistles and sharp performance. A hard combination to beat!"  
Vale Prestige



**Prestige Media '95**  
486DX2-66/528Mb with Media '95 kit (Quad speed CD-ROM).  
Ready to Ship **£1159+VAT**

**Prestige Lotus Office**  
486DX2-66/528Mb with Lotus Multimedia kit (Quad speed CD-ROM).  
Ready to Ship **£1209+VAT**

### MONITOR UPGRADES

|   |              |
|---|--------------|
| Vale EcoScan 15 SVGA colour monitor (as Premier range)  | £50.00 +VAT  |
| 17" Panasonic TX-D1732 SVGA colour monitor, illustrated on Platinum page, (up to 64kHz scan, on-screen control display, EPA Energy Star power saving functions)                       | £399.00 +VAT |
| 17" Tatung CM-17MCR SVGA colour monitor (up to 65kHz scan, 1280x1024 max. res. non-interlaced) "...leads the field in PC Labs' performance tests" (CM-17MBD) - PC Magazine, June 1993 | £299.00 +VAT |
| 17" Tatung CM-17MKR SVGA colour monitor (up to 82kHz scan, 1600x1200 max. resolution non-interlaced)  | £479.00 +VAT |
| 20" Tatung SVGA Low Emission colour monitor (1280x1024 non-interlaced)  | £699.00 +VAT |

# Lotus MULTIMEDIA Office



**Superb multimedia kit available with any Vale model:**

- ♦ Choice of double speed or quad speed CD-ROM drive;
- ♦ ZyFi2 amplified stereo speaker system;
- ♦ Genuine Creative Labs SoundBlaster 16 sound card;
- ♦ Lotus Multimedia software bundle.

With double speed CD-ROM drive

With quad speed CD-ROM drive

**£250+VAT**

**£280+VAT**

- ♦ Lotus 1-2-3, Lotus AmiPro, Lotus Approach, Lotus Screencam, Lotus Smartpics
- ♦ Software Toolworks Grolier Encyclopaedia for 1995 - version 7
- ♦ FIFA International Football, Supervoice, Dragon Lore, MegaRace, Theme Park
- ♦ Professor Windows, Professor Training Suite, Professor Multimedia, Typing Tutor
- ♦ Pilot Multimedia including 'Interlude' and 'Get Organized'

We offer a full range of multimedia packs and products, any of which can be specified with your Vale PC, see page 9 of our advert for full details. Please note that bundled software does not feature full retail packaging. When ordering double speed CD-ROM installations in Vale computers the Panasonic CR-571 enhanced IDE drive is used.







# Premier PCI

The "Recommended" option for serious performance.

If you are looking for a top specification 486 the Vale Premier PCI has class beating credentials.

The Premier PCI range boasts the following enhancements to the Prestige PCI range.

- ◆ 8Mb RAM
- ◆ 2Mb Diamond Stealth 64DRAM 64-bit PCI video card
- ◆ Microprocessor controlled 15" non-interlaced 0.28mm dot pitch monitor

| 486DX2-66       | 486DX4-100      |
|-----------------|-----------------|
| 528MB £1069+VAT | 528MB £1139+VAT |
| 1GB £1199+VAT   | 1GB £1269+VAT   |

## PREMIER OPTIONS

|  |              |
|--|--------------|
| 16Mb RAM instead of standard 8Mb   | £240.00 +VAT |
| Tekram PCI caching HD controller with 2Mb installed (for IDE hard disks) | £167.00 +VAT |
| 1Gb SCSI hard disk instead of 1Gb IDE                                    | £199.00 +VAT |
| 2Gb SCSI hard disk instead of 1Gb IDE                                    | £450.00 +VAT |
| Diamond Stealth 64 Video PCI video card (2Mb)                            | £129.00 +VAT |
| Double speed CD-ROM drive  | £89.00 +VAT  |
| Quad speed CD-ROM drive  | £119.00 +VAT |
| Internal high density 5.25" 1.2Mb Drive                                  | £49.00 +VAT  |
| Full-Tower case  | £50.00 +VAT  |
| Second year on-site maintenance  | £69.00 +VAT  |
| Second and third year on-site maintenance                                | £149.00 +VAT |

**15" MONITOR** The Vale EcoScan 15 that is supplied with the Premier and Platinum ranges is a superb quality micro-processor controlled 15" monitor. A dark non-glare FST screen with 'Edge-to-Edge' display gives as much as 30% greater picture area than 14" models. Complete control over all display adjustments is obtained via a simple digital push button system, with on-screen representation of the settings. As it complies with the stringent Swedish MPR II safety standards and can display 1024x768 at 72Hz refresh rate it is especially kind to your eyes.

If you prefer the luxury of a larger monitor with your PC we offer a choice of 17" and 20" models. Please see the "Monitor upgrades" section below.

The on-screen display shows the current selected video mode and, with the simple push buttons, facilitates easy adjustment of display settings.



## MONITOR UPGRADES

|  |              |
|--|--------------|
| 17" Panasonic TX-D1732 SVGA colour monitor, illustrated on Platinum page, (up to 64kHz scan, on-screen control display, EPA Energy Star power saving functions)                        | £349.00 +VAT |
| 17" Tatung CM-17MCR SVGA colour monitor (up to 65kHz scan, 1280x1024 max. res. non-interlaced) "....leads the field in PC Labs' performance tests" (CM-17MBD) - PC Magazine, June 1993 | £249.00 +VAT |
| 17" Tatung CM-17MKR SVGA colour monitor (up to 82kHz scan, 1600x1200 max. res. non-interlaced)   | £429.00 +VAT |
| 20" Tatung SVGA Low Emission colour monitor (1280x1024 non-interlaced)   | £649.00 +VAT |

## DIAMOND MULTIMEDIA

- ◆ 24-bit True Colour
- ◆ 1280x1024 maximum resolution
- ◆ High performance Windows drivers
- ◆ InControl Tools Windows setup utility

**STEALTH SE** The latest addition to the range continues the tradition of delivering the best price/performance available. It displays 24-bit True Colour at 640x480 with 1Mb DRAM (Vale Popular) or at 800x600 with 2Mb DRAM (Vale Prestige).

**STEALTH 64DRAM** (Vale Premier and Platinum). The Stealth 64DRAM is the world's fastest DRAM accelerator, its S3 Vision864 controller setting a new standard in affordable 64-bit graphics performance. Supplied with full AutoCAD drivers.

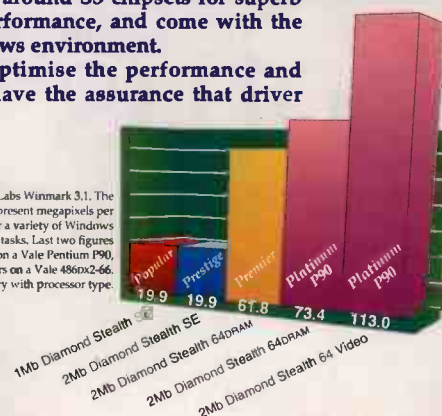
**STEALTH 64 Video** (Option). The new MPEG compatible Stealth 64 Video is the ultimate graphics and full motion video accelerator, catering for full screen video playback at up to 30 frames per second. Its 2Mb high speed VRAM can be expanded to 4Mb, giving 24-bit colour at 1280x1024! Supplied with full AutoCAD drivers.



## Why Diamond Video Cards ?

The highly acclaimed Stealth range has won many press accolades including the coveted PC Magazine "Editors Choice". Now a new range of stealth cards is available, giving a wide choice of graphics performance. They are all based around S3 chipsets for superb Windows acceleration as well as class leading DOS performance, and come with the renowned InControl Tools utility for setting up the Windows environment. Remember that Diamond are continually striving to optimise the performance and compatibility of their video cards; and you therefore have the assurance that driver support is ongoing.

Source: PC Labs Winmark 3.1. The figures represent megapixels per second over a variety of Windows related tasks. Last two figures produced on a Vale Pentium P90, all others on a Vale 486DX2-66. Figures vary with processor type.



## "Recommended" January 1995

In a group test with PCs from Compaq, Elonex & Hewlett Packard. "Without hesitation we recommend the Vale Premier from this group." le Premier Media '95 PC



## "Recommended" March 1995

"When you take into consideration the price and the one year on-site warranty, the Vale offers excellent value for money." Vale Premier



## NO DEPOSIT PERSONAL FINANCE

Example: Buy the Premier Lotus Multimedia Office PC (Cash price £1585.08 inc VAT).

**£56.65** per month.  
No deposit. 36 monthly payments. APR 18.5%.  
Total payable £2039.40 inc VAT.

## BUSINESS FINANCE

Example: Rent the Platinum P90 Lotus Multimedia Office PC for

**£11.02** per week.  
3 year term, payable quarterly.



The Vale 15" microprocessor controlled digital Monitor





# Platinum

## Vale Platinum... the Editors Choice!

Three 1995 magazine accolades already – stunning success for a stunning performer.

- ◆ Next generation Pentium CPU, upgradeable with P54CT via Intel socket 5
- ◆ Integrated motherboard with 2x PCI, 1x PCI/16-bit & 4x16-bit expansion slots
- ◆ 256kb external CPU write-back cache
- ◆ 8Mb RAM (expandable to 192Mb)
- ◆ Fast PCI IDE hard disk controller (528Mb and 1Gb IDE models)
- ◆ Flash BIOS
- ◆ EPP and ECP capable printer port
- ◆ Two 16550 compatible UART driven high speed serial ports
- ◆ Diamond Stealth 64DRAM 2Mb 64-bit video card
- ◆ Microprocessor controlled 15" non-interlaced monitor (as Premier range, see previous page)
- ◆ Full Microsoft Windows 95 'plug and play' support
- ◆ 3.5" 1.44Mb Floppy Disk Drive
- ◆ TÜV approved Power Supply with low noise fan
- ◆ CPU cooling fan ◆ EPA Energy Star compliant
- ◆ 102-key tactile keyboard (as Prestige/Premier range)
- ◆ MS-DOS 6.22, Windows for Workgroups 3.11 and Logitech Mouse
- ◆ Choice of desktop or mini-tower case
- ◆ Full-tower case available at extra cost
- ◆ 30 day moneyback guarantee
- ◆ 1 year On-Site Maintenance (next working day response) for parts and labour
- ◆ Lifetime technical support hotline ◆ Lifetime labour warranty

### PLATINUM OPTIONS

16Mb RAM instead of standard 8Mb .....£240.00 +VAT  
 Tekram PCI caching HD controller with 2Mb installed (for IDE hard disks) .....£167.00 +VAT  
 1Gb SCSI hard disk instead of 1Gb IDE .....£199.00 +VAT  
 Diamond Stealth 64 Video PCI video card (2Mb) .....£129.00 +VAT  
 Double speed CD-ROM drive .....£89.00 +VAT  
 Quad speed CD-ROM drive .....£119.00 +VAT  
 Internal high density 5.25" 1.2Mb Drive .....£49.00 +VAT  
 Full-Tower case .....£50.00 +VAT  
 Second year on-site maintenance .....£69.00 +VAT  
 Second and third year on-site maintenance .....£149.00 +VAT

### PENTIUM P75

528MB £1249 +VAT  
 1GB £1379 +VAT  
 2GB £1829 +VAT

### PENTIUM P90

528MB £1349 +VAT  
 1GB £1479 +VAT  
 2GB £1929 +VAT

Now fitted with  
**STEALTH 64  
 DRAM**  
 as STANDARD



- ◆ Vale Platinum P90 with:
- ◆ 16Mb RAM upgrade
- ◆ Diamond Stealth 64vram video upgrade
- ◆ Panasonic TX-D1732 monitor upgrade
- ◆ Media '95 multimedia kit

"the Evesham Vale Platinum delivers excellent performance, a good feature set and an affordable price—a combination which is the hallmark of a PC Magazine Editor's Choice. In a market where compromise is all too common, the Evesham Vale Platinum is a winner." *January 1995*



January 1995  
 Vale Platinum  
 Media '95 PC



"The Platinum took the top spot in our performance tests. The Diamond Stealth video system had a chance to show its true colours. Not only is the Platinum a top class machine, it's also good value for money."

February 1995 Vale Platinum P90

### NO DEPOSIT PERSONAL FINANCE

Example: Buy the Platinum P90  
 Lotus Multimedia Office PC

(Cash price £1914.08 inc VAT).

**£68.40** per month.

No deposit. 36 monthly payments. APR 18.5%.  
 Total payable £2462.40 inc VAT.

### BUSINESS FINANCE

Example: Rent the  
 Platinum P90 Lotus  
 Multimedia Office PC for

**£13.31** per week.

3 year term, payable quarterly.



A Vale Platinum P90 PC with the optional Panasonic 17" monitor and Panasonic CD-ROM drive

## Platinum Media '95

528Mb model with Media '95 kit (Quad speed CD-ROM).

P75..£1479 +VAT P90..£1579 +VAT

## Platinum Lotus Office

528Mb model with Lotus Multimedia kit (Quad speed CD-ROM).

P75..£1529 +VAT P90..£1629 +VAT

### MONITOR UPGRADES

PLEASE SEE THE PREMIER SECTION FOR MONITOR UPGRADES



# Vale PC Accessories

### TAPE STREAMER BACKUP UNITS

Regular backups are essential to ensure the safety of your data; why not take the advantage of having a tape streamer fitted into your Vale? It is more economical than using multiple floppy disks, as well as being faster and far more convenient. Quoted capacities are with compression software (supplied). All units are supplied with full backup software.



IOmega 250Mb UNIT....£99.00 +VAT  
 DC2120 Tapes for above.....£15.00 +VAT

IOmega 700Mb UNIT..£249.00 +VAT  
 Tapes for above.....£16.00 +VAT

TEAC 1Gb UNIT .....£399.00 +VAT  
 QIC-143 Tapes for above.....£25.00 +VAT

### NEW! LOTUS SMARTSUITE 3

A complete software suite providing the latest versions of leading Windows applications.

- Ami Pro 3.1
- 1.2.3. 5.0
- Organiser 1.1
- Approach 3.0
- Freelance 2.1

**£199.00 +VAT**

Via voucher redemption







# Network Solutions

Whatever your networking requirement, we can provide the complete solution. From a simple two user peer to peer system to a Wide Area Network, we will install and support the entire installation – from initial concept to user training. All our installations are supervised by a Novell Certified Network Engineer, thus assuring our clients of the very best in networking expertise. Why not contact our Corporate Sales staff at your nearest Evesham Micros branch to discuss your requirements.

## The Vale Fileserver

This is just an example of the type of fileserver we can supply. We will be happy to quote for your individual requirements.



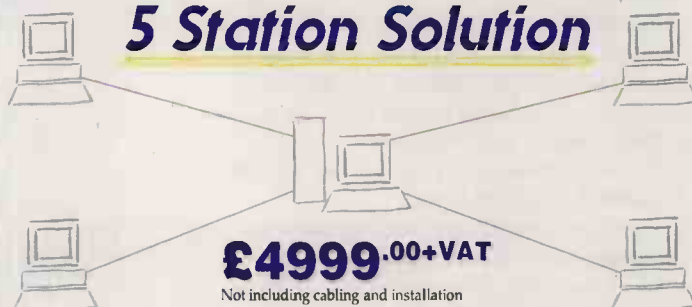
The Vale modular Fileserver system

- ◆ 90MHz Pentium CPU
- ◆ 1Gb SCSI hard disk with PCI controller
- ◆ 8Mb RAM ◆ 256kb cache
- ◆ 1Mb PCI video
- ◆ 14" SVGA monitor
- ◆ 32-bit PCI ethernet card
- ◆ Full-tower case

**£1899.00+VAT**



## 5 Station Solution



**£4999.00+VAT**

Not including cabling and installation

### 1 Fileserver:

- ◆ Vale Pentium P90 Fileserver (as left)

### 4 Workstations:

- ◆ 4x Vale Popular 486DX2+66
- ◆ 528Mb hard disk
- ◆ Ethernet card suitable for 10Base2 or 10BaseT

We fully appreciate that no two network requirements are exactly the same. While the above is an example of one of our solutions, we will be delighted to quote for your individual needs.



# Quest

**1st**

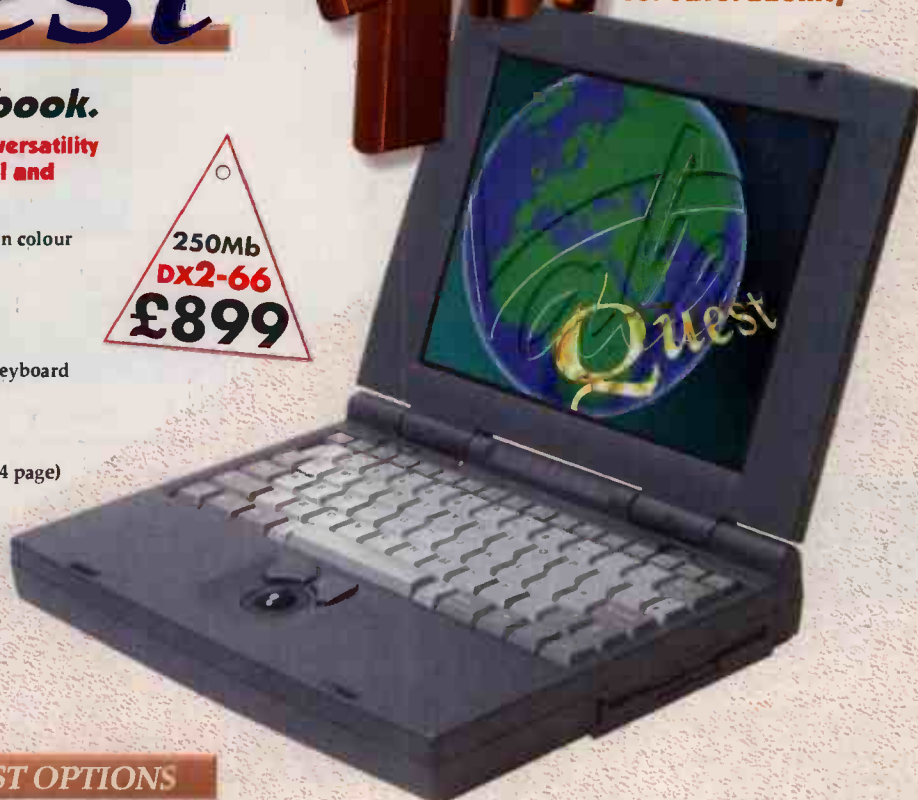
for Value  
for Portability  
for Affordability

## Quest – the compact notebook.

The Quest offers the all essential features and versatility of a full size notebook in an exceptionally small and neat package.

- ◆ 9.4" LCD VGA display, either monochrome or dual scan colour
- ◆ VESA local bus video with 512kb RAM
- ◆ 4Mb RAM
- ◆ Removable hard disk
- ◆ PCMCIA slot (can use a type II or a type III card)
- ◆ Expansion ports include serial, parallel, external PS2 keyboard or mouse, and external VGA monitor
- ◆ Built-in 19mm trackball
- ◆ 3.5" 1.44Mb Floppy Disk Drive
- ◆ Very compact 268mm x 204mm x 45mm (less than an A4 page)
- ◆ Only 4.4lbs mono model or 4.8lbs colour model
- ◆ Up to 3.5 hour battery life with power management
- ◆ Includes MS-DOS 6.22 and Windows 3.11
- ◆ 1 year 'return to base' warranty

**250Mb  
DX2-66  
£899**



### Monochrome

|           | 250MB    | 340MB    | 520MB     |
|-----------|----------|----------|-----------|
| 486dx2-66 | £899+VAT | £999+VAT | £1099+VAT |

### Dual Scan Colour

|           | 250MB     | 340MB     | 520MB     |
|-----------|-----------|-----------|-----------|
| 486dx2-66 | £1199+VAT | £1299+VAT | £1399+VAT |

### QUEST OPTIONS

Upgrade from 4Mb to 8Mb RAM .....£169+VAT  
Carrying case .....£30+VAT





# Voyager



"it's toughness, excellent performance and good display make it a machine that we must honour with the PC today best buy award."  
Vale Voyager 486x2+66  
Dual Scan Colour

**The Vale Voyager, with its flexibility, Windows performance and sound capabilities, is one of the most powerful and stylish notebooks on the market. Its completely modular construction enables it to be tailored to the user's exact needs, now and in the future.**

**'Dual Scan'**  
Colour display  
Offers near  
TFT quality  
at sensible  
cost.



## DISPLAY

A choice of display types is offered – LCD mono, Dual Scan colour and TFT colour. All are 9.5" VGA with 64 greyscales (mono model) or 256 colours (colour models). The display driver is 1Mb 32-bit VESA local bus with Windows acceleration. A port is provided for connection to an external monitor, with up to 1024 x 768 resolution.

## PCMCIA

PCMCIA ports allow for the use of two type II cards or one type III card.

## HARD DISK

The hard disk is removable, offering the ultimate in upgradeability and data security.

## TRACKBALL

A 19mm ergonomically designed trackball is built-in. The surrounding surface makes for a comfortable hand rest whilst typing.

## BATTERY

The primary battery is a long life NiMH unit, giving up to 3-4 hours use with the 486x2-50 mono model, and can be recharged in just 1.5 hours. It can be easily removed and replaced by a second unit. Extensive power management features include doze, sleep and 'suspend to disk' modes. The latter quickly saves your working environment to disk when the lid is closed, allowing you to re-load it later.

## CPU & RAM

Low power consumption CPUs are used to maximize battery life. The motherboard is CPU upgradeable, supporting any '486 up to the DX4-100. 4Mb RAM is fitted as standard, and can be upgraded to 20Mb.

## KEYBOARD

The Voyager uses a full function 86-key keyboard. Unlike many notebooks, it has a good solid feel.

## BUILT-IN AUDIO

The Voyager has a built-in microphone and speaker, with digitized audio recording/playback capability. A Yamaha music chipset (SoundBlaster and Windows Sound System compatible) allows for sound generation. There are sockets for external speakers and microphone. With this audio performance, the addition of a CD-ROM drive makes the Voyager truly 'Multimedia ready'.

## EXPANSION PORTS

Rear panel connectors include serial port; EPP parallel port; SVGA monitor; and PS/2 mouse, keyboard or keypad. A 160-pin port enables fast connection to a docking station (see below for details).

## 3.5" FLOPPY DRIVE

Can be easily removed and replaced.

## STYLISH HIGH QUALITY DESIGN

Slim and attractive, the Voyager measures 286 x 224 x 34mm and weighs just 2.4kg (mono model). The quality of fit and finish is amongst the best we have ever seen.

## WARRANTY

The Voyager features 12 months 'return to base' warranty covering parts, with a lifetime warranty on labour.

## DOS & WINDOWS

The Voyager is supplied with MS-DOS 6.22 and Windows 3.11 installed and ready to run.



A Vale Voyager with the supplied carrying pouch

## Monochrome

|            | 250MB                 | 340MB                 | 520MB                 |
|------------|-----------------------|-----------------------|-----------------------|
| 486dx2+66  | £1049 <sup>+VAT</sup> | £1149 <sup>+VAT</sup> | £1249 <sup>+VAT</sup> |
| 486dx4+100 | £1149 <sup>+VAT</sup> | £1249 <sup>+VAT</sup> | £1349 <sup>+VAT</sup> |

## Dual Scan Colour

|            | 250MB                 | 340MB                 | 520MB                 |
|------------|-----------------------|-----------------------|-----------------------|
| 486dx2+66  | £1349 <sup>+VAT</sup> | £1449 <sup>+VAT</sup> | £1549 <sup>+VAT</sup> |
| 486dx4+100 | £1449 <sup>+VAT</sup> | £1549 <sup>+VAT</sup> | £1649 <sup>+VAT</sup> |

## TFT Colour

|            | 250MB                 | 340MB                 | 520MB                 |
|------------|-----------------------|-----------------------|-----------------------|
| 486dx2+66  | £1949 <sup>+VAT</sup> | £2049 <sup>+VAT</sup> | £2149 <sup>+VAT</sup> |
| 486dx4+100 | £2049 <sup>+VAT</sup> | £2149 <sup>+VAT</sup> | £2249 <sup>+VAT</sup> |

## VOYAGER OPTIONS

|                                 |                      |
|---------------------------------|----------------------|
| Additional primary NiMH battery | £89 <sup>+VAT</sup>  |
| Upgrade from 4Mb to 8Mb RAM     | £169 <sup>+VAT</sup> |
| Upgrade from 4Mb to 12Mb RAM    | £299 <sup>+VAT</sup> |
| Upgrade from 4Mb to 20Mb RAM    | £699 <sup>+VAT</sup> |
| PCMCIA FAX/Modem                | £135 <sup>+VAT</sup> |
| PCMCIA V32 bis FAX/Modem        | £222 <sup>+VAT</sup> |
| PCMCIA Ethernet card            | £139 <sup>+VAT</sup> |
| Carrying case                   | £30 <sup>+VAT</sup>  |
| Docking station                 | £349 <sup>+VAT</sup> |
| Cigar lighter adaptor           | £49 <sup>+VAT</sup>  |
| Additional PSU                  | £49 <sup>+VAT</sup>  |
| External keyboard               | £29 <sup>+VAT</sup>  |
| Soundplus speakers/microphone   |                      |
| earphones system                | £19 <sup>+VAT</sup>  |
| ZyFi2 amplified speakers        | £29 <sup>+VAT</sup>  |
| Total care warranty             | £see panel below     |

## PCMCIA MODEMS

A FAX/modem is the gateway to a world of communications, whether sending and receiving faxes or connecting to the internet information superhighway.



## DOCKING STATION

With a docking station on your desk the Voyager becomes a true "desktop replacement". The docking station has two drive bays (1x3.5" & 1x5.25"), three ISA expansion slots (2x full length & 1x 1/2 length), as well as permanent ports for monitor, keyboard, PS/2 mouse, serial, parallel, speaker, microphone and audio line-in.



## RAM UPGRADES

Make the most of the power of your Voyager by specifying extra RAM – giving a total of either 8Mb, 12Mb or 20Mb.



## TOTAL CARE WARRANTY

Our optional "Total Care" package replaces the existing warranty with 2 year care. If your Voyager should need attention during this period we will collect it and return it to you when repaired. Typical turn-around is 3 working days. This cover is just 12.5% of the cost of the notebook (without accessories) – for example, £131.13<sup>+VAT</sup> for the 486dx2-66/250Mb mono model.

## CARRYING CASE

A versatile, padded case with carrying handle and detachable shoulder strap. Ideal for protecting your Voyager "out in the field".





# Microsoft® MEDIA '95

**Microsoft Encarta '95** The complete multimedia encyclopaedia, harnessing the power of your computer to take you on a journey of discovery and learning.

**Microsoft Works** The integrated productivity suite: Word Processor, Spreadsheet, Database, Graphics, Communications.

**Microsoft Golf** Experience the true-to-life challenges of the game of golf.

**Microsoft Scenes** Superb screen saver.

**Microsoft Money** All you need to take control of your finances.

**Microsoft Dangerous Creatures** See extraordinary creatures come to life in more than 100 exciting narrated videos.

**PhotoCD** software.

**'Challenge Pack'** 9 top game titles

- The Chessmaster 2100 •F-29 Retaliator
- Paperboy 2 •RoboCop 3D •D/Generation
- Contraption Zack •Epic
- Might & Magic II •Push-Over



**These are the ultimate multimedia software packs, featuring a carefully selected combination of productivity and entertainment software. Both are available with the ultimate multimedia hardware packs below. Everything you need to discover the wonderful world of multimedia.**

# Lotus Office

## Superb Lotus Suite:

Lotus 1-2-3

Lotus AmiPro

Lotus Approach

Lotus ScreenCam

Lotus Smartpics



## Top Games Titles:

Supervoice, Dragon Lore, MegaRace, Theme Park, FIFA International Soccer



## Grolier Encyclopaedia:

Software Toolworks Grolier Encyclopaedia for 1995 - version 7



## Plus:

Professor Windows, Professor Training Suite, Professor Multimedia, Typing Tutor Pilot Multimedia including 'Interlude' and 'Get Organized'

Please see the CD-ROM drives for details of the packs. When ordering please quote pack number. We recommend a minimum 486sx33 system for these packs. Please note that bundled versions of software and sound cards are not full retail packs, and the software features on-line documentation.

## PANASONIC CD-ROM DRIVE

CR-562 Double Speed, multi-session drive for only

**£84.99+VAT**

**Includes cables and driver software**

- Double speed 300kb/sec data transfer rate
- Multi-session mechanism - compatible with Kodak Photo CD Standard
- Motorised loading tray - no need for a caddy
- High speed 320ms access
- White book (CDi) compatible for video CDs
- MPC compatible
- Mounts in 5.25" drive bay
- Output from audio CDs via headphone socket
- Requires SoundBlaster or compatible card with Panasonic CD interface



**1B** £144.99 +VAT  
CR-562 bundled with SoundBlaster 16 card

**1C** £164.99 +VAT  
CR-562 with SoundBlaster 16 ASP card

**1E** £98.99 +VAT  
CR-562 with AT-bus driver card

**SPECIAL OFFER!** - "Aldus PhotoStyler" PhotoCD compatible image manipulation software and "Software Toolworks Grolier Encyclopaedia for 1994 - Version 6" with any of the above packs for only £20+VAT.

## COMPLETE MULTIMEDIA PACKS

**Complete multimedia packs featuring the Panasonic CR-562 with a genuine SoundBlaster 16 sound card, ZyFi 2 active speakers, and either of our two software bundles. The speakers can be upgraded to ZyFi 2 PROs for a surcharge of £20+VAT.**



# Microsoft® MEDIA '95

# Lotus Office

**7A** £219.99 +VAT  
CR-562 with Media '95 pack, ZyFi2 speakers and SoundBlaster 16 card

**7B** £239.99 +VAT  
CR-562 with Media '95 pack, ZyFi2 speakers and SoundBlaster 16 ASP

**9A** £249.99 +VAT  
CR-562 with Lotus Multimedia Office, ZyFi2 speakers and SoundBlaster 16 card

**9B** £269.99 +VAT  
CR-562 with Lotus Multimedia Office, ZyFi2 speakers and SoundBlaster 16 ASP

## CREATIVE

CREATIVE LABS, INC.

SoundBlaster 2 Deluxe card ..... £37.50+VAT  
includes "Lemmings" and "Indianapolis 500" games

SoundBlaster PRO Value pack ..... £62.00+VAT

SoundBlaster 16 Value pack ..... £67.00+VAT  
with Panasonic only CD-ROM interface

SoundBlaster 16 MCD card ..... £99.00+VAT

SoundBlaster 16 ASP MCD card ..... £119.00+VAT

MCD (Multi-CD) cards have a triple CD-ROM interface for Panasonic/Sony/Mitsumi drives

SoundBlaster AWE32 card  
- integrated design combines SB16 ASP MCD with WaveBlaster ..... £179.00+VAT

WaveBlaster ..... £115.00+VAT

VideoBlaster SE The ultimate in video versatility for multimedia computing for only ..... £189.00+VAT

TV Coder VGA to Video encoder.  
Transfer your PC creations and manipulations back to video ..... £119.00+VAT

## CD-ROM SOFTWARE

|                                |            |                             |            |
|--------------------------------|------------|-----------------------------|------------|
| 7th Guest .....                | £34.00+VAT | Microsoft Art Gallery ..... | £35.00+VAT |
| Alone in the Dark 2 .....      | £30.00+VAT | Microsoft Bookshelf .....   | £69.00+VAT |
| Beneath a Steel Sky .....      | £30.00+VAT | Mozart Multimedia .....     | £35.00+VAT |
| Cinemania '94 .....            | £36.00+VAT | Musical Instruments .....   | £35.00+VAT |
| Corel Photo CD Access .....    | £15.00+VAT | Quantum Gate .....          | £29.50+VAT |
| Critical Path .....            | £29.50+VAT | Rebel Assault .....         | £31.50+VAT |
| Day of the Tentacle .....      | £31.50+VAT | Return to Zork .....        | £31.50+VAT |
| MS Dinosaurs .....             | £36.00+VAT | Sam & Max .....             | £31.50+VAT |
| Encarta 1995 .....             | £69.00+VAT | Sherlock Holmes 3 .....     | £31.50+VAT |
| Golf .....                     | £29.50+VAT | Sim City .....              | £31.50+VAT |
| Guinness Book of Records ..... | £37.50+VAT | Star Trek 2 .....           | £31.50+VAT |
| JFK Assassination .....        | £29.50+VAT | MS Stravinsky .....         | £35.00+VAT |
| Mavis Beacon MPC version ..... | £32.00+VAT | T.F.X. .....                | £29.50+VAT |
| Mega Rock, Rap & Roll .....    | £49.00+VAT | The Animals .....           | £35.00+VAT |

**Special Offer!** - The following titles are available with any purchase of a CD-ROM drive, Sound card or our special bundles (see right). Please note that they are not full retail packs.

|  |            |   |            |
|--|------------|---|------------|
| 7th Guest .....  | £25.00+VAT | Grolier PreHistoria .....   | £19.00+VAT |
| Animals of San Diego Zoo .....                                     | £15.00+VAT | Secrets of Luftwaffe .....  | £15.00+VAT |
| World Atlas .....  | £15.00+VAT | Sherlock Holmes .....   | £15.00+VAT |
| Cheesemaster 3000 .....  | £15.00+VAT | Microsoft Works 3 .....   | £29.00+VAT |
| Software Toolworks Grolier Encyclopaedia for 1994, Version 6 ..... | £39.00+VAT | PhotoStyler LE .....  | £39.00+VAT |
| Guinness Book of Records .....                                     | £19.00+VAT | 'Challenge Pack' 9 Games .....  | £19.00+VAT |
| Corel Photo CD Access .....  | £15.00+VAT | Microprose 8 Game Pack - 3D Pool, Gunship, Rick Dangerous, Savage, Midwinter & World Class Soccer ..... | £15.00+VAT |



## QUAD SPEED IDE CD-ROM DRIVE

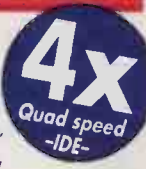
### TOSHIBA XM-5302B ENHANCED IDE DRIVE

With 4x speed and the latest enhanced IDE interface this drive has the performance to cope with the most demanding multimedia applications.

- Enhanced IDE ATAPI interface
- Quad speed 600kb/sec sustained data transfer rate
- Super fast 190ms access
- Output from audio CDs via headphone socket
- Multi-session drive - compatible with Kodak Photo CD
- MPC and White Book (CDi) compatible



This drive requires a sound card with an enhanced IDE interface, and therefore we sell it only in the packs below - not separately.



- |           |                     |   |
|-----------|---------------------|---|
| <b>4A</b> | <b>£174.99 +VAT</b> | XM-5302B with genuine SoundBlaster 16 card    |
| <b>4B</b> | <b>£239.99 +VAT</b> | XM-5302B with genuine SoundBlaster AWE32 lite |
| <b>4C</b> | <b>£274.99 +VAT</b> | XM-5302B with genuine SoundBlaster AWE32      |

Complete multimedia packs featuring the Toshiba XM-5302B with Zyfi 2 active speakers and either of our two software bundles. The speakers can be upgraded to Zyfi 2 PROs for a surcharge of £20+VAT.

## Microsoft Media '95 Lotus Office

- |           |                     |  |           |                     |  |
|-----------|---------------------|--|-----------|---------------------|--|
| <b>5A</b> | <b>£249.99 +VAT</b> | XM-5302B with Media '95 pack, Zyfi 2 speakers and SoundBlaster 16 card | <b>6A</b> | <b>£274.99 +VAT</b> | XM-5302B with Lotus Multimedia Office, Zyfi 2s and SoundBlaster 16 |
| <b>5B</b> | <b>£314.99 +VAT</b> | XM-5302B with Media '95 pack, Zyfi 2s and SoundBlaster AWE32 lite      | <b>6B</b> | <b>£339.99 +VAT</b> | XM-5302B with Lotus Multimedia Office, Zyfi 2s and SB AWE32 lite   |
| <b>5C</b> | <b>£349.99 +VAT</b> | XM-5302B with Media '95 pack, Zyfi 2s and SoundBlaster AWE32           | <b>6C</b> | <b>£374.99 +VAT</b> | XM-5302B with Lotus Multimedia Office, Zyfi 2s and SB AWE32        |

### TEAC CD-55A Super Quad CD-ROM drive

Only **£169.99+VAT** including cables and driver software. Requires sound card with Panasonic CD-ROM interface or AT-Bus driver card.

- |           |                     |  |           |                     |  |
|-----------|---------------------|--|-----------|---------------------|--|
| <b>8A</b> | <b>£183.99 +VAT</b> | CD-55A with AT-bus driver card               | <b>8B</b> | <b>£229.99 +VAT</b> | CD-55A with genuine SoundBlaster 16 card |
| <b>8C</b> | <b>£249.99 +VAT</b> | CD-55A with genuine SoundBlaster 16 ASP card |           |                     |  |

## PC SOUND SOLUTIONS

### SOUNDPLUS 16 CARD Incredible value...£49.99+VAT

A 16-bit stereo sound card, compatible with the SoundBlaster and SoundBlaster Pro, as well as the Windows Sound System, MPU-401 and AdLib standards. It provides CD-ROM interfaces for Panasonic, Sony, Mitsumi and IDE CD-ROM drives, has a MIDI interface/joystick port, and also interfaces for microphone, speakers, audio in/out, and wave table synthesizer. The high specification includes 48kHz stereo sampling rate, a 20 voice FM music synthesizer, and a 4 Watt per channel stereo power amplifier.

- |           |                     |  |
|-----------|---------------------|--|
| <b>3G</b> | <b>£64.99 +VAT</b>  | Soundplus 16 sound card with QS-123 joystick and Soundplus speakers                      |
| <b>3H</b> | <b>£74.99 +VAT</b>  | Soundplus 16 sound card with QS-123 joystick, Zyfi 2 active speakers and Monkey Island 2 |
| <b>3D</b> | <b>£89.00 +VAT</b>  | Pack 3H with genuine SoundBlaster 16 card  |
| <b>3F</b> | <b>£109.00 +VAT</b> | Pack 3H with genuine SoundBlaster 16 ASP card  |



"Monkey Island 2 LeChuck's Revenge" is a registered trademark of Lucasfilm Games

Packs which feature the Zyfi 2 speaker system can be upgraded to Zyfi 2 PROs for a supplement of £20+VAT.



### ZYFI 2 SPEAKERS

THE NEW ZYFI 2 ACTIVE POWER AMPLIFIED STEREO SPEAKERS OFFER THE VERY BEST IN SOUND REPRODUCTION - IDEAL FOR ALL SOUND CARDS AND MULTIMEDIA SYSTEMS!

Feature built-in power amplifier with separate L/R volume controls and tone control. Magnetically shielded.



Only **£29.00 +VAT**



March 1995

"Sound quality is splendid and a great improvement over the originals - stereo comes across well and the sound is crisp. You can get a fair amount of bass too... Zyfi 2s are definitely a sound investment."

### ZYFI 2 PRO SPEAKERS

The latest addition to the serious multimedia system must be our ZYFI 2 PRO Active speaker system.

With a PMPO of 60 Watts per channel and an amplifier with a true 18 Watts RMS per channel rating, the PROs deliver a rich dynamic sound. They feature separate volume, bass and treble controls, and are magnetically shielded. Speaker size 14x23x15cm.



March 1995

"If you've invested in a decent sound card, then you've got to get some serious amplification to do it justice, and these are the boys to add a bit of oomph to your PC, especially if you plan to play some audio CDs or are serious about games."



Only **£49.00 +VAT**



### FX2000 Joystick £18.00+VAT

This recent addition to the highly acclaimed range of Suncom joysticks brings further advances in comfort and control. The pistol grip can be easily rotated to give perfect orientation for left or right handed use, while the unique 'V' designed top fire button allows lightning fast response. Switchable autofire, throttle control and suction feet complete the package. Requires game port.



### FlightMAX £25.00+VAT

Suncom's analogue joysticks always set new standards in quality and performance. The new FlightMAX Advanced Flight Control Console features Suncom's unique 'SATURN-RING' Direct Drive Technology. This feature equalises control stick tension in all directions, for constant 'G' tracking. FlightMAX also has dual fire buttons, throttle and rudder controls - right at your fingertips. Requires game port.

### COMMAND CONTROL £17.00+VAT

**TWO-HANDED HIGH DEFINITION CURSOR CONTROL - IDEAL FOR ALL GAMES!**  
New from Suncom Technologies is this exclusive Command Control. Giving full two handed cursor control it adds a new dimension to playing action games. Two fire buttons and autofire buttons at your fingertips maximize your scoring. Requires game port.



### FLIGHTSTICK £30.00+VAT

THE FLIGHTSTICK IS CONSISTENTLY REVIEWED AS THE BEST QUALITY JOYSTICK IN ITS CLASS

Test fly a Flightstick with your favourite simulator and you will know the meaning of control. Whether you're a novice or experienced combat pilot, flying skills will be improved and enemy kill rate will increase. Excellent construction - looks and feels like the real thing! Includes throttle control and 7ft long connection cable. Requires game port.



### FLIGHTSTICK PRO £55.00+VAT

THE ULTIMATE COMBAT STICK FOR COMPUTER PILOTS!

The new Flightstick PRO from CH Products offers the ultimate in fingertip control. It has four fire buttons, and a four-way switch which allows you to control weapons, radar and viewing functions on more advanced software - all without taking your hand from the stick! With its top quality sturdy construction it is designed to last for years. Includes driver software and long connection cable. Requires game port.



### FLIGHT YOKE £39.00+VAT

Introducing G-FORCE from Suncom, designed for realistic control of all simulation software.

The G-FORCE functions as a full size aviation yoke with pitch and roll control, and twin fire buttons at your thumb-tips. For driving games, simply engage the column lock and G-FORCE functions as a stable steering wheel. The base plate has large suction feet and table edge clamps. Requires game port.



### VIRTUAL PILOT £68.00+VAT

THE MOST REALISTIC FLIGHT YOKE AVAILABLE FOR THE PC

Enjoy the ultimate realism in all flight simulation games with the Virtual Pilot, made in the USA by CH Products. Looking just like a real alpine yoke, it is designed for the ultimate precision, giving you superb control. Also ideal for driving games. Clamps to table top. Requires game port.



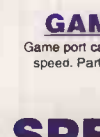
### VIRTUAL PILOT PRO £79.00+VAT

The VIRTUAL PILOT PRO has all the best features of the award winning VIRTUAL PILOT. It adds four extra fire buttons and two four-way switches for unrivalled control in all combat and simulation games. Requires game port.



### PRO PEDALS £89.00+VAT

Featuring dual operating modes for forward and back rudder motion, as well as pivot movement for driving games, the CH Products PRO PEDALS provide gamers with the most realistic flying and driving experience. They also include aircraft style toe-brakes, and independent accelerator and brake control. They are designed to work with all CH Products joysticks and yokes, and are built with rugged components to withstand the toughest competitor. Require game port.



### GAME PORT 2000 £12.50+VAT

Game port card for any of these joysticks and yokes. Works with any clock speed. Particularly recommended for 486x2-66 and Pentium systems.



## UPGRADES & ACCESSORIES

### VIDEO CARDS

## DIAMOND

MULTIMEDIA

### Why Diamond Video Cards?

The highly acclaimed Stealth range has won many press accolades including the coveted PC Magazine "Editors Choice", and the new *Stealth SE* and *Stealth 64 Video* continue the tradition of delivering the best price/performance available. They are all based around S3 chipsets for superb Windows acceleration as well as class leading DOS performance, and come with the renowned InControl Tools utility for setting up the Windows environment.

|  |                         |
|--|-------------------------|
| Diamond Stealth 24 VL Bus (1Mb)        | £79.00 <sup>+VAT</sup>  |
| Diamond Stealth 64DRAM VL Bus (2Mb)    | £129.00 <sup>+VAT</sup> |
| Diamond Stealth 64DRAM PCI Bus (2Mb)   | £130.00 <sup>+VAT</sup> |
| Diamond Stealth 64 Video VL Bus (2Mb)  | £249.00 <sup>+VAT</sup> |
| Diamond Stealth 64 Video PCI Bus (2Mb) | £250.00 <sup>+VAT</sup> |
| Diamond Stealth SE PCI Bus (1Mb)       | £78.00 <sup>+VAT</sup>  |
| Diamond Stealth SE VL Bus (1Mb)        | £79.00 <sup>+VAT</sup>  |

### MONITORS

Due to our bulk purchasing power for our own Vale PCs, we are able to offer the following high specification monitors at very competitive prices.



#### Vale EcoScan15

- On screen micro-processor controlled digital adjustments
- Fully non-interlaced
- 72Hz Flicker-Free at 1024x768
- Low radiation (MPR II)
- 1280 x 1024 max. res.
- Energy Star power saving

ONLY £249.00<sup>+VAT</sup>

Tatung 14" SVGA Monochrome .....£99.00<sup>+VAT</sup>

Vale Eco14 SVGA Colour .....£149.00<sup>+VAT</sup>  
0.39mm dot pitch (as Vale Popular)

Vale EcoScan14 SVGA Colour .....£199.00<sup>+VAT</sup>  
0.28mm dot pitch (as Vale Prestige)

Panasonic TX-D1732 17" SVGA Colour. £599.00<sup>+VAT</sup>  
On-screen control display • EPA power saving functions • Up to 64KHz horiz. scan

Tatung CM-17MCR 17" SVGA Colour .....£479.00<sup>+VAT</sup>  
1280x1024 max. res. (non-interlaced) • 0.28mm dot pitch • Up to 65KHz horiz. scan

Tatung CM-17MKR 17" SVGA Colour .....£649.00<sup>+VAT</sup>  
1600x1200 max. res. (non-interlaced) • 0.28mm dot pitch • Up to 82KHz horiz. scan "....leads the field in PC Labs' performance tests" (CM-17MBD) - PC Magazine, June 1993

Tatung 20" SVGA Colour .....£899.00<sup>+VAT</sup>  
1280x1024 max. res. (non-interlaced) • 0.31mm dot pitch • Auto 29-65KHz horiz. scan

### PROCESSORS



|  |                         |
|--|-------------------------|
| 486dx2-66                              | £99.00 <sup>+VAT</sup>  |
| Heatsink and fan recommended           |                         |
| 486dx4-100                             | £179.00 <sup>+VAT</sup> |
| Heatsink and fan recommended.          |                         |
| Motherboard support for 3.3V required. |                         |
| Pentium P60                            | £229.00 <sup>+VAT</sup> |
| Heatsink and fan recommended.          |                         |
| Pentium P75                            | £249.00 <sup>+VAT</sup> |
| Heatsink and fan recommended.          |                         |
| Pentium P90                            | £349.00 <sup>+VAT</sup> |
| Heatsink and fan recommended.          |                         |
| CPU Heatsink                           | £3.00 <sup>+VAT</sup>   |
| 486 fan & heatsink                     | £10.00 <sup>+VAT</sup>  |
| Pentium fan & h/sink                   | £12.50 <sup>+VAT</sup>  |

### MEMORY UPGRADES

|                               |                         |
|-------------------------------|-------------------------|
| 1Mb 30-pin SIMM (3 chip) 70ns | £34.00 <sup>+VAT</sup>  |
| 4Mb 30-pin SIMM (3 chip) 70ns | £120.00 <sup>+VAT</sup> |
| 4Mb 72-pin SIMM 70ns 32-bit   | £120.00 <sup>+VAT</sup> |
| 8Mb 72-pin SIMM 70ns 32-bit   | £240.00 <sup>+VAT</sup> |



### MOTHERBOARDS

## SPECIAL PRICES



Our bulk purchase of motherboards allows us to offer you these special prices.

486 UP TO DX2-66 (TYPE 2) .....£69.00<sup>+VAT</sup>

- 3xVESA local bus/ISA slots • 3xISA slots • 256kb Cache
- ZIF socket • P24T upgradeable • Will accept most 486 CPUs up to DX2-66 • Accepts 30-pin and 72-pin SIMMs.

#### SPECIAL OFFERS!

Type 2 board with 486dx2-66 processor .....£163.00<sup>+VAT</sup>

486 UP TO DX2-66 (TYPE 4) .....£85.00<sup>+VAT</sup>

- 3xPCI local bus slots • 4xISA slots • ZIF socket • P24T upgradeable • 256kb Cache • Will accept most 486 CPUs up to DX2-66 • Accepts 72-pin SIMMs.

#### SPECIAL OFFER!

Type 4 board with 486dx2-66 processor .....£179.00<sup>+VAT</sup>

486 UP TO DX4-100 (TYPE 7) .....£99.00<sup>+VAT</sup>

- 3xPCI local bus slots • 4xISA slots • ZIF socket • P24T upgradeable • 256kb Cache • On-board PCI IDE hard disk controller • 2x 16550 compatible UART driven high speed serial ports • EPP and ECP compatible parallel port • Will accept most 486 CPUs up to DX4-100 • Accepts 72-pin SIMMs.

#### SPECIAL OFFERS!

Type 7 board with 486dx2-66 processor .....£193.00<sup>+VAT</sup>

Type 7 board with 486dx4-100 processor .....£273.00<sup>+VAT</sup>

PENTIUM P75/P90 (TYPE 6) .....£169.00<sup>+VAT</sup>

- DESIGNED FOR PENTIUM P75 OR P90 PROCESSOR • 2xPCI local bus slots • 1xPCI/ISA bus slot • 4xISA slots • ZIF socket • 256kb Cache • On-board PCI IDE hard disk controller • 2x 16550 compatible UART driven high speed serial ports • EPP and ECP compatible parallel port • Accepts 72-pin SIMMs.

#### SPECIAL OFFERS!

Type 6 board with Pentium P75 processor .....£408.00<sup>+VAT</sup>

Type 6 board with Pentium P90 processor .....£508.00<sup>+VAT</sup>

### HARD DISKS

## COST EFFECTIVE MASS STORAGE



Drive mechanism only:

|  |                         |
|--|-------------------------|
| Optional installation kit (5.25" mounting bracket kit plus cables) | £10.00 <sup>+VAT</sup>  |
| Seagate ST3290A (IDE) 250Mb  | £142.00 <sup>+VAT</sup> |
| Seagate ST3660A (IDE) 528Mb  | £135.00 <sup>+VAT</sup> |
| Seagate ST314200A (IDE) 1Gb  | £249.00 <sup>+VAT</sup> |
| Seagate ST31200N (SCSI) 1Gb  | £399.00 <sup>+VAT</sup> |

### HD CONTROLLER CARDS

|  |                         |
|--|-------------------------|
| VL bus IDE controller with 2x hard disk/floppy disk ports, 2x serial ports, 1x parallel port | £19.00 <sup>+VAT</sup>  |
| Tekram (PCI bus) c/w 0Mb RAM (upgradeable to 16Mb)   | £99.00 <sup>+VAT</sup>  |
| Tekram (PCI bus) c/w 2Mb RAM (upgradeable to 16Mb)   | £167.00 <sup>+VAT</sup> |



#### PROMISE CACHING HARD DISK CONTROLLERS

|   |                         |
|---|-------------------------|
| DC4030 (VL bus) c/w 0kb RAM (upgradeable to 16Mb) | £89.00 <sup>+VAT</sup>  |
| DC4030 (VL bus) c/w 2Mb RAM (upgradeable to 16Mb) | £149.00 <sup>+VAT</sup> |

### UPSs

Protect your installation from mains power faults with an Upsonic uninterruptible power supply.



|                                   |                      |
|-----------------------------------|----------------------|
| UPSONIC Station 28 280VA rating   | £95 <sup>+VAT</sup>  |
| UPSONIC Station 40 400VA rating   | £155 <sup>+VAT</sup> |
| UPSONIC Station 60 600VA rating   | £209 <sup>+VAT</sup> |
| UPSONIC Station 90 900VA rating   | £309 <sup>+VAT</sup> |
| UPSONIC Station 140 1400VA rating | £419 <sup>+VAT</sup> |
| UPSONIC Station 200 2000VA rating | £649 <sup>+VAT</sup> |

### SYSTEM SERIES ON-LINE UPSs

- True on-line protection • True Sine wave output
- Fully automatic operation with LED status indicators
- Communications interface for use with automatic shutdown software
- System 300 has comprehensive LCD display of operating, monitoring and diagnostic information

|                                  |                       |
|----------------------------------|-----------------------|
| UPSONIC System 60 600VA rating   | £499 <sup>+VAT</sup>  |
| UPSONIC System 100 1000VA rating | £599 <sup>+VAT</sup>  |
| UPSONIC System 300 3000VA rating | £1399 <sup>+VAT</sup> |

### AMSTERN ACCESSORIES

|   |                        |
|---|------------------------|
| 3.5" 720kb Internal floppy drive for PC1512/1640. Suits any single drive machine. Complete kit with full instructions | £51.06 <sup>+VAT</sup> |
| PC1512 RAM upgrade to 640k with full instructions   | £25.49 <sup>+VAT</sup> |



## NETWORK PRODUCTS

**Reliability is the key to network installations – you cannot afford to make compromises. Kingston offer top quality branded products at an affordable price.**



**Novell compatible 16-bit network card.**  
Fully Novell authorised and tested.

- 10BaseT and 10Base2 I/O ports
- Faster than and compatible with NE2000 cards
- NETBIOS compatible
- 10Mbps

**£45.00 +VAT**

Kingston card with Novell Network Lite...£65.00 +VAT



### Network hubs.

9 port stackable hub...£169.00 +VAT  
16 port hub...£299.00 +VAT



**Pocket LAN adaptor & PCMCIA ethernet card.**

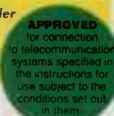
Pocket LAN adaptor (connects to parallel port)  
10Base2 & 10BaseT...£110.00 +VAT  
PCMCIA Combo card (type II)  
10Base2 & 10BaseT...£139.00 +VAT

*We are NOVELL authorised suppliers – Please contact us regarding your specific networking requirements.*

## Fax FAX/MODEMS



Authorised Dealer



### MICROLIN fax modems

**V22bis units (2400 bps Modem. 9600bps FAX)**

MICROLIN fx portable external unit...£97 +VAT  
MICROLIN fx internal unit...£85 +VAT  
MICROLIN NB 24 PCMCIA type II unit...£135 +VAT

**V32bis units (14400 bps Modem and FAX)**

MICROLIN fx 32Plus portable external unit...£172 +VAT  
MICROLIN fx 32Plus internal unit...£154 +VAT  
MICROLIN NB 32Plus PCMCIA type II unit...£222 +VAT

### MobiFax

The MobiFax personal fax modem is the affordable way to enhance your PC with communications ability. Send and receive faxes, and access online information services and the Internet. All you need is MobiFax, your PC, and a phone socket.

- Includes free registration and online time for the Compuserve information service and the Almac bulletin board system

**MobiFax 24 package...£79 +VAT**

V22bis (2400 bps) Modem. 9600bps FAX

**MobiFax 144 package...£119 +VAT**

V32bis (14400 bps) Modem. 14400bps FAX



## MOUSE & TRACKBALLS

### TRUEMOUSE £19.00 +VAT

The smoothest, most responsive and accurate mouse you can buy for the PC. Excellent performance, amazing low price! 3-Button Serial (9-way & 25-way) and PS/2 versions available – please state which version is required when ordering.



### TRACKBALL £30.00 +VAT

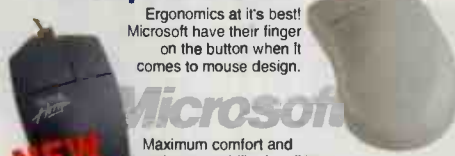
Super smooth, accurate and versatile; perfect for the Windows environment, as well as games – accurate total one-handed control is a doddle! Top quality construction and opto-mechanical design, delivering high speed and accuracy every time. Full Microsoft compatible driver software supplied.



### MS Mouse 2.0 £38.00 +VAT

#### Intellipoint version

Ergonomics at it's best! Microsoft have their finger on the button when it comes to mouse design.



Maximum comfort and optimum usability for all home PC users. With the Home Edition of Intellipoint Software

**£27.00 +VAT MS Home Mouse**

### MITSUMI MOUSE £9.99 +VAT

A very stylish, comfortable and good quality mouse at a budget price. As used in our Vale Popular range of PCs.



## KEYBOARDS

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Made for us by Mitsumi, this is the 102-key keyboard used in our Vale Popular range of PCs. A very neat and attractive design, it is superb value for money.

**£25.00 +VAT**



A top quality 102-key keyboard as used in our Vale Prestige, Premier and Platinum ranges of PCs. It features proper tactile keys and a sturdy metal base. This unit has consistently impressed reviewers: "...almost traditional in its weight and touch. A deeply desirable device." Computer Buyer, June 1994

## SOFTWARE BARGAINS



### Test drive these top applications today!

With a 60 day money back guarantee you have nothing to lose.

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Competitive upgrade

**£229.00 +VAT**

- Lotus 1-2-3 v5.0  
Redefining spreadsheet productivity
- Lotus Freelance Graphics v2.1  
The fastest, easiest way to a great presentation
- Lotus Ami Pro v3.1  
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Version upgrade **£174.00 +VAT**  
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- Lotus Organizer v1.1  
The easiest way to manage your time and work
- Lotus Approach v3.0  
It's never been easier to use a database

Outright purchase  
No competing product?  
Don't worry, we will supply a qualifying product free of charge.

## Microsoft Office

Competitive Upgrades

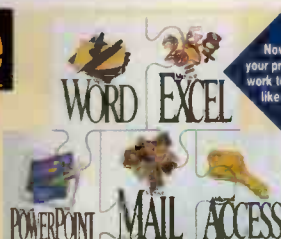
**OFFICE STANDARD 4.2**

**£249.00 +VAT**

**OFFICE PROFESSIONAL 4.3**

**£289.00 +VAT**

Competitive Upgrades are via voucher redemption.



Now all your programs work together like one!

- ◆ MS Word
- ◆ MS Excel
- ◆ MS Powerpoint
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- ◆ MS Access (Office professional only)

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Version upgrade...£169.00 +VAT  
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## IMOMEGA TAPE BACKUP

Top quality tape streamer available as either an internal or a stand alone unit. The stand alone version simply connects to the PC's parallel port, with a through port for printer operation.

- ◆ Internal unit and external 'parallel port' version available
- ◆ Industry standard QIC-80 recording format
- ◆ The only drive to read QIC tapes and Irwin tapes
- ◆ Internal unit includes DOS backup software
- ◆ Parallel port unit includes Central Point backup software (for DOS)
- ◆ 2 year warranty



**PC today**  
"A superb combination of tape drive and software."  
PC Today, December 1993  
Imometa Tape250 Parallel Port Unit



### 250Mb Version

INTERNAL UNIT

**£99.00 +VAT**

DC2120 tape for 250Mb Unit...£15.00 +VAT

PARALLEL PORT UNIT

**£199.00 +VAT**

### 700Mb Version

INTERNAL UNIT

**£249.00 +VAT**

Tape for 700Mb Unit...£16.00 +VAT

PARALLEL PORT UNIT

**£329.00 +VAT**

Tape for 700Mb Unit...£16.00 +VAT

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**ALL SCANNERS ARE  
TWIN COMPLIANT**

**True 256 GREYSCALE HANDY SCANNER with all the right features, including O.C.R. and extensive graphics editing facilities.**

## True 24-bit Colour Version

Providing powerful colour scanning tools, this package enables high quality colour images to be generated for use in professional graphics presentations.

### COLOUR SCANNER FEATURES:

- Colour mode gives genuine 16 million colour, 400dpi hardware scanning (not software interpolated)
- Greyscale mode with true 256 greyscales at up to 400dpi
- Halftone and Line-art modes at up to 400dpi

### PACKAGE INCLUDES:

- HAND-HELD COLOUR SCANNER & INTERFACE CARD
- 'iPhoto Plus' top professional Windows based Image Scanning and Photograph re-touching software
- 'PERCEIVE PERSONAL' powerful OCR Windows software, giving simple, efficient operation with highly effective results

Requires '386 or higher, Windows 3.1 or higher, at least 4Mb RAM, Mouse, Hard Drive and 256 colour SVGA graphics or higher,

**Personal  
Computer  
World**

"...I have found the quality of photographic and line-art scans to be good, and with Picture Publisher thrown in, this is extremely good value for money."

Personal Computer World, September 1994

"...I have found the quality of photographic and line-art scans to be good, and with Picture

Publisher thrown in, this is extremely good value for money."

- Genuine 256 greyscale performance (not interpolated from 32 greyscales) giving photo-realistic quality monochrome scans, with actual shades and shadows, at up to 400dpi

- Halftone and Line-art scanning at genuine 800dpi resolution

- Full 105mm wide scanning head

- Eight selectable scanning resolutions between 100 and 800dpi

- Variable brightness control

- Built-in scan speed indicator

- Includes "iPhoto Plus" top professional Windows based image scanning and photograph re-touching software, and "Perceive Personal" OCR software



Requires '386 CPU or above with Colour Monitor, at least 4Mb RAM, Windows 3.1 or higher, Hard Drive and Mouse.

**WHAT  
PC?  
BEST BUY**

"Superb quality results time after time. The ease of use is commendable and the bundled software offers brilliant value for money... We therefore recommend the Mustek without hesitation."

What PC?, August 1993

with internal interface card **£59.00+VAT**

or with 'parallel port' interface (see bottom left) **£125.00+VAT**

**M Scanners from  
Mustek**



Produced by the 24-bit hand scanner at 300dpi.

**£129.00+VAT**  
Clearly excellent value !

## TRY BEFORE YOU BUY

**SCAN  
SERVICE**

To help with your choice of scanner we have prepared a sample disk pack for each of the three units featured on this page.

Each sample pack contains several images (including the Cor and Child) scanned in various modes to provide an exact representation of each unit's capabilities - before you buy.

A fact sheet is also included containing loading instructions, scanning info., and printed originals produced by the scanner of your choice for comparison.

Please state which scanner you are interested in (greyscale, colour or flatbed). Supplied on 3 1/2" disks.



Cost Per Pack  
**£5.00+VAT**

including delivery - refundable on purchase of a scanner.

## External SCANNER INTERFACE

### Connect your scanner to your printer port!

This compact in-line interface box does away with the need to install an expansion card for your scanner by simply plugging into the Parallel port. It is ideal for anyone who wants to transfer their scanner quickly between computers, as well as notebook owners and those who have simply run out of expansion ports. Compatible with the Mustek Black & White, Greyscale, & 24-bit Colour hand-held scanners.



**only £69.00+VAT**

## FLATBED A4 COLOUR SCANNERS

- Two models available: 600dpi unit, giving 1200dpi via interpolation; and 1200dpi unit, giving 2400dpi via interpolation
- Line art, 8-bit grey and 24-bit colour modes
- 12 built-in halftoning patterns
- 216mm x 356mm scan area
- SCSI expansion card interface supplied
- Both units include powerful OCR software and 'iPhoto Plus' Image Scanning and Photograph re-touching software

**up to  
2400  
dpi**



"Excellent value for money. The works for only £700."

**PERSONAL  
COMPUTER**  
December 1993

**Personal  
Computer  
World**  
April 1993

"The MFS6000C is a quality piece of hardware... Superb results."

"The Mustek MFS-1200CX provides a good set of features at the lowest price in the test group... If you need an inexpensive high-resolution scanner, then the Mustek MFS-1200CX should be on your shortlist."

**PC  
MAGAZINE**  
October 1994

**600/1200dpi £299.00+VAT**  
**1200/2400dpi £449.00+VAT**  
Transparency adaptor.....£299+VAT  
Sheet feeder.....£299+VAT

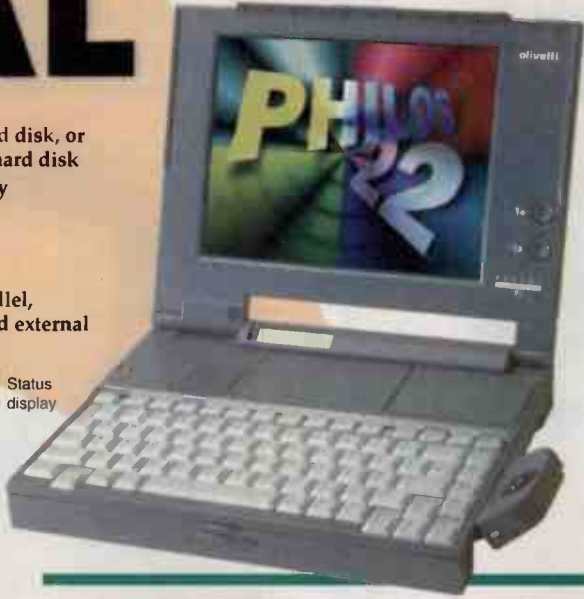
Requirements: 386 or higher, Windows 3.1 or higher, Mouse, Hard Drive and 256 colour SVGA graphics or higher. 600dpi unit needs at least 4Mb RAM, 1200dpi unit needs at least 8Mb RAM.



# IT'S A STEAL

AN **OLIVETTI '486**  
FOR **£649 ?**

- Intel 25MHz 486SL processor
- Monochrome model with 80Mb hard disk, or Passive Colour model with 120Mb hard disk
- 10" mono or 9.4" colour VGA display
- 4Mb RAM, expandable to 32Mb
- PopUp™ trackball
- 3.5" 1.44Mb floppy disk drive
- Expansion ports include serial, parallel, external PS2 keyboard or mouse, and external VGA monitor (via adaptor cable)
- Comprehensive Status display
- Weight: Mono 4.4lbs / Colour 5.5lbs
- Dimensions: 279 x 216 x 44mm (mono) or 49mm (colour)
- Preloaded MS-DOS, Windows, Lotus Organiser, online manuals



## PHILOS OPTIONS

- Upgrade from 4Mb to 8Mb RAM .....£180<sup>+VAT</sup>
- Full size keyboard with 14" colour monitor and monitor cable .....£239<sup>+VAT</sup>
- Carrying case .....£30<sup>+VAT</sup>
- Cable for external VGA monitor .....£15<sup>+VAT</sup>



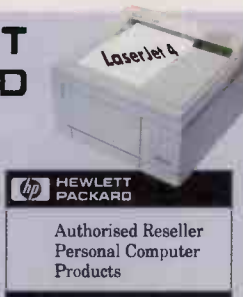
Side view

**Go on Twist our arm!**  
mono **£599.00 +VAT**  
colour **£899.00 +VAT**

## HP HEWLETT PACKARD

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- HP LaserJet 4 ML .....£799.00<sup>+VAT</sup>
- HP LaserJet 4 MP .....£949.00<sup>+VAT</sup>
- HP LaserJet 4 Plus .....£1049.00<sup>+VAT</sup>
- HP LaserJet 4 M Plus .....£1399.00<sup>+VAT</sup>

- PostScript Level 2 upgrade for LaserJet 4 .....£229.00<sup>+VAT</sup>
- 2Mb RAM upgrade for LaserJet III / IIP .....£119.00<sup>+VAT</sup>
- 4Mb RAM upgrade for LaserJet III / IIP .....£169.00<sup>+VAT</sup>
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Authorised Reseller  
Personal Computer  
Products

- HP DeskJet 320 .....£185.00<sup>+VAT</sup>
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- HP DeskJet 520 .....£219.00<sup>+VAT</sup>
- NEW! HP DeskJet 540 .....£218.00<sup>+VAT</sup>
- Colour kit for 310/320/540 .....£35.00<sup>+VAT</sup>
- HP DeskJet 560C .....£364.00<sup>+VAT</sup>
- HP DeskJet 1200C .....£699.00<sup>+VAT</sup>
- HP DeskJet 1200C/PS .....£1099.00<sup>+VAT</sup>

- HP DeskJet long life black ink cartridge .....£25.00<sup>+VAT</sup>
- HP DeskJet long life cyan ink cartridge .....£25.00<sup>+VAT</sup>
- HP DeskJet 3 year On-Site warranty agreement (mono models) .....£55.00<sup>+VAT</sup> (colour models) .....£65.00<sup>+VAT</sup>
- 256kb RAM cartridge for DeskJet Plus / 500 .....£59.00<sup>+VAT</sup>

## STAR

- Star XB24-200 .....£346.00<sup>+VAT</sup>
- Star XB24-250 .....£425.00<sup>+VAT</sup>
- Star SJ-144 Colour .....£362.00<sup>+VAT</sup>
- Star WinType 4000 laser (requires Windows 3.1 or later) .....£319.00<sup>+VAT</sup>

## EPSON

- Epson LX300 .....£100.00<sup>+VAT</sup>
- Epson LQ570+ .....£215.00<sup>+VAT</sup>

## PANASONIC

- Panasonic KX-P2135 .....£139.00<sup>+VAT</sup>
- Panasonic KX-P2624 .....£339.57<sup>+VAT</sup>

Cut Sheet feeders are available for most printers. Please call for price / availability

## CANON

- Canon BJ-10SX Portable .....£147.00<sup>+VAT</sup>
- Canon BJ-200 (Epson compatible) .....£199.00<sup>+VAT</sup>
- Canon BJ-230 .....£275.00<sup>+VAT</sup>
- Canon BJ-C600 .....£389.00<sup>+VAT</sup>
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## TEXAS INSTRUMENTS

- Ti microWriter .....£449.00<sup>+VAT</sup>
- Ti microWriter PS23 .....£599.00<sup>+VAT</sup>
- Ti microWriter PS65 .....£699.00<sup>+VAT</sup>
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This product can seriously  
SAVE you money.

**INK REFILLS**  
For HP DeskJet/300/  
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The best and easiest to use Inkjet refills we have found. Comprehensive and simple to follow instructions are supplied. Each pack will refill a standard cartridge four times, or a long life cartridge twice.

**ONLY £11.99+VAT**

- that's as little as £3 per cartridge fill!

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Fantastic ex-Vale range monitor bargains, similar specification to the current range but without Energy Star features.

- Categories: 1. As new
- 2. Minor imperfections
- 3. Discoloured and/or slightly damaged cases

**14" SVGA 0.28mm dot pitch**

- 1. - £179<sup>+VAT</sup> 2. - £159<sup>+VAT</sup> 3. - £145<sup>+VAT</sup>

**Vale VISA Scan15 0.28mm dot pitch**

- 1. - £229<sup>+VAT</sup> 2. - £199<sup>+VAT</sup> 3. - £179<sup>+VAT</sup>

**Tatung 17" SVGA**

- 2. - £399<sup>+VAT</sup> 3. - £349<sup>+VAT</sup>

### PRINTERS

**DOT MATRIX**

- Panasonic KX-P2123 24-pin colour .....£119.00<sup>+VAT</sup>
- NEC P20 24-pin .....£149.00<sup>+VAT</sup>
- NEC P6+ 24-pin .....£169.00<sup>+VAT</sup>
- Citizen Project 24-pin .....£169.00<sup>+VAT</sup>
- Epson LQ860, Pro quality 24-pin .....£299.00<sup>+VAT</sup>

Cut Sheet Feeder for Star FR10

- Star XB24-200 .....£19.00<sup>+VAT</sup>

**INKJET**

- Citizen Project .....£149.00<sup>+VAT</sup>
- HP DeskJet 520 .....£189.00<sup>+VAT</sup>
- HP DeskJet 560 Colour .....£339.00<sup>+VAT</sup>
- Olivetti JP150 .....£129.00<sup>+VAT</sup>
- Olivetti JP350S .....£169.00<sup>+VAT</sup>
- Epson Stylus 800 .....£199.00<sup>+VAT</sup>

**LASER**

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- Ti microWriter (new) .....£249.00<sup>+VAT</sup>
- Ti microWriter PS23 (PostScript) .....£399.00<sup>+VAT</sup>
- Ti microWriter PS65 (PostScript) (new) .....£599.00<sup>+VAT</sup>

### OTHERS

- Triumph Adler notebook, 486sx25, 120Mb HD, mono screen .....£699.00<sup>+VAT</sup>
- Triumph Adler notebook, 486sx25, 120Mb HD, mono screen .....£649.00<sup>+VAT</sup>
- Triumph Adler notebook, 486sx25, 120Mb HD, colour screen .....£949.00<sup>+VAT</sup>
- Amstrad Penpad .....£149.00<sup>+VAT</sup>

- 250Mb tape streamer (internal) .....£89.00<sup>+VAT</sup>
- 250Mb tape streamer (external) .....£199.00<sup>+VAT</sup>
- 800dpi handscanner .....£59.00<sup>+VAT</sup>
- Handscanner, 400dpi mono .....£45.00<sup>+VAT</sup>
- Handscanner, 400dpi mono (new - limited stocks) .....£53.00<sup>+VAT</sup>
- Colour handscanner .....£99.00<sup>+VAT</sup>
- A4 colour scanner .....£329.00<sup>+VAT</sup>
- Sony/Panasonic CD-ROM drives, internal units .....£49.00<sup>+VAT</sup>
- Longshine 10Base2 network card (new) .....£35.00<sup>+VAT</sup>
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- Pace linnet 32 (external) (new) .....£169.00<sup>+VAT</sup>
- Pace linnet 32plus (ext.) (new) high spec. V32bis modem (14400bps) .....£299.00<sup>+VAT</sup>
- Dowty UPS - 400VA .....£79.00<sup>+VAT</sup>
- Dowty UPS - 1200VA .....£249.00<sup>+VAT</sup>
- 200Mb IDE hard disk .....£99.00<sup>+VAT</sup>
- 420Mb IDE hard disk .....£139.00<sup>+VAT</sup>
- 620Mb IDE hard disk .....£279.00<sup>+VAT</sup>

Please contact our Evesham branch for these products. All are clearance lines, shop soiled or second hand stock and carry 12 months warranty. More clearance bargains are held at our other branches - please call them if you do not see what you require.

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WINNER OF ALL CUSTOMER SERVICE CATEGORIES IN THE 'PC DIRECT HITS AWARDS' FOR '93 AND '94



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Send Cheque, Postal Order or Access/Visa/Switch/AmEx card details to:

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Unit 9, St Richards Road,  
Evesham, Worcs. WR11 6TD

## - DELIVERY -

Same day despatch whenever possible.

Delivery on orders up to £150.00 ex VAT value is charged at £3.50 +VAT. All items above this value are shipped by Insured Express Courier service at £6.50 +VAT per order - normally next working day after despatch (UK mainland only, others please call).

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Always a good sign.

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| BIRMINGHAM   | MILTON KEYNES   |
|--|---|
| 251-255 Moseley Rd,<br>Highgate<br>Birmingham B12 0EA<br>☎ 0121-446 5050<br>fax: 0121 446 5010 | 320 Wilton Gate,<br>Milton Keynes<br>MK9 2HP<br>☎ 01908-230898<br>fax: 01908 230865 |



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**01386-769403** Monday to Friday, 10.00 - 5.00

1 YEAR WARRANTY ON ALL GOODS

All goods subject to availability. Please note that On-site Maintenance applies to UK mainland only. Details correct at time of going to press. Prices and specifications subject to change without notice. E & O.E.

THIS ADVERT IS EFFECTIVE FROM 1/4/95  
SOME PRICES AND SPECIFICATIONS MAY CHANGE AFTER 30/4/95





# TECHNOMATIC

Techno House, 468 Church Lane, London NW9 8UF

PRICES EXCLUDE VAT @ 17.5%

## Hours of Business:

Mon-Fri: 9.15am to 5.45pm

Sat: 10am to 5.00pm

Callers welcome, please check availability.

Hewlett-Packard

## HEWLETT-PACKARD - THE FINEST PRINTERS

### NEW HP DESKJET 540



£215

#### The budget professional quality printer

- The new HP Deskjet 540 offers excellent black print at upto 3ppm and the option to upgrade to full colour printing, combining the capabilities of the HP Deskjet 520 and HP Deskjet 500c into one desktop unit at a budget price.
- ☆ 600x300dpi with HP REt quality black print
  - ☆ Low cost colour option
  - ☆ Easy to use - 2 buttons
  - ☆ New, softer styling, quiet mechanism
  - ☆ Paper (up to A4) with built-in tray
  - ☆ 3 yr RT-HP warranty with 3 yr HP SupportPack option

**HP DESKWRITER 540**  
**HP COLOUR OPTION KIT**

**£215(a)**  
**£31(c)**

Number  
**1**

We  
**know**  
**HP**

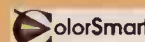
### NEW HP DESKJET 660C



£335

#### The perfect choice for black & colour printing.

- The new HP Deskjet 660C sets a new standard for black quality and offers ready colour with HP ColorSmart technology.
- ☆ 600dpi<sup>2</sup> black printing with HP REt
  - ☆ Holds tri-colour cartridge as well
  - ☆ new black ink - sharper, blacker with less bleed
  - ☆ Colour at 300dpi<sup>2</sup> with HP ColorSmart technology
  - ☆ Paper (up to A4) and transparencies with built-in tray
  - ☆ 3 yr RT-HP warranty with 3 yr HP SupportPack option



**HP DESKWRITER 660C**

**£349(a)**

### HP DESKJET 320



£170

3yr  
OSM  
£39

- ☆ Fully featured 600x300 dpi black text with built-in & TrueType fonts
- ☆ 300x300 dpi colour with optional colour kit
- ☆ Highly portable form with battery option
- ☆ 1 year RT-HP warranty with 3 yr HP SupportPack option



**HP DESKJET 320+CSF**

**£189(a)**

LATEST  
PRODUCT

Good  
Prices

### HP DESKJET 1200C

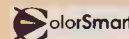


£645

3yr  
OSM  
£98

#### The original office printer with colour

- ☆ 600x300dpi black with HP REt
- ☆ 300 dpi<sup>2</sup> colour, HP ColorSmart
- ☆ Excellent on plain paper
- ☆ PCL5/PC, PostScript Option (C/PS)
- ☆ Pantone support, 2MB RAM, 4 cartridges
- ☆ HP MIO slots for expansion
- ☆ 1yr RT-HP warranty with 3yr HP SupportPack option



**HP DESKJET 1200C/PS (MAC/PC) £999(a)**

### HP LASERJET 4L



£355

3yr  
OSM  
£90

- ☆ 300dpi with HP REt
- ☆ 4ppm, 1Mb RAM
- ☆ PCL5e, Postscript option (M) for Mac
- ☆ 1 year return to HP warranty

#### IDEAL PERSONAL PRINTER

**HP LASERJET 4ML**

**£735(a)**

### HP LASERJET 4Plus



£950

3yr  
OSM  
£155

- ☆ 12ppm @ 600dpi, 2Mb RAM exp to 34Mb
- ☆ HP REt & Microfine toner
- ☆ Economode printing
- ☆ HP MIO slot for simple network connectivity
- ☆ Duplex option (Requires extra memory)
- ☆ 1yr RT-HP warranty

**HP LASERJET 4MPlus £1260(a)**

### A BETTER WAY

**HP Resolution Enhancement technology**  
HP REt intelligently adds and deletes dots and varies dot size to create smoother, sharper edges.

**HP Colour Resolution Enhancement technology (HP C-REt) & HP ColorSmart technology**  
Together they provide intelligent use of colour, contrasting, matching and rendering, improving the colour dimension of the printer.

**New pigment inks and reduced drop size**  
The new inks bleed much less, with vibrant colours and deeper blacks.

**Optimisation for plain paper**  
Developed by HP to optimise output on normal bond paper, thus significantly reducing printing costs.

**Speed of processing**  
By understanding your requirements HP offer speed and quality colour printouts.





## GREAT HOTELS OFFER

Enjoy the fresh air and beauty of the countryside with complimentary accommodation up to a value of £250 in any one of over 100 leading independent country hotels. See page 4 for details.



Access



Amex Surcharge 1%



0181-205 9558



24 hours  
0181-205 0190

PRICES EXCLUDE VAT @ 17.5%



## BUY THE BEST - BUY HEWLETT-PACKARD

### NEW HP DESKJET 850C



#### The perfect professional personal printer

An incredible standard of black and colour print, on plain paper, and good performance levels with dual PC/Macintosh connection as standard. Why buy laser? Buy colour!

- ☆ 600dpi<sup>2</sup> black with HP RET and smaller drop size
- ☆ 300dpi<sup>2</sup> colour with HP C-RET and HP ColorSmart
- ☆ Superb new inks raise print beyond laser quality!
- ☆ Fast black (up to 6ppm) and colour (up to 2ppm)
- ☆ Dual I/O for PC and Mac
- ☆ 1 yr RT-HP warranty with 3 yr HP SupportPack option



If you only buy one printer, buy this one  
If you can buy more, take this one home.

Number  
**1**

### NEW HP LASERJET 5P



#### Setting the standard for personal laser printers

The new HP LaserJet 5P and HP LaserJet SMP printers bring to the personal use level some unique new technologies and ease of use features yet still retain HP's industry leading print quality and product reliability.

- ☆ 600dpi<sup>2</sup> with HP RET and microfine toner
- ☆ Fast 6ppm (A4) with 2MB RAM
- ☆ Dual paper bins and manual feed option
- ☆ Multiple paper sizes: 3"x5" up to 8.5"x14"
- ☆ Straight path with rear tray for heavier media
- ☆ Infra-red port - ideal for compatible notebooks
- ☆ HP FontSmart for Windows - management s/w with extra fonts
- ☆ 1 yr RT-HP warranty with 3 yr HP SupportPack option

HP LASERJET 5MP (MAC/PC) £710(a)

### HP COLOR LASERJET



3yr  
OSM  
£1280

### LASER QUALITY COLOUR WITH HP ColorSmart TECHNOLOGY

- ☆ Superb CMY-B colour process
- ☆ 300 x 300 dpi LaserJet resolution
- ☆ 2ppm (A4) colour & 10ppm (A4) B&W
- ☆ A3/Tabloid option in B&W
- ☆ EPA EnergyStar<sup>TM</sup> approved, 1 yr OSM

HP Color LaserJet printer

£4399(\*)

COMPLETE  
RANGE

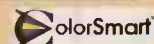
We  
know  
HP

Large  
Stocks

### NEW HP DESKJET 1600C



£875



#### The networkable office printer with colour

The new HP Deskjet 1600C and HP Deskjet 1600CM printers raise the choice of office printers past laser printers by offering fast true print quality black and colour with high volume, network capability. Don't print a thousand black copies, mix it with colour!

- ☆ 600dpi<sup>2</sup> black printing with HP RET & reduced drop size
- ☆ PCL 5C/E offers hassle-free compatibility with HP LaserJet 4 series
- ☆ Superb colour with new inks and a built-in heater - ready to go output
- ☆ Fast black (up to 8ppm) and colour (up to 4ppm)
- ☆ Network (& Mac) ready model has Adobe PostScript level 2 & 6MB RAM
- ☆ 1 yr RT-HP warranty with 3 yr HP SupportPack option

HP DESKJET 1600CM (NW/MAC) £1275(2xa)

### HP SUPPORTPACK

### HP LASERJET 4Si

### HP LASERJET 4V



3

YEARS  
ON-SITE  
MAINTENANCE  
(OSM)  
BY  
HP

This is the office standard bearer. Superb 600x600dpi with HP RET, high capacity, very expandable and outstanding reliability.



3yr  
OSM  
£459

- ☆ Fast 16ppm @ 600dpi & HP RET
- ☆ Host of media handling options
- ☆ Available as a PostScript & network-ready model (MX)
- ☆ 1 yr OSM warranty with 3yr option

HP LaserJet 4Si

£2099\*

HP LaserJet 4SiMX

£2979\*

This is the ultimate A3 printer with HP RET, 600x600dpi resolution to artwork quality output.



3yr  
OSM  
£200\*

- ☆ A3, A4, A5, A6 & envelopes
- ☆ Fast 16ppm A4 & 8ppm A3
- ☆ 120 levels of grey at 106 lines per inch
- ☆ PostScript & Apple Mac versions available
- ☆ 1 yr RT-HP warranty with 3yr OSM option

HP LaserJet 4V (PC)

£1370\*

HP LaserJet 4MV (PC/Mac)

£1989\*

### ACCESSORIES

See page 11 of our advertisement for a list of consumables, upgrades and accessories for HP printers and plotters. We have a comprehensive consumables catalogue - please call if you would like a copy.

Government, Colleges, Schools, Hospitals, Local Councils, Large PLC etc, official orders welcome. Minimum credit card order value £20 (ex P&P & VAT). Please ensure the suitability of products with the manufacturer before ordering. All trademarks are acknowledged. Errors & omissions excepted. Prices exclude VAT @ 17.5%.





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Hewlett-Packard

## COMPUTERS & PERIPHERALS - BY HP

### HP NOTEBOOKS



#### HP Omnibook 600

- ☆ Weighs only 3.3lbs
- ☆ 8.5" colour screen
- ☆ Full size keyboard
- ☆ 4/50 or 4/75 CPUs
- ☆ Highly portable
- ☆ 3yr RT-HP warranty



#### HP Omnibook 4000

- ☆ 10.3" colour screen
- ☆ 4/50 or 4/100 CPUs
- ☆ 4 or 8Mb Ram
- ☆ Large HDs
- ☆ Weighs less <7lbs
- ☆ 16bit stereo sound

|                    |                       |          |
|--------------------|-----------------------|----------|
| HP Omnibook 600C   | 4/50, 4, 170, colour  | £1599(a) |
| HP Omnibook 600C   | 4/75, 8, 260, colour  | £2199(a) |
| HP Omnibook 4000C  | 4/50, 4, 260, DSCol   | £1939(a) |
| HP Omnibook 4000C  | 4/50, 8, 340, DSCol   | £2130(a) |
| HP Omnibook 4000CT | 4/50, 8, 340, TFTCol  | £2765(a) |
| HP Omnibook 4000CT | 4/100, 8, 340, TFTCol | £3100(a) |
| HP Omnibook 4000CT | 4/100, 8, 520, TFTCol | £3385(a) |

### PERFORMANCE PCs



The new HP Vectra VE offers Intel Pentium 75MHz CPUs with PCI bus interconnection for the graphics and hard disk subsystems. To further increase performance, a secondary cache of 256 KB and video DRAM memory may be fitted. All HP Vectra VE Pentium PCs come with 8MB RAM as standard and MS DOS 6.2 with MS Windows for WorkGroups 3.1 pre-loaded.

The new HP Vectra VL Pentium PCs start with the HP Vectra VE systems and build in improvements to enhance performance without greatly increasing cost. Every HP Vectra VL Pentium system has a 256KB secondary cache, 8MB RAM expandable to 192MB, dual channel enhanced IDE, PCI expansion slots and an integrated 64bit graphics subsystem.

| Model                  | CPU | RAM(MB) | HD(MB) | Bus     | Price    |
|------------------------|-----|---------|--------|---------|----------|
| HP Vectra VE 5/75 P/75 |     | 8       | 270    | ISA     | £1079(a) |
| HP Vectra VE 5/75 P/75 |     | 8       | 540    | ISA     | £1139(a) |
| HP Vectra VL 5/75 P/75 |     | 8       | 420    | PCI/ISA | £1200(a) |
| HP Vectra VL 5/75 P/75 |     | 8       | 840    | PCI/ISA | £1295(a) |
| HP Vectra VL 5/90 P/90 |     | 8       | 420    | PCI/ISA | £1475(a) |
| HP Vectra VL 5/90 P/90 |     | 8       | 840    | PCI/ISA | £1560(a) |
| HP Vectra VL 5/90 P/90 |     | 16      | 840    | PCI/ISA | £1780(a) |

Note: Systems do not include a monitor.

### SCANNERS



#### HP SCANJET 3P

- ☆ Monochrome
- ☆ 300 dpi enhanced to 1200dpi
- ☆ Up to 12ppm Scan rate
- ☆ SCSI i/f for speed

HP PicturePlace - an image editor

Calera Wordscan 3.0 - an OCR package



#### HP SCANJET IICX

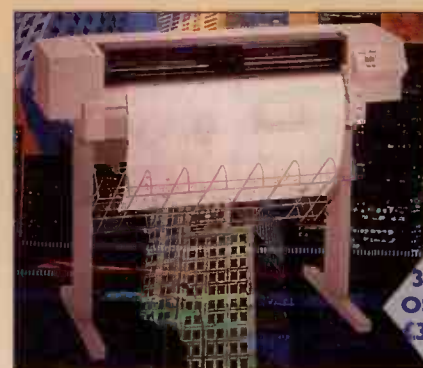
- ☆ Full colour
- ☆ 400 dpi enhanced to 1600dpi
- ☆ HP ColorSmart Support
- ☆ SCSI i/f for speed (PC/AT)

HP DeskScan II - easy to use scanning utility

Aldus PhotoStyler SE - a lite version

Calera Wordscan 3.0 - an OCR package

### HP PLOTTERS



- No Fuss
- No Mess
- No Pens

Sharper  
Faster  
Every time!

### THE BEST IN PROFESSIONAL CAD

#### HP DESIGNJET 220

- ☆ 600x600dpi Mono
- ☆ Approx 6 mins for A0 plot
- ☆ Tabletop standard, legs option
- ☆ AutoCAD & Windows drivers
- ☆ 2MB RAM Buffer
- ☆ RS232C & Centronics i/f
- ☆ 1yr OSM warranty

#### HP DESIGNJET 650C

- ☆ 600x600dpi Mono
- ☆ 300x300dpi Colour
- ☆ Auto-switching HP-GL/2 & HP-RTL
- ☆ AutoCAD & Windows drivers
- ☆ 4MB RAM buffer
- ☆ RS232C & Centronics i/f
- ☆ 1yr OSM warranty

|                      |       |
|----------------------|-------|
| HP DESIGNJET 220 A0  | £1995 |
| HP DESIGNJET 220 A1  | £1530 |
| HP DESIGNJET 650C A0 | £4599 |
| HP DESIGNJET 650C A1 | £3930 |

|                          |          |
|--------------------------|----------|
| HP DESIGNJET 220 Legs A0 | £1289(a) |
| HP DESIGNJET 220 Legs A1 | £1229(a) |

Call for carriage rates

## SUPERB SOFTWARE BUNDLE

Mac versions have different software

|   |   |
|---|---|
| HP SCANJET 3P £350(a)<br>A4 Scanner (PC/AT) | HP SCANJET IICX £649(a)<br>A4 Scanner (PC/AT) |
|---|---|

Auto Document Feeder  
£129(a)

Auto Document Feeder £349(a)  
Transparency Unit £449(a)



- Simply purchase any one of:-
- HP Printer (excluding HP Deskjets), Plotter or Scanner and its HP SupportPack
  - A complete Compaq, IBM or HP Computer System
  - Over £500 (excl. carriage & VAT) of Software or Network Products or Multimedia Products or Storage Products or Modems

You must request your complimentary award with your order. Offer subject to availability. Its usage is governed by conditions as stated on the award. Conditions include paying for breakfast and dinner at the hotel, and some hotels list periods when reservations are not accepted. Only one award per order available whilst stocks last.



0181-205 9558



0181-205 0190

PRICES EXCLUDE VAT @ 17.5%



## THE AFFORDABLE PREMIUM BRAND - HP

### HP VECTRA VL2

This is the best-selling range of desktop PCs from Hewlett-Packard. It is the most affordable premium brand offering unrivalled value without cutting corners. Every machine carries a 3 year warranty with the first year having on-site maintenance by HP engineers. This warranty will also cover 14" or 15" HP monitors (optional) purchased with the computer.

The Economy range offers entry-level computing whilst the Standard range offers higher specification computing and greater upgradability.

Both ranges come pre-loaded with MS Windows for WorkGroups 3.11 giving easier and cheaper networking options for the small office or department. A range of high quality, flicker-free monitors are available to provide the ideal match for your requirements. All computers are EPA Energy Star compliant.



### MONITORS

|                            |         |
|----------------------------|---------|
| HP 14" VGA mono            | £149(a) |
| HP 14" SVGA colour         | £195(a) |
| HP 14" Ergo SVGA colour    | £235(a) |
| HP 14" SVGA ES colour      | £220(a) |
| HP 15" Ergo Ultra SVGA col | £342(a) |
| HP 17" Ergo UVGA col       | £655(a) |

### ECONOMY RANGE

|            |           |         |
|------------|-----------|---------|
| VL2 4/50se | 4/210/DWW | £655(a) |
| VL2 4/50se | 4/340/DWW | £685(a) |
| VL2 4/50e  | 4/210/DWW | £685(a) |
| VL2 4/50e  | 4/340/DWW | £719(a) |
| VL2 4/66e  | 4/210/DWW | £719(a) |
| VL2 4/66e  | 4/340/DWW | £749(a) |

### STANDARD RANGE

|                           |           |          |
|---------------------------|-----------|----------|
| VL2 4/50                  | 8/270/DWW | £865(a)  |
| VL2 4/50                  | 8/540/DWW | £930(a)  |
| VL2 4/66                  | 8/270/DWW | £899(a)  |
| VL2 4/66                  | 8/540/DWW | £960(a)  |
| VL2 4/100                 | 8/270/DWW | £1040(a) |
| VL2 4/100                 | 8/540/DWW | £1095(a) |
| HP Supportpack - 3 yr OSM |           | £115(a)  |

### NETSERVERS

HP Servers feature built-in Automatic Server Restart capability, without administrator intervention, in the event of a hang. Further availability features include a temperature monitor which can warn of potential system overheat.

Control is available via the HP Netserver Assistant 2.1 software which provides a proactive system alerting and resolution. To aid in problem resolution every server is supplied with HP Support Assistant - a mine of technical information. VDU extra.



### HP NETSERVER LC

- ☆ File/Print Applications
- ☆ Intel 486DX2 & Pentium® CPUs
- ☆ Fast SCSI-2, PCI, EISA
- ☆ 4 bay deskside case
- ☆ 3 year OSM by HP

### HP NETSERVER LF

- ☆ Client/Server Applications
- ☆ Intel 486DX2 & Pentium® CPUs
- ☆ PCI, EISA & SCSI-2
- ☆ Drive array options
- ☆ 3 year OSM by HP

### HP NETSERVER LM

- ☆ Scaleable Client/Server
  - ☆ Intel 486DX2 & Pentium® CPUs
  - ☆ EISA, Fast SCSI-2, & IDE
  - ☆ ECC Ram, Hot-Swap array options
  - ☆ 3 year OSM by HP
- Pentium is a trademark of Intel Corp

### STANDARD SERVERS

|              |              |           |       |
|--------------|--------------|-----------|-------|
| HP Netserver | 4/66LC-540   | 8/540/-   | £1675 |
| HP Netserver | 4/100LC-1050 | 8/1Gb/-   | £1915 |
| HP Netserver | 4/100LF-1050 | 8/1Gb/CD  | £2615 |
| HP Netserver | 5/66LF-1050  | 16/1Gb/CD | £3095 |
| HP Netserver | 5/66LM-1050  | 16/1Gb/CD | £4059 |
| HP Netserver | 5/100LM-1    | 16/None/- | £4450 |

### ARRAY SERVERS

|                                      |                 |               |       |
|--------------------------------------|-----------------|---------------|-------|
| HP Netserver                         | 4/66LF-1 Array  | 8/Chassis/CD  | £2990 |
| HP Netserver                         | 4/100LF-1 Array | 8/Chassis/CD  | £3320 |
| HP Netserver                         | 4/66LM-2000     | 16/2*1'Gb/CD  | £6199 |
| HP Netserver                         | 5/60LM-2000     | 16/2*1'Gb/CD  | £6099 |
| HP Netserver                         | 5/66LM-1 Array  | 16/Chassis/CD | £4899 |
| HP Netserver                         | 5/66LM2-1       | 16/None/-     | £5699 |
| HP Remote Assistant (Requires Modem) |                 |               | £697  |

### PERSONAL BACKUP

#### The Tape Drives (a)

|                 | 250  | 350    | 750  | 350      | 750  |
|-----------------|------|--------|------|----------|------|
| Internal        | .    | .      | .    | .        | .    |
| External        | .    | .      | .    | .        | .    |
| Interface       |      | Floppy |      | Parallel |      |
| Software        | .    | .      | .    | .        | .    |
| Format          |      |        |      |          |      |
| QIC-40          |      | R/O    | R/O  | R/O      |      |
| QIC-80          | R/W  | R/W    | R/O  | R/W      |      |
| QIC-80XL        |      | R/W    |      | R/W      |      |
| QIC-3010        |      |        | R/W  |          | R/W  |
| Normal Cap.(MB) | 125  | 170    | 340  | 170      | 340  |
| Max.Cap (MB)    | <250 | <340   | <680 | <340     | <680 |
| Warranty (RT-B) | 1yr  | 2yr    | 2yr  | 1yr      | 2yr  |
| Price           | £92  | £103   | £165 | £205     | £275 |

#### The Tapes(b)

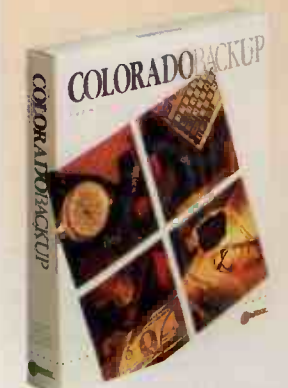
| Colorado     | 3-pk | 3M        | each    | 5-pk      |
|--------------|------|-----------|---------|-----------|
| DT-250 fme'd | £45  | DC2120    | unfme'd | £9.75 £45 |
| DT-350 fme'd | £54  | DC2120XXL | unfme'd | £14 £66   |
| DT-740 fme'd | £69  | MC3000XL  | unfme'd | £21 £100  |

#### The Software

£49(b)

Colorado Backup for Windows works with all Colorado tape drives and uses industry standard QIC and DDS formats. In addition, it supports most popular PC networks (upto Novell NetWare 3.x).

- Drag & Drop operation
- Automation capability
- Data Compression
- Runs in background



### HIGH CAPACITY BACKUP

#### WORLD LEADER IN DAT BACKUP



Conservative estimates state that:  
"After 1 year of use the data on your hard disk is worth 10 times the computer"

PROTECT YOUR INFORMATION

BACK IT UP

- ☆4Gb to 16Gb capacity (120m tape)\*
- ☆510Kb/s sustained transfer rate\*
- ☆8Gb in approx. 2 hours\*
- ☆Find any file in 40 seconds
- ☆PC kits includes:-

Drive Unit  
SCSI Cable

Host Bus Adapter  
Cheyenne Arcserve/Arcsolo

HP JetStore 6000\*  
HP JetStore 5000  
HP JetStore 2000

Drive only  
Drive only  
Drive only

from £855(a)  
from £735(a)  
from £645(a)





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Compaq

## The No. 1 Personal Computer maker

**COMPAQ**

### PROLINEA

#### High performance at entry level prices



The new Compaq Prolinea range boasts some key high-end technology from the Deskpro range as well as some new use-ability features, eg TriFlex/PCI architecture to realise optimum performance, PCI LB graphics and Enhanced IDE. Plug and Play compatible, Auto config for Compaq IDE HDs. MS-DOS 6.2 and MS Windows 3.1 are pre-loaded. All Prolineas carry a 3 year warranty. Pentium is a trademark of Intel Corp.

| Model | CPU        | RAM(MB) | HD(MB) | Case | Price           |
|-------|------------|---------|--------|------|-----------------|
| 4/50  | 486DX2-50  | 4       | 270    | 3x3  | <b>£745(a)</b>  |
| 4/66  | 486DX2-66  | 8       | 270    | 3x3  | <b>£975(a)</b>  |
| 4/66  | 486DX2-66  | 8       | 420    | 4x4  | <b>£1065(a)</b> |
| 4/100 | 486DX4-100 | 8       | 270    | 3x3  | <b>£1135(a)</b> |
| 4/100 | 486DX4-100 | 8       | 420    | 4x4  | <b>£1235(a)</b> |
| 5/75  | Pentium-75 | 8       | 270    | 3x3  | <b>£1245(a)</b> |
| 5/90  | Pentium-90 | 8       | 420    | 4x4  | <b>£1495(a)</b> |

### DESKPRO

#### The manageable choice for networks



The new Compaq DeskPro range addresses the key issue facing PC networks - manageability. Every DeskPro is network ready (Ethernet) and features Compaq AssetControl - a unique means of identifying equipment spec down to serial numbers, revision numbers and configuration. MS-DOS 6.2, MS Windows and Network Setup Utility (Netware) are provided. All DeskPros carry a three year limited warranty. Asset management monitors are available separately.

| Model | CPU        | RAM(MB) | HD(MB) | Case | Price           |
|-------|------------|---------|--------|------|-----------------|
| 4/66  | 486DX2-66  | 8       | 270    | 3x3  | <b>£1125(a)</b> |
| 4/100 | 486DX4-100 | 8       | 270    | 3x3  | <b>£1295(a)</b> |
| 4/100 | 486DX4-100 | 8       | 420    | 4x4  | <b>£1395(a)</b> |
| 5/75  | Pentium-75 | 8       | 270    | 3x3  | <b>£1475(a)</b> |
| 5/75  | Pentium-75 | 8       | 420    | 4x4  | <b>£1579(a)</b> |
| 5/90  | Pentium-90 | 8       | 420    | 4x4  | <b>£1750(a)</b> |
| 5/90  | Pentium-90 | 16      | 720    | 5x5  | <b>£2100(a)</b> |

### OTHER RANGES

We are authorised Compaq dealers and can supply from the existing ranges ie LTE Elite, Presario, DeskPro XE & XL, ProSignia V5 and Proliant. We are also able to offer lease finance (subject to status) for orders in excess of £1000.

|               |               |              |               |
|---------------|---------------|--------------|---------------|
| Contura Aero  | from £879(a)  | LTE Elite    | from £2285(a) |
| Ehn. Prolinea | from £670(a)  | ProSignia V5 | from £1499(a) |
| Proliant      | from £4239(a) |              |               |

### COMPAQ WARRANTY

Please note that the on-site maintenance warranty service for Compaq products is through Compaq appointed Service Providers. This on-site maintenance service is also intended to address 'DOA' situations. Compaq notebooks do not carry an on-site warranty. Technomatic provide a 12 month RTB warranty as standard and can supply a 3yr on-site maintenance enhancement on certain products. Please call for details.

### MONITORS

Compaq monitors are specified according to user choice and so are not included with the systems advertised. Asset management capable monitors are also available.

|                 |         |                 |         |
|-----------------|---------|-----------------|---------|
| 14" VGA colour  | £170(a) | 14" SVGA colour | £209(a) |
| 14" 1024 colour | £250(a) | 15" SVGA colour | £349(a) |
| 17" SVGA colour | £675(a) |                 |         |

### THINKPADS

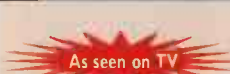


|                | CPU        | Screen    | RAM | HD  |                  |
|----------------|------------|-----------|-----|-----|------------------|
| ThinkPad 340   | 486SLC2-50 | 9.5" Mono | 4   | 125 | <b>£895(a)</b>   |
| ThinkPad 360   | 4/33s      | 9.5" Mono | 4   | 170 | <b>£1075(a)</b>  |
| ThinkPad 360   | 4/33s      | 8.4" TFT  | 4   | 170 | <b>£1690(a)</b>  |
| ThinkPad 360   | 4/50       | 8.4" TFT  | 4   | 340 | <b>£2115(a)</b>  |
| ThinkPad 755   | 4/75       | 9.5" DCS  | 4   | 340 | <b>£2968(2a)</b> |
| ThinkPad 755   | 4/75       | 10.4" TFT | 4   | 170 | <b>£3495(2a)</b> |
| ThinkPad 755CE | 4/100      | 10.4" TFT | 8   | 340 | <b>£4495(2a)</b> |
| ThinkPad 755CD | 4/100      | 10.4" TFT | 8   | 540 | <b>£5499(2a)</b> |

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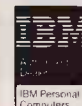
The Aptiva - a modern, state-of-the-art range of computers designed for you, designed to perform, designed to be the best value package from IBM. Each Aptiva has class leading software - from PC DOS v6.3, MS Windows v3.1 and MS Works to IBM's Learning Library, Personal Desktop, Custom Tools & First Steps. Every Aptiva comes with free membership of Helpware with access to the best 24 hour, 365 day telephone helpline. Aptiva comes complete with keyboard, mouse & 14" SVGA screen.

#### STANDARD

|            |                   |                  |
|------------|-------------------|------------------|
| Aptiva 745 | 4/50s, 4, 270, Sp | <b>£699(2a)</b>  |
| Aptiva 767 | 4/50, 4, 270, Sp  | <b>£729(2a)</b>  |
| Aptiva 788 | 4/66, 4, 540, Sp  | <b>£885(2a)</b>  |
| Aptiva 792 | 4/66, 8, 540, Sp  | <b>£1039(2a)</b> |
| Aptiva 798 | P/60, 8, 540, Sp  | <b>£1299(2a)</b> |

#### MULTIMEDIA

|            |   |                  |
|------------|---|------------------|
| Aptiva 855 | 4/50, 4, 270, Sp + MMI - Call for spec. | <b>£959(2a)</b>  |
| Aptiva 888 | 4/66, 4, 540, Sp + MMI - Call for spec. | <b>£1080(2a)</b> |
| Aptiva 857 | 4/66, 8, 540, Mt + MM2 - Call for spec. | <b>£1269(2a)</b> |



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|---------------------------------|-------------|-------------------|----------------|------------|---------------|------------|---------------|-----------|-----|---------|-------------|------------|------|--------------|-------------|---------------|---------------|--------|--------|
|                                 | 28800 (V34) | 19200 (V32 turbo) | 14400 (V32bis) | 9600 (V32) | 2400 (V22bis) | 1200 (V22) | 1200/75 (V23) | 300 (V21) | V42 | MNP 2-4 | V42bis      | MNP 5      | 9600 | 14400 (V17)  | SYNCHRONOUS | DESKTOP (EXT) | PC CARD (INT) | POCKET | PCMCIA |
| SPORTSTER 28.8 + FAX            | ✓           | ✓                 | ✓              | ✓          | ✓             | ✓          | ✓             | ✓         | ✓   | ✓       | ✓           | ✓          | ✓    | ✓            | ✓           | ✓             | ✓             | ✓      | ✓      |
| SPORTSTER 14.4 + FAX            |             |                   | ✓              | ✓          | ✓             | ✓          | ✓             | ✓         | ✓   | ✓       | ✓           | ✓          | ✓    | ✓            | ✓           | ✓             | ✓             | ✓      | ✓      |
| COURIER V34                     | ✓           | ✓                 | ✓              | ✓          | ✓             | ✓          | ✓             | ✓         | ✓   | ✓       | ✓           | ✓          | ✓    | ✓            | ✓           | ✓             | ✓             | ✓      | ✓      |
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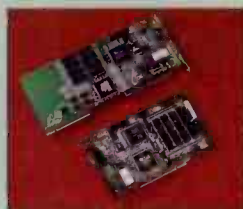
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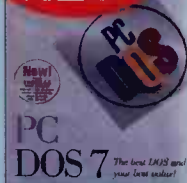
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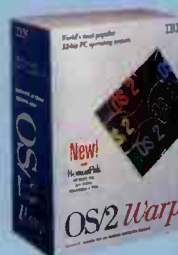
### System Requirements

- Memory Requirements - 512KB minimum • Works on any IBM compatible PC
- System Requirement - Intel 8088 or 80X86 or higher microprocessor or compatible
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IBM PC-DOS v7

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## IBM WIN-OS/2 includes FREE Bonus Pak



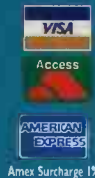
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|---------------------|------------------|--------------|-------|------------------------|------------|------------|------------------------|------|-------|-----------|-------|-------|-------|-------|
| HP LaserJet 4L      | 4ppm/<br>300dpi  | 1Mb/<br>265  | PCL5e | BiPar                  | £355       | £445       | SuperScript 610+ New   | A4   | 6ppm  | 300x300   | 256kb | G     | B     | £295  |
| HP LaserJet 5P New  | 6ppm/<br>600dpi  | 2Mb/<br>455  | PCL5e | Par/Ser                | £595       | Call       | SuperScript 660 New    | A4   | 6ppm  | 1200x600  | 256kb | G     | B     | £429  |
| HP LaserJet 5MP New | 6ppm/<br>600dpi  | 6Mb/<br>805  | PCL5e | Par/Ser                | £710       | Call       | SuperScript 660i New   | A4   | 6ppm  | 1200x600  | 256kb | G,PS  | B     | £575  |
| HP LaserJet 4 Plus  | 12ppm/<br>600dpi | 2Mb/<br>455  | PCL5e | BiPar/Ser              | £950       | £1105      | SuperScript Color 3000 | A4   | 1ppm  | 300x300   |       | G     | B     | £649  |
| HP LaserJet 4M Plus | 12ppm/<br>600dpi | 6Mb/<br>805  | PCL5e | BiPar/Mac/<br>Ethernet | £1260      | £1415      | EPSON 1 year OSM       |      |       |           |       |       |       |       |
| HP LaserJet 4V A3   | 16ppm/<br>600dpi | 4Mb/<br>455  | PCL5e | BiPar/Ser              | £1370(3xa) | £1570(3xa) | EPL3000 New            | A4   | 4ppm  | 300       | 1Mb   | 5e    | B     | £390  |
| HP LaserJet 4MV A3  | 16ppm/<br>600dpi | 12Mb/<br>805 | PCL5e | BiPar/Mac/<br>Ethernet | £1989(3xa) | £2189(3xa) | EPL5200                | A4   | 6ppm  | 300       | 1Mb   | PS    | PS    | £465  |
| HP LaserJet 4Si     | 16ppm/<br>600dpi | 2Mb/<br>455  | PCL5e | BiPar                  | £2099(3xa) | £2558(3xa) | EPL5600                | A4   | 6ppm  | 600       | 2Mb   | 5e    | B,S   | £599  |
| HP LaserJet 4Si MX  | 16ppm/<br>600dpi | 10Mb/<br>805 | PCL5e | BiPar/Mac/<br>Ethernet | £2979(3xa) | £3438(3xa) | EPL9000 New            | A3   | 8ppm  | 600       | 2Mb   | 5e    | B,S   | £1199 |
|                     |                  |              |       |                        |            |            | EPL9000PS New          | A3   | 8ppm  | 600       | 6Mb   | 5e,PS | B,S,A | £1549 |
|                     |                  |              |       |                        |            |            | PANASONIC              |      |       |           |       |       |       |       |
|                     |                  |              |       |                        |            |            | KXP4400 1yr OSM        | A4   | 4ppm  | 300       | 512Kb | P4    | P     | £289  |
|                     |                  |              |       |                        |            |            | KXP4401 1yr OSM        | A4   | 4ppm  | 300       | 512Kb | P5    | P     | £359  |
|                     |                  |              |       |                        |            |            | KXP4430 2yr OSM        | A4   | 5ppm  | 300       | 1Mb   | PS    | PS    | £485  |
|                     |                  |              |       |                        |            |            | KXP4440 2yr OSM        | A4   | 10ppm | 300       | 1Mb   | P4    | PS    | £739  |
|                     |                  |              |       |                        |            |            | KXP5400 1yr OSM        | A4   | 4ppm  | 300       | 2Mb   | P4,2S | PA    | £545  |

I/F:- P=Parallel, B=Bi-directional Parallel, S=Serial, A=AppleTalk  
Lang:- G=GDI (Win 3.1), P4=HP PCL4, P5=HP PCL5e, PS=PostScript, S2=PostScript Level 2

## COMPATIBLE LASER RAM UPGRADES (b) Please phone for latest prices

| FOR HEWLETT-PACKARD                  | FOR EPSON                                     | FOR PANASONIC                       |
|--------------------------------------|---|-------------------------------------|
| 4*(M,M+,P,V,S) II IIP,IIIP, 4L XL300 | 4000,4100 5000,5200 5600 EPL8000 ActionLaser+ | 4410,4430 4420,4450i 4440 4400 4500 |
| 1Mb £45 £65 £59 £65 £149             | 4300 8100 EPL6000                             | 4451 4510                           |
| 2Mb £85 £95 £89 - £185               | £62 £55 £45 £62 -                             | £89 £69 £72 £65 -                   |
| 3Mb - - - - £159                     | £109 £89 £85 £109 £89                         | £129 £109 £109 £95 £95              |
| 4Mb £129 £159 £155 - £225            | £159 - £159 -                                 | - - - - -                           |
| 8Mb £255 - - - £355                  | £199 £185 £129 £199 £159                      | £199 £179 £193 £175 -               |

All prices include expansion card where needed (Please see our memory page for more memories)

## TONER CARTRIDGES(b)

| HEWLETT-PACKARD              | NEC                 | EPSON              | PANASONIC |
|------------------------------|---------------------|--------------------|-----------|
| LaserJet 11P/11P+/11P/11D    | 4410/4430 Developer | EPL 7100/7500/8100 | 4410/4430 |
| LaserJet 4/4+/4M/4M+         | 4420 Drum           | EPL 4000/4100/4300 | 4420 Drum |
| LaserJet 4V/4VM              | 4420 Developer      | EPL 5000/5200      | 4420 Drum |
| LaserJet 11Si/11Si+/11Si/11D | 4400/4500 Drum      | EPL 5600           | 4420 Drum |
| LaserJet 4L/4L+/4L/4M/4MP    | 4400/4500 Drum      | LEXMARK            | 4420 Drum |
|                              |                     | 610                |           |
|                              |                     | LEXMARK            |           |
|                              |                     | 4039 Toner         |           |
|                              |                     | 4029 Toner         |           |
|                              |                     | CANON              |           |
|                              |                     | LPB 4              |           |
|                              |                     | LPB 8 MKII/III     |           |
|                              |                     |                    |           |
|                              |                     |                    |           |

## INKJET PRINTERS(a)

| Colour Inkjet printers        | Price       | Cartridges |
|-------------------------------|-------------|------------|
| Canon BJC4000 (A4)            | £275        | Blk/Colour |
| Canon BJC600 (A4) (see below) | £339        | £6 £7*     |
| Canon BJC800 (A3)             | £1070       | £14 £18*   |
| Epson Stylus Colour (A4)      | £332        | £14 £29    |
| HP Deskjet 320** (A4 Port)    | £170        | £13 -      |
| HP DJ320 + CSF (A4 Port)      | £189        | £13 -      |
| HP Deskjet 540C (A4)**        | £215        | £16 £16    |
| HP Deskjet 660C (A4)          | £335        | POA POA    |
| HP Deskjet 850C (A4)          | £399        | POA POA    |
| HP Deskjet 1200C (A4)         | £645        | £19 £22*   |
| HP Deskjet 1200C/PS (A4)      | £999        | £19 £22*   |
| HP Deskjet 1600C              | £875        | POA POA    |
| HP Deskjet 1600CM             | £1275       | POA POA    |
| HP PaintJet XL300 (A3)        | £1599       | £15 £17*   |
| Black Inkjet printers         |             |            |
| Canon BJ105X (A4 Port)        | £155 £14.50 | -          |
| Canon BJ200 (A4)              | £185        | £16 -      |
| Canon BJ230 (A3)              | £245        | £16 -      |
| Canon BJ300 (A4)              | £361        | £11 -      |
| Canon BJ330 TF (A3 Port)      | £423        | £11 -      |
| Epson Stylus 800+ (A4)        | £174        | £8.50 -    |
| Epson Stylus 1000 (A3)        | £315        | -          |

\*\*Requires optional colour kit \*Specify C/M/Y Cart

## CANON BJC600 COLOUR PRINTER

With 1 extra set of cartridges worth £27

While stocks last

£339

## NEW HEWLETT-PACKARD COLOUR LASERJET £4279(3xa)

## DOT MATRIX PRINTERS

### EPSON

| Model     | PIN | Col | Price | Blk Rib | Model         | PIN | Col | Price | Blk Rib |
|-----------|-----|-----|-------|---------|---------------|-----|-----|-------|---------|
| FX870     | 9   | 80  | £229  | £4.50   | LQ570+        | 24  | 80  | £192  | £5      |
| FX1170    | 9   | 136 | £289  | £6      | LQ870         | 24  | 80  | £355  | £5      |
| LX300     | 9   | 80  | £95   | £4.50   | LQ1070+       | 24  | 136 | £285  | £7      |
| LX1050    | 9   | 136 | £179  |         | LQ1170        | 24  | 136 | £405  | £7      |
| LQ100     | 24  | 80  | £105  | £5      | DFX5000+      | 9   | 136 | £1119 | £22.50  |
| LQ150 Col | 24  | 80  | £165  | £5.50   | SQ870 Inkjet  | 80  |     | £425  |         |
|           |     |     |       |         | SQ1170 Inkjet | 136 |     | £569  |         |

## PRINTER MEDIA(b)

| HP                             | CANON                     |
|--------------------------------|---------------------------|
| LX JETSeries Trans A4 50 shs   | BJ800C A4 Paper           |
| LX JETSeries Glossy A4 50 shs  | BJ800C A3 Paper           |
| CX JETSeries Coated A4 200 shs | BJ800C Transparency CF101 |
| CX JETSeries Coated A3 200 shs | BJ600C Transparency CF102 |
| LJ Transparencies A4 50 shs    | FARGO PRIMERA             |
| HP Labels various sizes        | Thermal Paper             |
| EPSON                          | Std A4 500 sheets         |
| STYLUS COLOUR COATED PAPER     | Premium A4 500 sheets     |
| 360 dpi A4 200 shs             | Special Long A4           |
| 720 dpi A4 200 shs             | Transparency A4 50 sheets |
| Transparencies A4              | A4 T-Shirt Transfer       |

## COLOUR THERMAL

### NEC SuperScript Color 3000 New! £649(a)

NEC's new (GDI) Windows colour thermal printer, suitable for all multimedia applications with up to 16.7 million colours, high quality performance and the ability to use plain paper.

### QMS magicolor plus laser printer £7950(2xa)

Magicolor plus combines the power of high resolution and laser sharp colour printer, which makes it ideal for business professionals, graphic artists, and network users, to affordably produce high quality laser text and graphics at 600x600dpi, and speeds up to 12ppm for text and 3-6ppm for full colour pages. (Please note network module is optional)

## PRINTER CABLES(c)

| Length | 25M/36M | 36M/36M | 25M/25M |
|--------|---------|---------|---------|
| 1.8m   | £4      | £6      | £4      |
| 3m     | £6      | £8      | £6      |
| 5m     | £7      | £10     | £7      |
| 10m    | £15     | £17     | £18     |

25M/36M is standard PC parallel cable 25/25 & 36/36 are for use with printer switches

## PAPER HANDLING

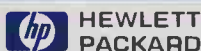
### EIT LASER TOWER for LJ4/4+

The Laser Tower System positions the printer on top of a stack of paper feeding cassettes. Each cassette will take a whole ream of paper - 500 sheets and the user can opt for selective feeding of different paper types.

3 paper cassettes laser tower £1999  
6 paper cassettes laser tower £3349

## PLOTTERS AND DIGITISING TABLETS

### HP PLOTTERS



| Size                | A1            | A0            |
|---------------------|---------------|---------------|
| DesignJet 220 Black | C3187A £1530* | C3188A £1995* |
| DesignJet 600 Black | C2847A £2875* | C2848A £3425* |
| DesignJet 650C Col  | C2858B £3930* | C2859B £4599* |
| DraftPro Plus       | C3170A £2339* | C3171A £3129* |

Draft Pro & Master comes with three years On Site Warranty.

DesignJet price includes one year OSM.

3 Year OSM Support Pack for DesignJet £300

\*Carriage on request.

### PLOTTER MEDIA(a)

|                               |     |
|-------------------------------|-----|
| HP Paper A0 150 sheets        | £64 |
| HP Paper A1 200 sheets        | £42 |
| HP Paper 36" Roll             | £29 |
| HP DJ650C Paper 24"x150ft     | £23 |
| HP DJ650C Paper 36"x150ft     | £29 |
| HP DJ650C Paper A1 100 sheets | £43 |
| HP DJ650C Paper A0 100 sheets | £83 |

### HP PLOTTER PENS(c)

|                                |               |
|--------------------------------|---------------|
| 1782SP, 1782BP, 1772ST, 1772BT | £6.30         |
| Ink Cartridges (c)Blk C/M/Y    |               |
| DesignJet 200/220              | £16           |
| DesignJet 600                  | £16           |
| DesignJet 650                  | £20.40 £20.40 |

## Summagraphics

### INKJET PLOTTERS

|                 | A1     | A0     |
|-----------------|--------|--------|
| SummaJet Mono   | £1869* | £2449* |
| SummaJet Colour | £2349* | £2685* |

Call for cartridges & paper

### DIGITISERS & TABLETS (L=Legs optional)

|                                  | A4      | A3      |
|----------------------------------|---------|---------|
| SummaSketch III                  | £235(a) | £455(a) |
| SummaSketch FX                   | £305(a) | £499(a) |
| Summa Grid IV 1824 A2 Tablet (L) | £959*   |         |
| Summa Grid IV 2436 A1 Tablet (L) | £1279*  |         |
| Summa Grid IV 3648 A0 Tablet (L) | £1695*  |         |
| Manual A1/A0 Tablet Floor Stand  | £195(a) |         |
| A2 Table Top Tilt Stand          | £120(a) |         |
| 4 Button Cursor                  | £148(a) |         |
| 16 Button Cursor                 | £135(a) |         |
| *Call for carriage               |         |         |

### GENIUS TABLETS



### HiSketch SP Model

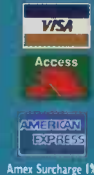
|                                   |         |
|-----------------------------------|---------|
| 1212 SP (12"x12")                 | £120(a) |
| 1812 SP (18"x12")                 | £185(a) |
| 1812D SP (18"x12") LCD coord disp | £210(a) |

### Features:-

- Windows 3.1 & ADI drivers • Up to 19,200 bps data rate
- 5 to 90 pairs/sec sampling rate
- 1000 lines per inch resolution
- ± 0.01 inch accuracy • Proximity sensing
- AutoCAD R10/11/12 compatible templates
- Multi-directional puck • 3 button stylus



# FRIENDLY SERVICE FRIENDLIER PRICES



**0181-205 9558**  
**0181-205 0190**



PRICES EXCLUDE VAT @ 17.5%

## A4 FLAT BED SCANNERS

### HP SCANNERS(a)

HP's AccuPage 2.0 technology enhances the performance of Calera WordScan now included as standard PC kits. Ilex Includes Deskscan II, Aldus Photostyle SE, SCSI card & cable (Mac versions are different).

|                                 |       |              |  |       |             |
|---------------------------------|-------|--------------|--|-------|-------------|
| <b>HP SCANJET 3p NEW</b>        | PC/AT | <b>£350*</b> | <b>HP SCANJET Ilex</b>                 | PC/AT | <b>£689</b> |
| - 256 greyscales                | PS/2  | <b>£351*</b> | - 16.7 million colours, 256 greyscales | PS/2  | <b>£689</b> |
| - 300 dpi, enhanced to 1200 dpi | Mac   | <b>£359</b>  | - 400 dpi, enhanced to 1600 dpi        | Mac   | <b>£689</b> |

\*Calera WordScan included in all PC versions

|  |                |                        |
|--|----------------|------------------------|
| <b>HP SCANNER OPTIONS Ilex</b>         | <b>3p</b>      | <b>HEWLETT PACKARD</b> |
| SupportPack (3 yrs OSM)                | £135           | £85                    |
| Auto Document Feeder:                  | £349 (50 shts) | £149 (20 shts)         |
| Transparency Adapter (Ilex ONLY)       | £449           | -                      |
| PC/AT or PS/2 interface kit (inc. s/w) | £309           | £309                   |



### Epson A4, 24 bit colour Flatbed Scanners with two year on-site swapout

All bundles except scanner only option come complete with software, interface (PC), cables and drivers.

**GTX Bundle:** Omnipage Direct, Photoshop LE, PK Portfolio\*  
**GTI Bundle:** Photoshop V3.00 (full version),  
Output resolution: 6500 = 600dpi, 8000 = 800dpi, 9000 = 2400dpi  
Please specify clearly model and bundle when ordering. \* - not included in Mac kit

| Model        | 6500P    | 6500S | 8000P    | 8000S | 9000S |
|--------------|----------|-------|----------|-------|-------|
| Bundle       | Parallel | SCSI  | Parallel | SCSI  | SCSI  |
| Scanner only | £385     | £415  | £515     | £765  | £765  |
| GTX-PC       | £445     | £509  | £556     | £625  | £885  |
| GTI-PC       | -        | £655  | -        | £769  | £1045 |
| GTX-MAC      | -        | £465  | -        | £585  | £889  |
| GTI-MAC      | -        | £615  | -        | £739  | £1049 |

Auto Document Feeder £349(a) Transparency Unit (up to 5"x5") £439(a)

Omnipage PRO £385(a) Direct Win £78 Textbridge V3 PRO WIN £275(a) STD WIN £79

## HAND and A4 SCANNERS

### GENIUS SCANMATE SERIES

#### Scanmate Colour £155(a)

- True Colour - 24 bit, 16.7m colours
- High resolution - 800dpi output resolution
- Twain Compliant - an industry standard
- DTP software - Photofinish 3.0
- OCR software - SmartPage
- Kit comes ready to go

#### Scanmate 256 £65(a)

- True 256 Greyscales
- High resolution - 800dpi output resolution
- Twain Compliant - Kit is ready to go
- DTP & OCR software included

### TRUST A4 Flatbed Scanners CALL FOR FULL SPEC

Imagery 1200 @ £309(a)  
Imagery 2400 @ £399(a)

### LOGITECH

|  |         |
|--|---------|
| Scanman 32 PC DOS NEW                      | £57(a)  |
| Scanman 32 PC Windows NEW                  | £57(a)  |
| Scanman 256 PC Windows                     | £78(a)  |
| Scanman Colour 24 bit Windows NEW          | £167(a) |
| Scanman Easy Touch (Parallel Port Scanner) | £105(a) |
| Scanman Power Page (A4 Feed Scanner)       | £299(a) |
| Dexxa Colour Media Scanner                 | £125(a) |
| Dexxa Colour Office Scanner                | £199(a) |

### Xircom PCMCIA ETHERNET + MODEM II

Modem: V32TERBO (19,200) downwards  
Fax: V17 (14,400) downwards  
Ethernet: BNC, TP or Combo  
CEM2-10BT - TP £389(a) CEM2-10B2 - BNC £399(a)  
CEM2-10BC - BNC + TP £425(a)

BABT APPROVED

## PRINTER ACCESSORIES

|  |                                  |                            |
|--|----------------------------------|----------------------------|
| <b>SWITCHES(b)</b> See opp page for cables                     | <b>HEWLETT-PACKARD</b>           | <b>A5 Paper Feeders</b>    |
| <b>AUTODATA SWITCHES</b>                                       | For Networking see Network page  | DJ500 Series (100 shts)    |
| 2: 2 PCs to 1 PRN  | Adobe Postscript Level 2 Req Mem | LJ 4P/MMP (200 shts)       |
| 4: 4 PCs to 1 PRN  | LaserJet 4P £190 IIISI/4SI       | LJ IIISI/MX/4SI/MX         |
| 8: 8 PCs to 1 PRN  | LaserJet 4 (C2080A) 4+ (C3129A)  | Deskjet 500 Series         |
| <b>MANUAL DATA SWITCHES</b>                                    | DJ1200 + 2Mb                     | HP FX80 Emul Cartridge     |
| Reversible & Inexpensive                                       | PJ XL300                         | JetRAM 256K RAM Cart       |
| 2 In > 1 out   |                                  | DJ310/20 C/Sht Feeder      |
| 3 In > 1 out   |                                  | DJ310/20 Battery           |
| 4 In > 1 out   |                                  | DJ310/20 Charger           |
| 2 way cross over   |                                  | <b>EPSON EPL500/S200</b>   |
| <b>AUTO CROSSOVER SWITCHES</b>                                 | Powered Env Feeder               | PostScript                 |
| 4PCs > 2PRN Parallel   | Lower Cassette Tray              | Local Talk Kit             |
| Once a data path has been set it can be switched by soft code. | For LJ IIISI/4SI/MX              | <b>CANON SHEET FEEDERS</b> |
| <b>Bi-Directional Coverters</b>                                | Duplex Unit                      | Bj10                       |
| Par>Ser/Ser>Par  | Powered Env Feeder               | Bj300 1st                  |
| <b>PARALLEL BUFFERS</b>  | Hi Cap Sheet Feeder              | Bj330 1st                  |
| 256K £139  |                                  | 2nd                        |
| 1Mb £199   |                                  | 2nd                        |

## COMMUNICATION MANAGEMENT

### AUTO PHONE/FAX/MODEM SWITCHES

T = No of handsets supported

F = Fax, M = Modem, A = Answerphone

MSL 1100 T1 & A & F £89(a)

MSL 3300 T4 & A & F £105(a)

MSL 3300M T4 & A & (F or M) £125(a)

MSL 7700 T8 & A & F & M £145(a)

CALL FOR MORE DETAILS

### ANDEST VPA

FREE Pocket High Speed Serial Card

- Answerphone
- Full fax capability • Electronic mail
- Auto message forwarding
- Full remote control • Full modem capability
- Expandable to 8Mb
- Ready to run, easy installation

VPA V22bis £349(a) VPA V32bis £449(a)

## MODEMS (Carr a)

Please indicate internal or external when ordering

|   | V22bis | V32 | V32bis | V32terbo | V34MFC | Upg to V34 | V42 | V42bis | FAX | Internal | External |
|---|--------|-----|--------|----------|--------|------------|-----|--------|-----|----------|----------|
| <b>IBM - For ThinkPad 750 &amp; other PCMCIA Notebooks (OEM).</b> |        |     |        |          |        |            |     |        |     |          |          |
| IBMPCMCIA Fax/Modem Quad Speed                                    | ✓      | ✓   | ✓      | ✓        | ✓      | ✓          | ✓   | ✓      | ✓   | ✓        | 129      |
| IBMPCMCIA Fax/Modem High Speed                                    | ✓      | ✓   | ✓      | ✓        | ✓      | ✓          | ✓   | ✓      | ✓   | ✓        | 199      |

### Robotics

5 yr. Manuf. warr. Free Hot Line Support.  
Sportster & Worldport have fax & comms software.

|  |   |   |   |   |   |   |   |   |   |   |     |
|--|---|---|---|---|---|---|---|---|---|---|-----|
| Sportster 28.8 +Fax  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 189 |
| Sportster 14.4 +Fax  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 127 |
| Sportster 14.4 +Fax for MAC                                | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 139 |
| Courier V34 Modem only                                     | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 265 |
| Worldport DS Cell Pckt                                     | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 167 |
| WP PCMCIA DS Cell + Fax                                    | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 193 |
| USR High Speed Dual Serial Port - 16550 AF 2 yr warr. (9F) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 49* |



2 yr. Manuf. warr. Free Hot Line Support.  
WinFax Lite s/w & Compuserve

|                            |   |   |   |   |   |   |   |   |   |   |     |
|----------------------------|---|---|---|---|---|---|---|---|---|---|-----|
| Goldcard v34+Fax PCMCIA    | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 269 |
| Goldcard v32bis+Fax PCMCIA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 195 |



### LOW LOW PRICES

|                  |   |   |   |   |   |   |   |   |   |   |      |
|------------------|---|---|---|---|---|---|---|---|---|---|------|
| Gem + FAX        | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 59*  |
| SuperGem + FAX   | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 99*  |
| Comms Office NEW | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 129* |



### NEW LOW PRICES

|                          |   |   |   |   |   |   |   |   |   |   |     |
|--------------------------|---|---|---|---|---|---|---|---|---|---|-----|
| Accura 14.4 + Fax        | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 138 |
| Accura 28.8 + Fax v34    | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 173 |
| Optima 14.4 + Fax        | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 249 |
| Optima 28.8 + Fax v34    | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 339 |
| Optima PCMCIA 14.4 + Fax | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 199 |

LIMITED STOCKS - NOW V34, 5YR WARRANTY

Bundle Offer 2 x Optima 288 + 2 x ESP II card

|           |   |   |   |   |   |   |   |   |   |   |     |
|-----------|---|---|---|---|---|---|---|---|---|---|-----|
| Ultra 96  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 429 |
| Ultra 144 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 489 |

Hayes ESP card - High speed Serial port card with processor:

PC/AT ESP II card 1 port £75 2 port £109 MCA ESP card £199



2 yr. manuf. warr. Free Hot Line Support  
Free MultiExpress fax software

|                     |   |   |   |   |   |   |   |   |   |   |     |
|---------------------|---|---|---|---|---|---|---|---|---|---|-----|
| ZDX 2834 Desktop    | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 175 |
| ZDX 1932 Desktop    | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 112 |
| MT 2834 BLK Desktop | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 395 |

FREE High Speed Serial Card While Stocks Last

|                    |   |   |   |   |   |   |   |   |   |   |     |
|--------------------|---|---|---|---|---|---|---|---|---|---|-----|
| MT 1432BLK Desktop | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 309 |
| MT 1432 MK Pocket  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 345 |
| MT 1432LTI PCMCIA  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 199 |



### MOBIFAX 32+ POCKET £95\*

|                         |   |   |   |   |   |   |   |   |   |   |      |
|-------------------------|---|---|---|---|---|---|---|---|---|---|------|
| MobiFax 32+             | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 95*  |
| Microlin FX             | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 79   |
| Microlin FX32+          | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 139  |
| Microlin FX34           | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 197  |
| MLin PCMCIA 32+ NB      | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 197  |
| Linnet 32 Plus FX       | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 149* |
| Linnet Message Desk VFX | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 239  |
| Linnet 34 FX            | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 269  |
| Ultralink 32 Plus       | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 359  |

### MODEM ACCESSORIES

PC Modem Cables 2M 9F to 25M (COM1 card below) £8

PC Modem Cables 2M 25F to 25M (COM2 card below) £9

NEW Multi I/O High Speed Card £29

2 X 16550 SER, 1 x EPP, 1 x Game

Upgrade Win/Fax Lite to Winfax Pro £33(b)

Compuserve Information Manager Windows Software £19(b)

\*Special offer while stocks last

SEE SOFTWARE PAGES FOR COMMUNICATION S/W





# TECHNOMATIC

Techno House, 468 Church Lane, London NW9 8UF

PRICES EXCLUDE VAT @ 17.5%

## Hours of Business:

Mon-Fri: 9.15am to 5.45pm  
Sat: 10am to 5.00pm  
Callers welcome, please check availability.

## STANDARD MEMORIES(b)

### SIMMS

#### 30 PIN SIMMS

|                     |      |
|---------------------|------|
| 1Mb x 9-60/70/80NS  |      |
| (9 chip)            | £34  |
| 1Mb x 9-70 (3 chip) | £31  |
| 4Mb x 9-70/80NS     | £115 |
| 4Mb x 9-60NS        | £119 |
| 256K x 9-80NS       | £13  |

#### 72 PIN SIMMS

|                   |      |
|-------------------|------|
| 1Mb 36 bit 70 NS  | £42  |
| 4Mb 36 bit 70 NS  | £125 |
| 8Mb 36 bit 70 NS  | £259 |
| 16Mb 36 bit 70 NS | £419 |
| 4Mb 32 bit 70 NS  | £119 |
| 8Mb 32 bit 70 NS  | £249 |
| 16Mb 32 bit 70 NS | £389 |

### DRAMS

|                       |       |
|-----------------------|-------|
| 44256-70NS (256K x 4) | £4.50 |
| 1Mb x 1-80/70NS       | £4.90 |
| 1Mb x 4-80/70NS       | £20   |

### CACHE RAM

#### (SRAMS)

|                    |       |
|--------------------|-------|
| 8K x 8 20NS cache  | £4.50 |
| 32K x 8 20NS cache | £7.50 |
| 32K x 8 15NS cache | £8.00 |

Recommended for most Elonex, Ambra, ICL, Olivetti, Opus, Tandon, Vale, Viglen, Gateway and most other clones. Please refer to your manual or manufacturer.



### CO-PROCESSORS (b)

Performance accelerator for CAD, spreadsheets, graphics & DTP

|                      |     |
|----------------------|-----|
| 80287-8 to 20MHz     | £59 |
| 80387SX-16/20/25MHz  | £58 |
| 80387SL-16/20/25MHz  | £58 |
| 80387SX-33MHz        | £65 |
| 80387-DX-16 to 33MHz | £58 |

### IIT FASTER CO-PROCESSORS (b)

|                 |     |
|-----------------|-----|
| 2C87-1.2, 20    | £46 |
| 3C87-20, 25, 33 | £55 |
| 3C87SX-20, 25   | £55 |
| 3C87SX-33       | £55 |
| 3C87-40         | £55 |

### intel OVERDRIVE PROCESSORS (b)

Improve performance up to 70%

|                   |      |
|-------------------|------|
| 486SX16 to DX2-32 | £99  |
| 486SX20 to DX2-40 | £99  |
| 486DX20 to DX2-40 | £99  |
| 486DX25 to DX2-50 | £99  |
| 486SX25 to DX2-50 | £99  |
| 486DX33 to DX2-66 | £129 |

## PRINTER MEMORY UPGRADES(b)

### BROTHER

|                  |     |      |      |
|------------------|-----|------|------|
| HL4VPSAVE        | £79 | £125 | £185 |
| HL-8V/D/BE       | £79 | £115 | -    |
| HL-10-H          | £49 | £89  | £145 |
| HL-10V/DV/PS/DPS | -   | £102 | £179 |

### STAR

|                |     |      |      |
|----------------|-----|------|------|
| LP4/Starscript | £79 | £119 | £175 |
| LP8Plus        | £79 | £119 | £199 |
| LS-5/5EX/5TT   | £76 | £131 | £228 |

### CANON

|                          |     |      |      |
|--------------------------|-----|------|------|
| LBP-4/4+4 Lite           | £89 | £125 | -    |
| LBP-8 II Series          | £65 | £95  | £159 |
| LBP-8 III                | £99 | £129 | £169 |
| LBP-8IV, LBP-4II, LBP-4I | £49 | -    | £129 |

ALSO SEE PRINTER PAGE

### KYOCERA

|                    |     |      |      |
|--------------------|-----|------|------|
| F-800/A/T          | £75 | £109 | £179 |
| F1200S/3000/A/3300 | £79 | £115 | £199 |
| FS1500/820/5000    | £65 | £138 | £260 |
| F1500/A (Ecosys)   | £79 | £144 | £274 |

### SHARP

|                   |       |      |   |
|-------------------|-------|------|---|
| JX-9500 PS        | £59   | -    | - |
| JX-9500/E/H/9700  | 1.5Mb | £119 | - |
| 9400/9600/PS/9460 | -     | -    | - |

### OKI

|               |     |      |      |
|---------------|-----|------|------|
| 9660/9700E    | £65 | £99  | £179 |
| OL830/840/850 | -   | £129 | -    |
| OL800/820     | £69 | £109 | £179 |
| OL400E/EX     | £69 | £109 | £179 |
| OL410E/EX     | £69 | £109 | £179 |

## RAM CARDS(b)

### 0-16Mb Half Length 16-bit Card

|                         |      |
|-------------------------|------|
| 0Mb card                | £99  |
| Card with 2Mb installed | £160 |
| Card with 4Mb installed | £220 |

(Suitable for most 286/386 AT/XT computer please check your manual or manufacturer)

## PCMCIA(b)

### Type I Version 1.0 SRAM

|                        |           |
|------------------------|-----------|
| 1Mb/2Mb                | £125/£195 |
| HP FLASH DISC CARD 12V |           |
| 5Mb F1012A             | £299      |
| 10Mb F1013A            | £475      |
| 20Mb F1014A            | £779      |

All memories supplied are compatible parts from reputable manufacturers. IBM, Compaq & HP original memories are also available. Please call for latest prices.

Memories for AST, Olivetti, Canon and NEC are available, please call if the upgrade you require is not listed.

## MEMORY UPGRADES FOR PCs(b)

### COMPUTER

#### IBM

| THINKPAD | 700-720-750-755-360 (IBM original)                                 | £245 | £485 |
|----------|--|------|------|
| THINKPAD | 700, C-720, C-750, C-755, C-360-330 EQUIV                          |      |      |
| THINKPAD | 350, C-PS/2 L405X PS/NOTE  | £89  |      |
| PS/VP    | 6381   | £135 |      |
| PS/VP    | 6382   | £135 |      |
| PS/VP    | 6384 F/M/W SERIES  | £135 |      |
| PS/VP    | C00-C2A-C20-C4A-C40  | £85  |      |
| PS/I     | 2135-G11-G13-W11-W13-S11-S13, 2155-G14-W14-S14                     | £85  |      |
| PS/I     | PRO 386SX 2123   | £85  |      |
| PS/I     | 386SX 2121   | £89  |      |
| PS/I     | 286 2011   | £89  |      |
| PORTABLE | PS/2 P75   | £85  |      |
| PS/2     | L405X, PS/NOTE 182   | £89  |      |
| PS/2     | N51 SLC/SX   | £89  |      |
| PS/2     | N33 SX   | £89  |      |
| PS/2     | 56-57-76-77 SERIES, PS/2 90-95 SERIES                              | £85  |      |
| PS/2     | SERVER 85, PS/2 E SERIES   |      |      |
| PS/2     | 95XP, 486 OMF, OHT (ECC)   | £209 |      |
| PS/2     | EXP-BOARD FOR PS/2 70 & 80 SERIES                                  | £189 |      |
| PS/2     | 65SX, 50 021, 60 041-071, 55LS-SX041, 081, 55SX 061-031 EXP. BOARD | £85  |      |
| PS/2     | 50 021, PS/2 60 041-071 EXP. BOARD                                 | £249 |      |
| PS/2     | 50Z 031-061  | £85  |      |
| PS/2     | 57SX, M57SLC, 56SLC/L5, 56SX, L5                                   | £85  |      |
| PS/2     | 35LS/SX, PS/2 40SX   | £85  |      |
| PS/2     | 30/286 E21-E31-341, 25-286 006, 036-G06-G36                        | £80  |      |

#### DELL

| NOTEBOOK                  | 325N/NC                   | £99  |  |
|---------------------------|---------------------------|------|--|
| NOTEBOOK                  | NL25, NL20                | £110 |  |
| LAPTOP                    | 320N/N+, 212N             | £135 |  |
| SYSTEM                    | 316SX, 325SX              | £80  |  |
| SYSTEM                    | 320SX, 325P, 325D, 333D/P |      |  |
| SYSTEM                    | 320SLI, 325SLI            | £115 |  |
| SYSTEM                    | 433-333-325P-333-325D     | £135 |  |
| POWER D/TOP               | 486P-66-50-33-25-20-16    | £135 |  |
| POWER D/TOP               | 486D-66-50-33-25-20D      | £135 |  |
| PERFORMANCE ME SERIES     |                           | £135 |  |
| PERFORMANCE T-L-M- SERIES |                           | £129 |  |
| POWERLINE                 | 466-450-433-425-          | £95  |  |
| POWERLINE                 | DE, SE SERIES             | £95  |  |
| DESKTOP                   | 200-210-300 SERIES        | £76  |  |

#### SHARP

|   |      |      |
|---|------|------|
| PC-6881, 6781, 6891, 6785, 6700, 6741, 6800, 6841 | £85  | £169 |
| PC-7700, 7750                                     |      | £209 |
| PC-8501   | £129 |      |
| PC-3000/3100                                      | £195 |      |

### COMPUTER

#### COMPAQ

| CONTURA   | 320, 3125, 325C                 | £75  |  |
|-----------|---------------------------------|------|--|
| CONTURA   | 4/25, CX, EX (COMPAQ ORIGINAL)  | £155 |  |
| LTE       | 386 520                         | £189 |  |
| LTE       | LITE 4/25, 4/25C, 4/25E, 4/33C  | £179 |  |
| LTE 386   | LITE/20, 25, 25C, 25E           | £89  |  |
| SLT       | 386S/20                         | £110 |  |
| PROLINEA  | 3/25S, 325ZS                    | £80  |  |
| PROLINEA  | 4/25S, 4/33, 4/50, 4/66, CDS    | £79  |  |
| PROLINEA  | MT SERIES, NET 1/25             | £79  |  |
| PROLINEA  | Enhanced Family                 | £79  |  |
| PROSIGNIA | PC SERIES SP/LT/M & I SERIES    | £85  |  |
| PROSIGNIA | PC SERVER 486/33-DX2/66         | £135 |  |
| PRESARIO  | CDS 633-CDS 860-660             | £135 |  |
| DESKPRO   | 386-33L, 486-25-33L-50L         | £119 |  |
| DESKPRO   | M & SP/LT SERIES (NOT LT486-33) | £185 |  |
| DESKPRO   | XE 433S, 450, 466               | £79  |  |
| PROLIANT  | 1000 486DX2/66                  | £135 |  |
| SYSTEMPRO | 486/E SERIES                    | £119 |  |

### TOSHIBA NOTEBOOKS

|  |      |      |
|--|------|------|
| T2000/SX/SXE, T2200SX, T1800, T1850, T1850C, T1000LE | £89  | £159 |
| T3100E   | £89  | £159 |
| T3100SX  | £95  | £159 |
| T3200SX  | £85  | £159 |
| T3200SXC   | £85  | £159 |
| T3300SL  | £85  | £159 |
| T2400, T3400, T3600                                  | £169 | £299 |
| T4400C/SX/SXC, T6400 T6600 SERIES                    | £85  | £159 |
| T4500, T4600, T1900/C, 1950/C T4700 SERIES           | £169 | £329 |
| T5100  | £99  |      |
| T5200-T5200C-T8500                                   | £89  | £365 |

### HEWLETT-PACKARD

|           |                                   |      |  |
|-----------|-----------------------------------|------|--|
| VECTRA    | 486-33ST-66ST-25U PC-             | £85  |  |
| VECTRA    | 486 33U PC-50U PC-66U PC          | £85  |  |
| VECTRA    | 486S-20 PC-25T-33T-486VL          | £85  |  |
| VECTRA    | VL2                               | £129 |  |
| VECTRA    | 486-25N-33N-50N-66N               | £85  |  |
| VECTRA    | 386-25N PC-16N PC-20N PC          | £80  |  |
| VECTRA    | 386-25 PC                         | £95  |  |
| VECTRA    | Multimedia PC's                   |      |  |
| VECTRA    | VL 4/33SE - 4/50SE                |      |  |
| VECTRA    | VL 4/66 - 4/100 - M2 4/50-M2 4/66 | £129 |  |
| VECTRA    | 486N2-N21                         | £129 |  |
| VECTRA    | 486M2-M21-XM2 XP/60 - XU          | £129 |  |
| NETSERVER | LE, LM, LF                        | £135 |  |
| HP95LX    |                                   | £199 |  |

### PANASONIC

|                              |      |      |
|------------------------------|------|------|
| CF170, CF270, CF370 NOTEBOOK | £90  | £180 |
| CF380, CF480, CF580 NOTEBOOK | £109 | £189 |
| CF480C                       | £109 |      |

PLEASE CHECK YOUR SYSTEM COMPATIBILITY FOR OVERDRIVES

## intel Overdrive DX4(b) "Speed Tripling"

|  |         |
|--|---------|
| 25 MHZ with overdrive socket to 75 MHZ | £165(b) |
| 25 MHZ replacement CPU to 75MHZ        | £165(b) |
| 33 MHZ with overdrive socket to 100MHZ | £219(b) |
| 33 MHZ replacement CPU to 100MHZ       | £219(b) |

16MB & 32MB MEMORIES ARE AVAILABLE

MEMORY PRICES ARE FLUCTUATING PLEASE CALL FOR LATEST PRICES





# 1<sup>st</sup> WITH CUSTOMERS WITH PRODUCTS WITH MANUFACTURERS



0181-205 9558  
0181-205 0190

PRICES EXCLUDE VAT @ 17.5%



Networking

## NETWORKING

| NOVELL NETWORK         | 5 User | 10   | 25   | 50   | 100  | 250  |
|------------------------|--------|------|------|------|------|------|
| Network 4.1 CD ROM (a) | 450    | 1025 | 1515 | 2045 | 2865 | 5950 |
| Network 3.12 (a)       | 426    | 975  | 1495 | 1945 | 2725 | 4575 |

Call for quote on Novell Connectivity products

## COMMUNICATION SERVER(a)

### US Robotics Fax Servers

- Direct Lan Connection (BNC/TP)
- Novell Network support
- Dos & Windows s/w sit licence - Call for full details

Fax server 1 port £929 2 port £1149

### US Robotics Comms Servers

£999

- Direct Lan Connection (BNC/TP)
- Novell Network support
- Host & Remote functionality - Call for full specifications

### Software Comms Servers

Winport (Comms + Fax) 1 modem £225  
Novell Connect 2 Port £279

## PEER TO PEER NETWORKS

All Techno starter kits contain 5M BNC cable & terminators.  
All Techno add-on kits contain 3M BNC cable. All starter kits contain everything necessary to connect stated no. of PCs.

| Item Description            | Windows for Workgroups |     |
|-----------------------------|------------------------|-----|
|                             | Full Product           | MLP |
| Windows for WG 3.11         | £89                    | £87 |
| Add-on for Win 3.1/W4WG 3.1 | £42                    | £39 |
| Add-on for MS-DOS           | £42                    | £40 |

### Techno W4WG Add-on Kits

For those users with MS Windows 3.1 installed

Techno W4WG 2 Stn Starter Kit £149(a)

Techno W4WG 1 Stn Add-on Kit £69(a)

### Techno Hardware only Kits

For those users with MS W4WG 3.11 installed

Techno 5 Stn Starter Kit H/W only £175(a)

Techno 2 Stn Starter Kit H/W only £66(a)

Techno 1 Stn Add-on Kit H/W only £35(a)

## NOVELL Personal Netware

- Share files, directories, printers & CD-ROMs in Dos & Windows
- Universal network client
- Single Login to all resources

Personal Netware (PNW) £44(b)

Personal Netware 5 Pack £195(a)

Novell Dos 7 inc PNW £49(b)

### Techno Personal Netware Kits

Techno PNW 5 Stn Starter Kits £215(a)

Techno PNW 2 Stn Starter Kits £105(a)

Techno PNW 1 Stn Add-on Kit £59(a)

## LANTASTIC v6.0

A 2 node starter kit includes everything needed to connect two machines including Noderunner network cards. The 1 node starter kits include a card and software for one machine. Upgrades to v6 from any previous version must be purchased per node.

|  |       |
|--|-------|
| Lantastic NodeRunner 2000Si 2 node kit | £195  |
| Lantastic NodeRunner 2000Si 1 node kit | £110  |
| Lantastic A1 software Win + Dos only   | £65   |
| Lantastic A1 software 5 pack           | £315  |
| Lantastic NodeRunner 2000Si card only  | £85   |
| Lantastic NodeRunner 2000Si 5 pack     | £365  |
| Lantastic v6 A1 upgrade 1 user         | £29   |
| Lantastic v6 A1 upgrade 5 user         | £95   |
| Lantastic v6 A1 upgrade 10 user        | £165  |
| Lantastic Central Station II           | £Call |
| Lantastic for OS/2 1 user              | £89   |
| Lantastic for OS/2 5-user              | £370  |
| Lantastic Utility Pack                 | £249  |

## SPECIAL OFFER

Buy a starter kit Get 1 licence free

## PRINTER SERVER(a)

Please verify exact version of protocol supported with manufacturer

| CONNECTION                          | PROTOCOL |        |       |              |         |      | PRICE |
|-------------------------------------|----------|--------|-------|--------------|---------|------|-------|
|                                     | PARALLEL | SERIAL | HI/HP | NOVELL (IPX) | NETBIOS | WING |       |
| Intel Netport Express XL BNC/TP     |          |        |       |              |         |      | £325  |
| Intel Netport Express XL Token Ring |          |        |       |              |         |      | £449  |
| 2                                   | 1        |        |       | P            | P       |      |       |
| Intel Netport Express EL BNC/TP     |          |        |       |              |         |      | £259  |
| Intel Netport Express EL Token Ring |          |        |       |              |         |      | £389  |
| 2                                   |          |        |       |              |         |      |       |
| HP JetDirect Ex                     |          |        |       |              |         |      | £249  |
| HP JetDirect J2552A MIO LJ4 Series  |          |        |       |              |         |      | £289  |
| EMULEX NetQue BNC/TP                |          |        |       |              |         |      | £399  |
| EMULEX NetJet MIO LJ4 Series        |          |        |       |              |         |      | £369  |

## Xircom PCMCIA ETHERNET + MODEM II

Modem: V32TER, V32bis, V22bis + more } IN ONE  
Fax: V17, V29, V27TER } TYPE II  
Ethernet: BNC, TP, Combo } CARD  
Supports all popular PCMCIA 2.0 & 2.1 PCs  
Supports all popular networks inc Novell  
CEM-10BT - TP £389 CEM-10B2 - BNC £399  
CEM-10BC - BNC + TP £425  
BABT APPROVED

## UPS

TRIIPP-LITE UPS - Made in USA, 2yr swap-out.

| Smart Series NEW |         | BC Series              |         |
|------------------|---------|------------------------|---------|
| SM 250 VA        | £185(a) | BC250 VA               | £89(a)  |
| SM 400 VA        | £215(a) | BC400 VA               | £129(a) |
| SM 600 VA        | £229(a) | BC600 VA               | £179(a) |
| SM 750 VA        | £289(a) | BC900 VA               | £289(a) |
| SM 900 VA        | £399(a) | Special Ltd Offer OMNI |         |
| SM 1250 VA       | £499(+) | 600VA £189 900VA £299  |         |

PowerAlert For: Netware £55 Unix £89 Dos/Win £55

## American Power Conversion (APC) 2yr swap-out.

| Smart-UPS (Line-interactive) |         | Back-UPS (off-line) |         |
|------------------------------|---------|---------------------|---------|
| SU250                        | £185(a) | BK250               | £89(a)  |
| SU400                        | £239(a) | BK400               | £135(a) |
| SU600                        | £219(a) | BK600               | £175(a) |
| SU900                        | £439(a) | BK900               | £319(+) |
| SU1250                       | £525(+) | BK1250              | £395(+) |

Powerchute for Netware £55 For Unix £95 For Win £59

For VMS (Tape) £195 For Win NT £95 For HP/UX £119

+ = Call for catalogue, volume discounts available

## HUBS & REPEATERS

| Model carr (a)       | TP | Ports<br>BNC | AUI | SMNP<br>Option | Stackable | Price       |
|----------------------|----|--------------|-----|----------------|-----------|-------------|
| <b>3COM</b>          |    |              |     |                |           |             |
| LBuild FMS II        | 12 | OPT          | 1   | Yes            | Yes       | <b>£449</b> |
| LBuild FMS II        | 24 | OPT          | 1   | Yes            | Yes       | <b>£749</b> |
| <b>SMC</b>           |    |              |     |                |           |             |
| Tiger TP6            | 6  | OPT          | 1   | No             | No        | <b>£159</b> |
| Tiger TP6B           | 6  | 1            | -   | No             | No        | <b>£179</b> |
| Tiger TP12           | 12 | -            | 1   | No             | No        | <b>£319</b> |
| Tiger CX3            | -  | 3            | 1   | No             | No        | <b>£219</b> |
| Elite 3812TP         | 12 | OPT          | 2   | Yes            | Yes       | <b>£399</b> |
| Elite 3608TP         | 8  | -            | 1   | No             | No        | <b>£195</b> |
| <b>Genius 1000/D</b> | 12 | 1            | 2   | Yes            | No        | <b>£199</b> |
| <b>Techno</b>        |    |              |     |                |           |             |
| 8TP Port             | 8  | -            | 1   | No             | No        | <b>£129</b> |
| 4 Port Repeater      | -  | 4            | 2   | No             | No        | <b>£339</b> |
| 2 Port Repeater      | -  | 2            | 2   | No             | No        | <b>£185</b> |

## NOVELL

## CALL FOR UPGRADES & EDUCATIONAL PRICES

NETWORK OR LAN MANAGER SERVER SUPPORT FOR 1 YEAR  
Full telephone and dial-up on-line support by CNE team. Price of support contract includes modem. £1500

Novell  
Authorised  
Reseller

## NETWORK BACKUP SEE STORAGE PAGE

## ETHERNET PRODUCTS(a)

### GENIUS COMBO CARD

GE2000D Lifetime warranty, BNC & TP, NE2000 compatible, s/w & h/w configure, T Piece. See Taxan/Genius page for more info.

£32(b)  
20 pack £589(a)



B = BNC, A = AUI, T = TP, I = ISA, M = MCA, E = EISA, V = VLB, P = PCI

### NETWORK BUS

|              |       |      | 1PK  | 5PK  | 20PK  |
|--------------|-------|------|------|------|-------|
| 3COM         |       |      |      |      |       |
| 3C509B       | B A - | I-16 | £67  | £319 | £1199 |
| 3C509BTP     | - - T | I-16 | £68  | £319 | £1149 |
| 3C509B-Combo | B A T | I-16 | £76  | £359 | £1299 |
| 3C529B       | B A - | M-32 | £155 | £709 | -     |
| 3C529B-TP    | - A T | M-32 | £156 | £709 | -     |
| 3C579        | B A - | E-32 | £149 | £699 | -     |
| 3C579-TP     | - A T | E-32 | £149 | £699 | -     |
| 3C503-16     | B A - | I-16 | £115 | £535 | -     |

### SMC Ethercard Plus

|                               |       |        | 1PK  | 6PK  | 24PK  |
|-------------------------------|-------|--------|------|------|-------|
| Elite Ultra 16                | B - - | I-8/16 | £59  | £339 | £1200 |
| Elite Ultra 16T               | - - T | I-8/16 | £60  | £329 | £1100 |
| Elite Ultra 16C               | B - T | I-8/16 | £65  | £379 | £1379 |
| Elite/A                       | B A - | M-16   | £129 | -    | -     |
| Elite 10T/A                   | - A T | M-16   | £129 | -    | -     |
| Ultra 32C EISA                | B - T | E-32   | £159 | £849 | -     |
| Etherpower PCI                | B - T | P-32   | £149 | £829 | -     |
| Ultra Boot Rom Multi-Protocol |       |        |      |      | £29   |

### Novell - Genuine Cards

|           |       |      | 1PK  | 5PK   | 20PK |
|-----------|-------|------|------|-------|------|
| NE2000 +  | B - - | I-16 | £49  | £219* | POA  |
| NE2000T + | - - T | I-16 | £40* | £235  | POA  |
| NE2000+3  | B - T | I-16 | £59  | £279  | POA  |

### D-Link Ethernet

|                          |       |        | 1PK  | 6PK  |
|--------------------------|-------|--------|------|------|
| DE220C                   | B - - | I-8/16 | £55  | £309 |
| DE220T                   | - - T | I-8/16 | £55  | £310 |
| DE220CT                  | B - T | I-8/16 | £66  | £389 |
| DE500CAT VLB             | B A T | V-32   | £199 | -    |
| DE320CT MCA              | B - T | M-32   | £115 | -    |
| DE400 EISA               | B - T | E-32   | £149 | -    |
| DE530 PCI                | B - T | P-32   | £99  | -    |
| DEDE220X Novell Boot Rom |       |        | -    | £19  |

### Intel EtherExpress (E.XP)

|                     |       |        | 1PK | 5PK  | 20PK |
|---------------------|-------|--------|-----|------|------|
| E.XP PRO 16C        | B - T | I-8/16 | £57 | £279 | POA  |
| E.XP PRO Flash 16CB | - T   | I-8/16 | £65 | £315 | POA  |

### Ethernet for Portables

|                                    |  | BNC  | TP   | DUAL  |
|------------------------------------|--|------|------|-------|
| Genius E3000D-II with printer      |  | -    | -    | £76   |
| Multiplexer built-in & EPP support |  |      |      |       |
| Xircom Pocket III                  |  | £185 | £186 | £189* |
| SMC Elite Note                     |  | -    | -    | £169  |
| D-Link DE600                       |  | -    | -    | £69*  |
| D-Link DE620 EPP Support           |  | £114 | £115 | £129  |

### PCMCIA

BNC TP DUAL

## PC-ZEN BNC & TP PCMCIA GOLD CARD £149

|                                   |      |      |      |
|-----------------------------------|------|------|------|
| 3COM 3C589B                       | -    | £135 | £149 |
| Xircom PCMCIA - Performance range | £165 | £155 | £189 |
| SMC Elite Card                    | -    | £140 | £159 |
| Genius ME3000II - LOW PRICE       | -    | -    | £109 |
| D-Link DE650                      | £129 | £130 | £149 |

\*While stocks last

Boot ROM for NE2000 & clones TEC/NK/R09R £10(c)

### Cables & Accessories

| Length (m) | 3    | 5   | 10       | 15  | 20      | 25  | 30       | 50  |
|------------|------|-----|----------|-----|---------|-----|----------|-----|
| Thin       | £6   | £8  | £12      | £16 | £20     | -   | £27      | £35 |
| TP         | £9   | £12 | £17      | £22 | -       | £30 | -        | -   |
| 100M Reel  | Thin |     | £45(2xa) |     | 300M TP |     | £169(2a) |     |

BNC T-Piece 5 Pack £15(c) BNC F-F Barrel 5 Pack £15(c)

BNC 50ohm Earthed Terminator 2 Pack £4(c) BNC M-M Barrel 5 Pack £17(c)





# TECHNOMATIC

Techno House, 468 Church Lane, London NW9 8UF

PRICES EXCLUDE VAT @ 17.5%

Hours of Business:

Mon-Fri: 9.15am to 5.45pm

Sat: 10am to 5.00pm

Callers welcome, please check availability.

Monitors

## MONITORS (MULTISYNC COLOUR)

**TAXAN**

### The Art of Vision

(1 year RTB warranty)

CALL FOR ON-SITE

|            |     |           |                  |       |
|------------|-----|-----------|------------------|-------|
| 400LR NEW  | 14" | 800x600   | @ 60Hz* EPA      | £190  |
| 410LR NEW  | 14" | 1024x768  | @ 60Hz EPA       | £199  |
| 420LR NEW  | 14" | 1280x1024 | @ 60Hz           | £240  |
| 580LR      | 15" | 1280x1024 | @ 60Hz EPA       | £285  |
| 880LR NEW  | 17" | 1280x1024 | @ 62Hz EPA       | £530  |
| 885LR NEW  | 17" | 1600x1200 | @ 65Hz EPA       | £629  |
| 895LR NEW  | 17" | 1600x1200 | @ 67Hz Trinitron | £849  |
| 1080LR NEW | 20" | 1600x1200 | @ 65Hz EPA       | £939  |
| 1095LR     | 20" | 1600x1200 | @ 62Hz Trinitron | £1459 |
| 2100LR NEW | 21" | 1600x1200 | @ 72Hz Diatron   | £1532 |



**PHILIPS**

Brilliance 15B



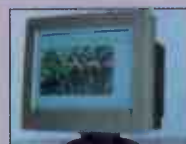
- 15" flat, square tube
- Built-in stereo speakers
- Low radiation & static (MPR-II)
- 0.28mm dot pitch

£264

All Philips monitors are low radiation (MPR-II compliant)

|     |     |           |                  |       |
|-----|-----|-----------|------------------|-------|
| 14C | 14" | 800x600   | @ 56Hz*          | £169  |
| 14A | 14" | 1024x768  | @ 70Hz           | £203  |
| 15B | 15" | 1024x768  | @ 72Hz Stereo    | £264  |
| 17A | 17" | 1280x1024 | @ 76Hz           | £659  |
| 17C | 17" | 1024x768  | @ 72Hz Stereo    | £435  |
| 20T | 20" | 1280x1024 | @ 76Hz Trinitron | £1349 |
| 21B | 21" | 1600x1280 | @ 60Hz           | £1365 |

All resolutions shown are maximum non-interlaced. Models marked with a \* can achieve higher resolutions by interlacing.



## NEC PLUG & PLAY MONITORS

XV - Value Range - Soho Market  
XE - Efficiency Range - Corporate Market  
XP - Professional Range - DTP/CAD Market

|      |     |                   |        |       |
|------|-----|-------------------|--------|-------|
| XV15 | 15" | 1024x768          | @ 80Hz | £289  |
| XV17 | 17" | 1024x768          | @ 80Hz | £580  |
| 2V   | 14" | (Not Plug & Play) |        | £232  |
| XE15 | 15" | 1024x768          | @ 80Hz | £405  |
| XE17 | 17" | 1024x768          | @ 80Hz | £715  |
| XE21 | 21" | 1152x870          | @ 75Hz | £1379 |
| XP17 | 17" | 1280x1024         | @ 76Hz | £945  |
| XP21 | 21" | 1600x1200         | @ 70Hz | £1799 |

## SONY NEW

|             |     |       |          |     |       |
|-------------|-----|-------|----------|-----|-------|
| CPD 15 SFI  | 15" | £295  | TX-T1537 | 15" | £323  |
| CPD 17 SFI  | 17" | £575  | TX-D1751 | 17" | £645  |
| GDM 17 SEIT | 17" | £839  | TX-D1732 | 17" | £499  |
| GDM 20 SEIT | 20" | £1479 | TX-D2032 | 20" | £1135 |
| GDM 20 SEV  | 20" | £1319 | TX-D2131 | 21" | £1369 |

## Panasonic 2 years on-site

12" MONO SVGA MONITOR

14" COLOUR SVGA MONITOR

- 1024 x 768 non-interlace Res.
- Low Radiation
- 0.28mm Dot pitch
- TUV & UL approved

£149(a)

## GRAPHICS CARDS

| MODEL                   | RAM  | ISA      | VLB       | PCI  |
|-------------------------|------|----------|-----------|------|
| <b>TAXAN</b>            |      |          |           |      |
| WIN TURBO+              | V4MB | £398     | £399      | £400 |
| WIN TURBO (Upgradeable) | V2MB | £248     | £249      | £250 |
| WIN BOOST (Upgradeable) | D1MB | £114     | £115      | £116 |
| GTS 795 (MACH 32)       | D1MB | £88      | £89       | £90  |
| ULTRA PRO               | V2MB | MCA £228 | EISA £229 |      |
| <b>DIAMOND</b>          |      |          |           |      |
| VIPER SE                | V4MB | -        | £358      | £359 |
| STEALTH V64-4           | V4MB | -        | £325      | £329 |
| STEALTH V64-2           | V2MB | -        | £231      | £219 |
| STEALTH D64-2           | D2MB | -        | £129      | £131 |
| STEALTH D64-1           | D1MB | -        | £98       | £100 |
| SPEEDSTAR 64            | D1MB | £105     | ISA D2MB  | £169 |

**TECHWORKS** - NEW

|  |      |     |      |      |
|--|------|-----|------|------|
| THUNDERBOLT-2                                      | D2MB | -   | £135 | £116 |
| THUNDERBOLT-1                                      | D1MB | £59 | £96  | £75  |
| VLB - ET4000, PCI - TRIDENT DGI, ISA - CIRRUS 5422 |      |     |      |      |

**MATROX - NEW 3D ABILITY ALSO AVAILABLE WITH 220HZ RAMDAC**

|  |      |      |      |      |
|--|------|------|------|------|
| IMPRESSION PLUS                            | V2MB | £275 | -    | £249 |
| IMPRESSION PLUS LITE                       | V2MB | -    | £219 | £215 |
| MGA 2MB VRAM UPGRADE MODULE FOR PLUS RANGE |      |      |      |      |

**ORCHID**

|               |       |      |      |      |
|---------------|-------|------|------|------|
| KELVIN 64-2   | D2MB  | £134 | £133 | £135 |
| KELVIN 64-1   | D1MB  | £100 | £99  | £109 |
| FAHRENHEIT VA | D1MB  | £95  | -    | -    |
| STANDARD SVGA | 512KB | £29  |      |      |
| STANDARD SVGA | 1MB   | £39  |      |      |

## OVERHEAD PROJECTION PANEL



**Ideal for large presentations**

**Quality product made in Norway**

**Impact 64 (Mono) £999(a)**

**Impact 256 (256K colours) £1999(a)**

**Impact 21 (2.1M colours) £2799(a)**

**Impact 24 (16.7M col, data & video) £3625(a)**

**ProLite 400W Portable projector £599(a)**

Designed to fit impact panels.

**Red Spot Laser Pointer**

Ideal for Presentations

Points up to 50ft GENNKZ031 **£45(c)**

## PC PARTS

### KEYBOARDS

|   |        |
|---|--------|
| Microsoft Natural Keyboard  | £66(a) |
| KeyPro Programmable Keyboard  | £39    |
| <ul style="list-style-type: none"> <li>• 12 programmable function keys</li> <li>• Built in LCD calculator</li> <li>• Diagonal cursor keys</li> <li>• Key-lock function • XT/AT compatible</li> <li>• Angled template holder with 5 templates</li> </ul> |        |
| <b>CHERRY 102 Key AT Keyboard</b>   | £45    |
| German made using high quality key switches   |        |
| <b>Mitsumi XT/AT Keyboard</b>   | £29    |
| Keyboard Extension. Cable XT/AT   | £7(c)  |
| Keyboard Extension. Cable PS/2  | £9(c)  |
| AT Keyboard to PS/2 system Conv. cable  | £9(c)  |
| <b>Ergo Wrist Rest</b>  | £4(c)  |

FREE WRIST REST

### VDU FILTERS

|                                      |       |
|--------------------------------------|-------|
| <b>Glass - TUV &amp; SSI App (b)</b> |       |
| Mirus ECO 14"-15"                    | £39   |
| Mirus CAD 16"-17"                    | £59   |
| <b>Carbon Fibre (c)</b>              |       |
| Colour Monitor                       | £8 £9 |
| Mono Monitor                         | £7 £8 |

### MICE & TRACKER(b)

|   |         |
|---|---------|
| <b>Microsoft(b)</b>   |         |
| MS Mouse V2 Serial & PS/2   | £38     |
| MS Mouse V2 5pk Serial & PS/2   | £185(a) |
| MS Mouse V2 Bus   | £49     |
| MS Home Mouse Serial  | £27     |
| <b>Logitech(b)</b>  |         |
| Pilot II Mouse PC Serial  | £18     |
| Pilot II Mouse PS/2   | £18     |
| Pilot Trackman PC Serial New!   | £27     |
| Mouseman Serial (or PS/2)   | £35     |
| Mouseman Cordless Small   | £49     |
| Trackman II PC Combo  | £42     |
| Trackman Portable Ser + PS/2  | £32     |
| Trackman Voyager  | £48     |
| <b>Hard Mouse Mat</b>   | £4(c)   |
| <b>Genius(b)</b>  |         |
| Hi Mouse range includes mouse mat, 9-25 adaptor and Paintbrush IV   |         |
| Hi Mouse Serial Only  | £19     |
| Hi Mouse Serial & PS/2  | £21     |
| Mouse One Serial  | £9      |
| Hi Point Serial   | £20     |
| Clips on to keyboard, includes carry case and 9-25 adaptor, ideal for notebook user   |         |
| <b>Mini tablet &amp; pen mouse</b>  |         |
| Genius Easy Painter: A budget price digitiser for those who want to exercise their free hand creativity. Includes PC Paintbrush for Windows, 3 button stylus, 25. 9 pin adaptor DOS/Windows/ADI Driver. |         |

£69(b)

Accessories



# UNRIVALLED 24 YEARS OF EXPERIENCE



**0181-205 9558**  
**0181-205 0190**



PRICES EXCLUDE VAT @ 17.5%

## TAPE BACKUP

NEW

### HP JETSTORE DAT BACKUP (a)

Fast & Secure Backup

**Jetstore 2000 Workstation-based kit**  
2Gb drive, Arcserve s/w & SCSI card  
**Jetstore 5000 Network Server-based kit**  
2Gb to 8Gb drive, 250-user Arcserve v4/v5 & SCSI card  
**Jetstore 6000 Network Server-based kit**  
4Gb to 16Gb drive, 250-user Arcserve v5 & SCSI card

| (Drive Only)     | Int  | Ext  | ISA Kit |
|------------------|------|------|---------|
| Jetstore 2000    | £645 | £775 | £889    |
| Jetstore 5000-v4 | £735 | £839 | £1499   |
| Jetstore 5000-v5 | £735 | £839 | £1839   |
| Jetstore 6000-v5 | £885 | £985 | £2039   |

HP Support Pack for Jetstore  
(Provides 3 years OSM direct from HP)  
**TECHNO DAT Drives Kits (a)** 1 yr RTB warranty

| Leading DAT Drives (HP/Sony) | INT   | EXT   |
|------------------------------|-------|-------|
| TEC 2Gb DAT                  | £579  | £699  |
| TEC 2.8Gb DAT                | £669  | £769  |
| TEC 4-16Gb DAT               | £799  | £899  |
| TEC 24-48Gb DAT Autoloader   | £1959 | £2049 |

### COLORADO BACKUP SYSTEMS (a)

NEW LARGER CAPACITIES

**Internal Tape Backup Solutions**  
Run from PC's floppy controller; or use an optional fast controller card for speed and compression

|                                    |      |
|------------------------------------|------|
| Jumbo 250 80/250Mb (QIC-80)        | £92  |
| Jumbo 350 170/340Mb (QIC-80XL)     | £101 |
| Jumbo 700 340/680Mb (QIC-3010)     | £165 |
| KE-10 External Mounting Kit        | £61  |
| FC-20 Fast Controller card (250)   | £50  |
| TC-15 Fast cont. + h/w comp. (250) | £112 |

Full range of accessories & mounting kit - Call

**Parallel Port Backup Solutions**

|                                  |      |
|----------------------------------|------|
| Trakker 250 80/250Mb (QIC-80)    | £189 |
| Trakker 350 170/340Mb (QIC-80XL) | £204 |
| Trakker 700 340/680Mb (QIC-3010) | £271 |
| Trakker Carrying Case            | £39  |

**Colorado Backup Software Win v2** £49  
**SK35 Colorado Backup for OS/2** £79  
**CU53J Unix/Xenix Backup s/w** £79

### EXABYTE HIGH PERFORMANCE TAPE DRIVES

- SCSI-2 Interface • Mini cartridge (DC2000 format)
- 1Gb native, 2Gb compressed
- 567Kb/sec data transfer rate
- Kits complete with PC card, s/w, cable & 1 cartridge

|                                  |         |
|----------------------------------|---------|
| EXABYTE 2501 FSI/Ge Internal Kit | £539(a) |
| EXABYTE 2501 FSI/Ge Internal Kit | £649(a) |
| EXABYTE 2501 Bare drive only     | £399(a) |

## PCMCIA DEVICES (a)

### HARD DISKS - TYPE III NEW LOW PRICES

**Maxtor 105Mb** £235 **170Mb** £299  
**MiniStar with Stacker Anywhere on board**  
**130Mb/260Mb** £269 **170Mb/340Mb** £325

### PCMCIA FOR DESKTOPS

**DOCKET SOCKET** £199  
A standard Type III slot in a 3.5" drive bay. Inc. 5.25" adaptor & 16-bit interface with rear Type II slot.

**MAXTOR DESKRUNNER**  
Provides 1 Type III front slot £95(a)

## TAPE CARTRIDGES

**Colorado Formatted - 3 Pack(c)**

|                   |     |                   |     |
|-------------------|-----|-------------------|-----|
| DT-120 (QIC-40)   | £49 | DT-250 (QIC-80)   | £45 |
| DT-350 (QIC-80XL) | £54 | DT-740 (QIC-3010) | £69 |

**3M QUALITY TAPE CARTRIDGES**

| Unformatted            | 1(c)  | 5pk (b) |
|------------------------|-------|---------|
| DC2120 (QIC-80)        | £9.75 | £45     |
| DC2120XL (QIC-80XL)    | £14   | £66     |
| MC3000XL (QIC-3010)    | £21   | £100    |
| DC6150                 | £12   | £55     |
| DC6250                 | £15   | £70     |
| DC6525                 | £17   | £80     |
| Exabyte DC3000XL (1Gb) | £23   | £105    |

**4mm DDS DAT tapes - 5 tapes per pack**

| 3M(1pk)        | SONY | HP  |
|----------------|------|-----|
| 1.3Gb 60m      | -    | £45 |
| 2Gb 90m        | £9   | £55 |
| 4Gb 120m DDS-2 | -    | £79 |

HP DDS DAT Cleaning Kit - 2 tapes £24

## DISKETTES (c)

**3M 3.5" DISCS (10/PACK)**

| HD   | £6.00     | HD Formatted | £7.00  |
|--|-----------|--------------|--------|
| <b>BULK DISCS 3.5" HD (1.44MB) FORMATTED</b> |           |              |        |
| 50   | £25.00    | 100          | £44.00 |
| 200  | £82.00(b) |              |        |

Floptical Diskettes 21Mb 5pk £70 10pk £130  
Magneto Optical Diskettes

|       |     |      |      |
|-------|-----|------|------|
| 128Mb | £26 | 10pk | £240 |
| 230Mb | £40 | 10pk | £380 |
| 1.5Gb | £95 | 5pk  | £459 |

**CALL FOR HIGH VOLUME DISCOUNTS**

**JVC/Sony 5.25" HD Discs**

|     |        |     |        |
|-----|--------|-----|--------|
| 100 | £20(b) | 200 | £38(b) |
|-----|--------|-----|--------|

## PCI MOTHERBOARDS NEW

**Intel Pentium PCI Boards**

- 3 PCI slots • 4 ISA slots
- On board ATAPI/2 IDE, FD, EPP,
- 2 x high speed serial
- 72 Pin Simm Sockets (70ns)
- Baby AT size • 256Kb cache
- Intel PCI Chip Set

Designed and manufactured by Intel

|                            |         |
|----------------------------|---------|
| Pentium 90 MHZ CPU + Board | £665(a) |
| Pentium 66 MHZ CPU + Board | £555(a) |

**SPECIAL OFFER**  
**PENTIUM 90 + BOARD + 2 X 8MB RAM**  
**£1175(a)**

## CACHING CONTROLLERS(b)

**IDE - OMB fitted**

- Support for Dos, Windows, NT, OS/2 Network, SCO AT&T UNIX
- Hardware disk mirroring (RAD 1)
- Up to 4 drives supported • Fast ATA support
- 4 x 30 pin Simm sockets (16MB max)
- Auto configure & drive select

|         |      |     |      |
|---------|------|-----|------|
| TIC 101 | ISA  | OMB | £59  |
| TIC 20V | VLB  | OMB | £99  |
| TIC 30E | EISA | OMB | £159 |
| TIC 40P | PCI  | OMB | £149 |

**SCSI - OMB fitted**

- Support for Dos, Windows, NT, OS/2 Network, SCO AT&T UNIX
- AHA 154X compatible
- Supported by Corel SCSI (approved)
- Hardware disk mirroring • S/W configuration
- 4 x 30 pin Simm sockets (16MB max)

|         |      |     |      |
|---------|------|-----|------|
| TSC 101 | ISA  | OMB | £149 |
| TSC 20V | VLB  | OMB | £249 |
| TSC 30E | EISA | OMB | £289 |
| TSC 40P | PCI  | OMB | £204 |

## HARD DISKS (a)

**BAD BLOCK - EMERGENCY!!**  
Recover lost data on hard disk or floppy with **SPINRITE 3.1** "the most comprehensive data recovery package available. If you can't get your data back with this, you're in trouble" PC PRO April 95. No PC should be without it.  
**CE80 523 Spinrite 3.1 Data Recovery** £99

For improved IDE performance upgrade to our enhanced-IDE VLB controller (IDE-5)

| MODEL                           | SIZE (Mb) | PRICE |
|---------------------------------|-----------|-------|
| <b>Fast - SCSI-2 Drives (a)</b> |           |       |
| HP 1GB                          | C3323S    | £389  |
| HP 2GB                          | C2490S    | £725  |
| IBM 1GB                         | Pegasus   | £365  |

## CONNER

| IDE                |      |      |
|--------------------|------|------|
| CF-420A            | 420  | £125 |
| CF-540A            | 540  | £145 |
| CF-850A            | 850  | £249 |
| CF-1080A           | 1000 | £409 |
| <b>Fast SCSI-2</b> |      |      |
| CFA540S            | 540  | £235 |
| CFP1060S           | 1060 | £389 |

## SEAGATE

| IDE                |      |       |
|--------------------|------|-------|
| ST9385AG (2.5")    | 341  | £260  |
| ST3491A            | 428  | £125  |
| ST3660A            | 545  | £145  |
| ST5850A            | 850  | £285  |
| ST31220A           | 1050 | £315  |
| <b>FAST SCSI-2</b> |      |       |
| ST5660N            | 528  | £229  |
| ST31230N           | 1050 | £389  |
| ST32430N Hawk      | 2100 | £739  |
| ST32550N B/cud     | 2100 | £829  |
| ST5230N Hawk       | 4000 | £1579 |
| ST5150N B/cud      | 4000 | £1639 |
| ST410800N          | 9090 | £2579 |

## FUJITSU(a)

| IDE                |      |      |
|--------------------|------|------|
| M2681T             | 264  | £105 |
| M2682T             | 352  | £119 |
| M2684T             | 528  | £139 |
| <b>FAST SCSI-2</b> |      |      |
| M2637SA (2.5")     | 240  | £199 |
| M2684SA            | 530  | £169 |
| M2915 NEW          | 2170 | £829 |

## MICROPOLIS(a)

| FAST SCSI-2      |      |       |
|------------------|------|-------|
| 4221S (LP) 3.5"  | 2050 | £765  |
| 3243S (HH) 3.5"  | 4294 | £1429 |
| 1991S (FH) 5.25" | 9100 | £2099 |

**SPECIAL OFFER - Limited Stocks**  
**3GB Fast SCSI-2**  
**FH 5.25" 1936** **£845**

## TEAC REMOVABLE DRIVES (a)

All kits contain removable HDD, docking bay (5.25" HH), configuration disk, carrying case and installation manual. drives work with standard IDE controllers and are bootable.

| Size  | Dual Bay | Single Bay | Extra Drive |
|-------|----------|------------|-------------|
| 250Mb | £315     | £285       | £248        |
| 360Mb | £399     | £363       | £327        |
| 540Mb | £580     | £545       | £499        |

**5.25" ADAPTOR KIT FOR 3.5" HARD DRIVES** £12(c)  
**"Y" POWER SPLITTER (YCB/DS/W101)** £8(c)

**CUSTOMERS ARE RESPONSIBLE FOR ENSURING THAT PRODUCTS WILL BE COMPATIBLE WITH THEIR SYSTEMS BEFORE ORDERING.**

**PLEASE CHECK CURRENT PRICE AND AVAILABILITY BEFORE ORDERING. ALL DRIVES ARE 3.5" FORMAT UNLESS OTHERWISE SHOWN.**

## PARALLEL PORT DRIVES(a)

**BackPack Hard Disk Drives 40Mb** £99  
**420Mb** £329 **850Mb** £445 **1.2Gb** £579

**BackPack Floppy Disk Drives**

|        |      |        |      |       |      |
|--------|------|--------|------|-------|------|
| 1.44Mb | £125 | 2.88Mb | £159 | 1.2Mb | £129 |
|--------|------|--------|------|-------|------|

**BackPack CD-ROM Quad speed** £255

**Tape Drives - Also see Colorado section**

**BackPack 1080 250Mb (QIC-80)** £229

**BackPack 900 Up to 900Mb (QIC 3010)** £369

## FLOPPY DRIVES(b)

**Teac, 1.44Mb 3 1/2" FD + 5 1/4" Kit** £36

**Teac 1.2Mb 5 1/4" Floppy Drive** £42

**Teac 2.88Mb 3 1/2" FD + 5 1/4" Kit** £69

**2 IN 1 : Dual Floppy Drive** £89

3 1/2" + 5 1/4" in half height frame

## SCSI ACCESSORIES

**SCSI DEVICE CASES WITH PSU(a)**  
Includes: 50-way Centronics input & output, PSU, mains cable, fan, activity LED, SCSI ID switch, mounting screws.

|          | Single | Dual | Quad |
|----------|--------|------|------|
| 3.5" HH  | £79    | -    | -    |
| 5.25" HH | £85    | £109 | £139 |

### SCSI CABLES(c)

**INTERNAL (50-way IDC-IDC)** Length

|               |     |                |     |
|---------------|-----|----------------|-----|
| 1 device 28cm | £6  | 2 devices 45cm | £9  |
| 4 devices 1m  | £22 | 6 devices 1.4m | £32 |

**EXTERNAL**

|                               |    |     |
|-------------------------------|----|-----|
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| 50-way Micro-D each end       | 1m | £45 |
| 50-way Centronics to Micro-D  | 1m | £38 |
| 25-way D to 50-way Centronics | 1m | £25 |

**TERMINATORS (50-way Centronics)**

|         |    |        |     |                |     |
|---------|----|--------|-----|----------------|-----|
| Passive | £9 | Active | £29 | Forced Perfect | £69 |
|---------|----|--------|-----|----------------|-----|

## PC PARTS (b)

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- Enhanced IDE mode 3 (ATA-2) for VLB card
- Standard IDE mode for ISA card
- 2 x 16550 UART buffered serial ports
- 2 x 2.88Mb floppy disk support
- Multi-mode parallel port (standard, BODir, ECP, EPP)

|                  |        |                  |        |
|------------------|--------|------------------|--------|
| <b>IDE-4 ISA</b> | £39(b) | <b>IDE-5 VLB</b> | £59(b) |
|------------------|--------|------------------|--------|

|                                 |     |
|---------------------------------|-----|
| IDE-1 AT HD/FD only inc cables  | £12 |
| IDE-2 AT HD/FD/2S/IP inc cables | £16 |
| IDE-3 VLB HD/FD/2S/IP card      | £19 |
| I/O-1 AT 2S/IP/1G               | £14 |
| I/O-2 XT/AT Dual Serial Port    | £14 |

## M-O DRIVES(a)

**Fujitsu 3.5" Optical Drives**

|                                   |         |
|-----------------------------------|---------|
| M2512A 230Mb drive only (int)     | £489(a) |
| M2512A 230Mb Drive only (ext)     | £589(a) |
| M2512A 230Mb PC SCSI Kit (ext)    | £659(a) |
| M2512A 230Mb PC Parallel Port Kit | £749(a) |

**Panasonic 5.25" Optical Drives**

|                            |          |
|----------------------------|----------|
| LF7304 1.5Gb SCSI int drv  | £1485(a) |
| LF7300B 1.5Gb SCSI ext drv | £1545(a) |

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| 1515     | ISA       | £69          |
| 1542C    | ISA       | £129         |
| 1640     | MCA       | £235         |
| 2742T    | EISA      | £199*        |
| 2842     | VLB       | £169         |
| 2940     | PCI       | £199         |

\*Single Channel

### ADAPTEC PARALLEL PORT ADAPTERS

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**DPT FAST SCSI-2** Ideal for Servers

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| <b>DPT Caching Module Upgrade OMB</b>       | £299 |
| <b>DPT Disk Array Module Upgrade</b>        | £299 |

|   |     |
|---|-----|
| I/O-4 XT/AT Dual Parallel Port              | £14 |
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| Dual Floppy Drive Cable                     | £7  |
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| PS/2 to AT Serial Port Adapter              | £5  |





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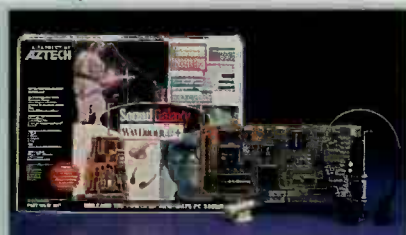
| Model                     | Access | Transfer     | Video CD AT Card | Loading | INT Bare                           | EXT Bare                                      | INT Kit                          | EXT Kit       | All the below are MPC2 and multi-session compatible |
|---------------------------|--------|--------------|------------------|---------|------------------------------------|---|----------------------------------|---------------|---|
| NEC 3xi (NE)              | 195ms  | 450kb (3X)   | £43 (16b)        | Caddy   | £215                               | (+ Encarta 95)                                | £258                             | (+Encarta 95) | SCSI  |
| NEC 3xp+ (NE)             | 250ms  | 450kb (3X)   | £43 (16b)        | Tray    |                                    | £242  |                                  | £288          |   |
| NEC 4xi/e (NE)            | 220ms  | 600kb (4X)   | Yes              | Caddy   | £249                               | £369  | £292                             | £416          |   |
| NEC 4xp (NE)              | 220ms  | 600kb (4X)   | £43 (16b)        | Caddy   |                                    | £499 NEW                                      |                                  | £542 NEW      |   |
| Pioneer DRM604X (PN)      | 300ms  | 600kb (4X)   | Yes              | Caddy   |                                    | £799  |                                  | £939          |   |
| Pioneer DRM602X (PN)      | 300ms  | 300kb (2X)   |                  | Caddy   |                                    | £399  |                                  | £449          |   |
| Sony CDU555               | 220ms  | 360kb (2-4X) | Yes              | Tray    | £125                               | £199  |                                  |               |   |
| Toshiba KT3501 (TS)       | 170ms  | 614kb (4X)   | Yes              | Caddy   | £242                               | £289  | £293                             | £349          |   |
| Toshiba XM5201B (TS)      | 190ms  | 510kb (3.4X) | Yes              | Tray    | £148                               |   | £214                             |               |   |
| Toshiba KT3601B (TS)      | 150ms  | 660kb (4.4X) | Yes              | Tray    | £225 NEW                           |   | £220 NEW                         |               |   |
| Toshiba KT3504S (TS)      | 170ms  | 614kb (4X)   | Yes              | Caddy   |                                    | £1299   |                                  | £1375         | GENERIC   |
| Creative CR563 (PA)       | 320ms  | 300kb (2X)   |                  | Tray    | £94(+Photostylar +Grolier CD-ROMS) |   |                                  |               |   |
| Panasonic CR562 (PA)      | 320ms  | 300kb (2X)   |                  | Tray    | £82                                | (+cables+s/w)                                 | £95                              |               | IDE   |
| Aztech CDA268-031 (AZ)    | 320ms  | 300kb (2X)   | Yes              | Tray    | £85                                |   |                                  |               |   |
| Aztech CDA468-01 (AZ)     | 235ms  | 600kb (4X)   | Yes              | Tray    | £139                               | NEW   |                                  |               |   |
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| Mitsumi FX400 (MT)        | 230ms  | 600kb (4X)   | Yes              | Tray    | £130                               | NEW   |                                  |               | RECORDER  |
| NEC Quad 4X (PC)          | 220ms  | 600kb (4X)   | Yes              | Tray    | £159                               | NEW (+Encarta 95)                             |                                  |               |   |
| Pinnacle Micro Dual Speed | N/A    | 307kb (2X)   |                  |         |                                    | £1429 (2a) includes recording s/w for Windows |                                  |               |   |
| Philips CDD522            | N/A    | 330kb (2X)   |                  |         |                                    | £1780 (2a) + Win-on-CD To Go                  |                                  |               |   |
| Yamaha Quad 4X            | N/A    | 600kb (4X)   |                  |         | £2390 (2a)                         | £2590 (2a)                                    |                                  |               |   |
| WIN-ON-CD S/W (Full)      |        |              |                  |         | £690 (b)                           |   |                                  |               |   |
| COREL Record S/W          |        |              |                  |         | £165 (b)                           |   |                                  |               |   |
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| Bookshelf 94 (MPC,MS)                                      | £59      |
| Classical Library (MPC,AI)                                 | £33      |
| Complete Works Of Twain (MPC,BD)                           | £20      |
| Factomatic: Executive, Sales Manager, Negotiators (MPC,FA) | £29 each |
| Great Literature + (MPC,>500 works,BP)                     | £34      |
| Illustrated Shakespeare (AP)                               | £14      |
| Illustrated Sherlock Holmes (AP)                           | £14      |
| Informagic Standards (ANSUSO etc,IF)                       | £25      |
| Issac Asimov's Ultimate Robot (MPC,MS)                     | £31      |
| Jane Austen (NB)   | £17      |
| Living poetry (AP)   | £27      |
| Lewis Carroll (NB)   | £17      |
| Monarch Notes (BP)   | £54      |
| Monarch Notes for Windows (MPC,SP)                         | £43      |
| Project Gutenberg (WC)                                     | £19      |
| Stories Of Murder Mystery & Magic (101 tales)              | £14      |
| The Bronte Sisters (NB)                                    | £17      |
| Wines Of The World (MPC,BS)                                | £29      |

## MAGAZINES & NEWSPAPERS

|  |     |
|--|-----|
| CD-ROMS Of CD-ROMS (RI)                      | £15 |
| ITN World News 93 (MPC,MD)                   | £39 |
| Mindscape CD Sampler (ST)                    | £6  |
| Newsweek Interactive 2 (ST)                  | £17 |
| The Daily Telegraph 92 (MPC,AC)              | £99 |
| Time Mag Almanac 92 + QA factbook (DOS,CP)   | £50 |
| Time Mag Almanac 1993 (DOS,CP)               | £89 |
| Time Mag Almanac 1994 (MPC,CP) NEW           | £89 |
| (Mindscape+Attica+Microsoft,TR) Sampler Tiro | £12 |

## MUSIC

|   |     |
|---|-----|
| Beethoven's 5th (MPC,ST)                  | £21 |
| Beethoven (MPC,MS) "9th Symphony"         | £31 |
| Composer Collection (MPC,MS)              | £49 |
| Composer Quest (MPC,educational,DT)       | £43 |
| Ebook Mozart (MPC,ST)                     | £25 |
| Grooves (MPC,100 music accompaniments,MD) | £69 |
| Introduction To Classical Music (MPC,AC)  | £39 |
| JAZZ: A Multimedia History (MPC,ST)       | £27 |
| Mozart (MPC,MS) "The String Quartet"      | £31 |
| Musical Instruments (MPC,MS)              | £31 |
| Prince Interactive (PI)                   | £29 |
| Soundbites (MPC, cartoon,film,world,each) | £21 |
| Schubert (MPC,MS) "Trout Quartet"         | £31 |
| Stravinsky (MPC,MS) "Rite Of Spring"      | £31 |
| Strauss (MPC,MS) "Three Tone Poems"       | £31 |
| Tchaikovsky's 1812 Overture               | £25 |
| Viking Opera Guide (MPC,AC)               | £75 |
| Soundbites are floppy based.              |     |

## PROGRAMMING

|                               |      |
|-------------------------------|------|
| C Users Group Library (WC)    | £19  |
| Macromedia Action (MPC,MM)    | £POA |
| MS Multimedia Viewer (MPC,MS) | £195 |
| Source Code (WC)              | £25  |

## RELIGION

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|--|-----|
| Bible Library (EE)                     | £27 |
| Creation Stories (OT)                  | £29 |
| First Electronic Jewish Bookshelf (JW) | £59 |

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| Illustrated Bible (Bible+pics,easy to use,AP) | £14 |
| King James Bible (MPC,BS)                     | £19 |
| Old Testament (OT)                            | £38 |
| World Religions (MPC,QP)                      | £39 |

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| Complete House (MPC,CA)                             | £25  |
| Computer Works (OT)                                 | £24  |
| Electricity & Magnetism (BR)                        | £24  |
| Exploring Earth Sciences (MPC,AC)                   | £160 |
| Jets & Props (Media Clips,AE)                       | £17  |
| Science Adventure II (KA)                           | £27  |
| Sentimental Wings (MPC,Old aircraft,WC) NEW         | £18  |
| Speed Adventure (KA)                                | £35  |
| The Interactive Periodic Table (MPC,AC)             | £74  |
| The Way Things Work (MPC,DK)                        | £42  |
| The Eyewitness Encyclopedia Of Science (MPC,DK) £42 |      |
| Warplanes Vol II (MPC,War's makers of Redshift)     | £31  |
| World Of Flight (Plane Pictures,OT)                 | £19  |
| World Of Trains (Train Pictures,OT)                 | £19  |
| Issac Asimov's Ultimate Robot (MPC,MS)              | £31  |

## SHAREWARE

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|--|-----|
| Dr Shareware (DR)                        | £10 |
| Gen Shareware Vol V (MH Black box) £8    |     |
| Giga Games (Shareware,WC)                | £8  |
| High Voltage Shareware (4-CD,summer 94)  | £22 |
| Kirks Comm Disk (modems etc,July 94,WC)  | £18 |
| Nebula (NEXT OS Intel,WC)                | £15 |
| Scientific Library (shareware,Aug 94,WC) | £18 |
| Shareware Overload Trio (3-CD,CH)        | £14 |
| Simtel Repository (2-CD,Sept/Oct 94)     | £16 |
| So Much Shareware Vol 3 (PU)             | £9  |
| Ultimate Shareware Vol 2 (PU)            | £9  |
| Win Platinum (OT)                        | £29 |
| WorldVision Shareware 2 (3-CD,OT)        | £17 |

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| Fine Artist (MPC,MS)                       | £28 |
| Mavis Beacon Teaches Typing V2 (MPC,ST,UK) | £16 |
| MS Works For Windows (MPC,MS) v3           | £82 |
| Composer Collection (MPC,MS)               | £49 |
| MS Creative Writer (MPC,MS)                | £28 |

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| Earth And Universe (BT)                            | £27 |
| Interactive Space Encyclopedia (DOS,Path,Moore,AI) | £26 |
| Interactive Space Encyclopedia (MPC,Path,Moore,AI) | £32 |
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| Redshift (MPC,XX) BEST SELLER                      | £39 |
| Return To The Moon (MPC,explore moon,LE)           | £19 |
| Small Blue Planet                                  | £35 |
| So Much Space (400 pics,PU)                        | £15 |
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| Space Adventure (OT)                               | £29 |
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| Clipart Warehouse (Was Goliath,CH)          |  |
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| Ham Radio (Shareware,CH)            |  |
| Hobbes OS/2 (Shareware,Aug 94,WC)   |  |
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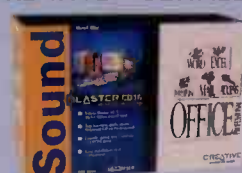
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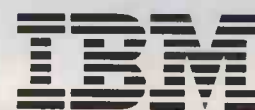
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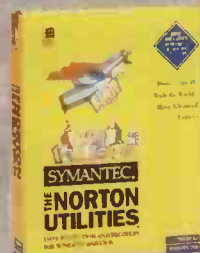
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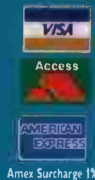
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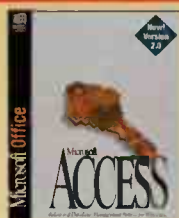
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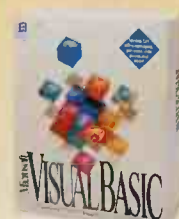
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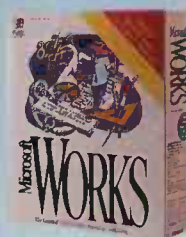
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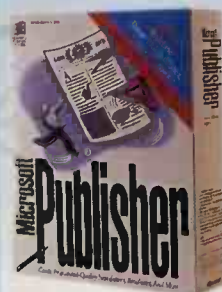
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### PROFESSIONAL

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IF YOU OWN

|                |                           |             |               |
|----------------|---------------------------|-------------|---------------|
| Borland Office | WordPerfect (any Version) | Quattro Pro | Presentation  |
| Envoy          | Any Network Client        | InfoCentral | GroupWise     |
| WordPerfect    | Office                    | Inform      | SoftSolutions |
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- Single point of admin
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- Simplified user access

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- Macintosh Support built in
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- Better data transfer rate
- Improved Routing
- Improved WAN traffic capability
- Supports Pentium 4Mb memory transfer

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- Digital Signature
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- Advanced System Reliability

### Enhanced Connectivity

- MSDos, MS Windows, NT, OS/2, Mac, Unix client support
- Improved Scalability
- Built-in Routing services
- Multi-Platform and Host Access Add-ons
- Enhanced Add-on Services



### Check Out Netware 4.1

- ✓ Improved File Services
- ✓ Print Services
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- ✓ Enhanced Security
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- ✓ Multi Protocol Routing
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| LT53 132 | Lotus 123 V5 Win I Lic              | 195 |
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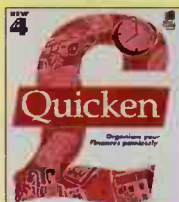
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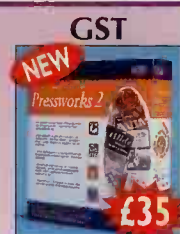
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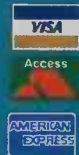
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| M130 T30 | Micrologic True Type Dos       | 62  |
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| MG40 C13 | Micrografix Charisma Win            | 181 |
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| ZN30 Z29 | ZScript Win                         | 149 |
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| MS77 P43 | MS Project V4 Upg CCP                      | 85  |
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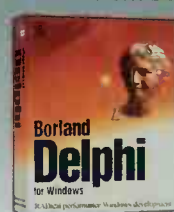
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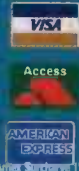
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| LT60 C29 | CcMail Group Pack 10 Users         | 465  |
| LT53 C62 | CcMail Lan System Lic Pack 10 User | 446  |
| LT61 N23 | Lotus Notes Starter Pack Win       | 587  |
| LT61 N54 | Lotus Notes Suite CD               | 757  |
| LT53 N32 | Lotus Notes Suite 1 LLP Pack       | 453  |
| LT61 N19 | Lotus Notes Express Win            | 133  |

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| WP60 G13 | Novell Groupwise Client (S) Admin Pack Dos 369 |      |
| WP60 G16 | Novell Groupwise Client (S) Admin Pack Win 369 |      |
| WP53 G12 | Novell Groupwise Additional 1 user licence     | 79   |
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| CV27 C69 | CompuServe Membership Kit Win    | 19   |
| DT27 D44 | *Datatalk V4 Dos/Win             | 39   |
| DT27 D53 | Datatalk V4 Plus MNP             | 129  |
| SK27 M22 | Mirror III UK                    | 110  |
| DS27 P12 | Procomm Plus v2.01 Dos           | 54   |
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|----------|---|-----|
| MC27 C42 | Carbon Copy V6.1 Dos                      | 74  |
| DC27 C54 | Carbon Copy Win                           | 74  |
| TR27 C38 | Commonworks Win (Inc Laplink Dos)         | 69  |
| TR80 L64 | Laplink V5 Dos                            | 58  |
| TR80 L73 | Laplink Win                               | 84  |
| SV27 R23 | STAC Reachout Modem Host/View Win         | 99  |
| SV27 R26 | STAC Reachout Modem Host Win              | 68  |
| SV27 R29 | STAC Reachout Modem View Win              | 138 |
| SV27 R16 | STAC Reachout Modem 4 user Lan Add-on Win | 535 |
| SY27 P23 | PC Anywhere V5 Dos Host + Remote          | 82  |
| SY27 P76 | PC Anywhere V5 Dos Host Only              | 58  |
| SY27 P83 | PC Anywhere V5 Dos Remote Only            | 65  |
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| SY27 P46 | Norton PC Anywhere V2 Win Host            | 57  |
| SY27 P49 | Norton PC Anywhere V2 Win Remote          | 67  |

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|          |                            |     |
|----------|----------------------------|-----|
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| WK27 R44 | Reflection 4 Win           | 249 |
| PE27 S13 | Smartterm 320 Dos          | 95  |
| PE27 S23 | Smartterm 340 Dos          | 159 |
| PE27 S26 | Smartterm 340 Win          | 159 |
| PE27 S43 | Smartterm 420 Win          | 125 |
| P127 T23 | Termite Async Dos          | 169 |
| P127 T33 | Termite Async Win v6 New   | 169 |
| P160 T53 | Termite Network Dos        | 249 |
| P160 T63 | Termite Network Win v6 New | 249 |
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|          |                                    |     |
|----------|------------------------------------|-----|
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| DL27 W34 | Winfax Pro V4 Win                  | 53  |
| DL27 W52 | Winfax Pro V4 Upgrade              | 33  |
| DL60 W23 | Winfax Pro V4 Server + 2 Users     | 185 |
| DL60 W19 | Winfax Pro V4 Lan Server only      | 98  |
| DL60 W30 | Winfax Pro V4 5 Pack               | 265 |
| DL60 W32 | Winfax Pro V4 10 Pack              | 409 |
| WP45 E59 | WP Express Fax Plus Win            | 36  |
| DL27 C22 | Dosfax Pro Dos                     | 45  |
| RM27 T46 | Trio Datafax                       | 89  |
| RM27 T43 | Trio Datafax Lite Win              | 20  |
| LS27 E13 | Eclipse Fax Server + 2 User        | 199 |
| LS27 E43 | Eclipse Fax 2 User                 | 140 |
| LS27 W23 | Winport 1 Modem Sharing            | 225 |
| LS27 W26 | Winport 2 Modem Sharing            | 299 |
| LS27 W33 | Winport 5 Modem Sharing            | 425 |
| LS27 W46 | Winport For Windows for Workgroups | 99  |
| LS27 W49 | Winport For Lantastic              | 99  |
| Z527 U19 | Ultrafax Win                       | 38  |

### TCP/IP & INTERNET

|          |  |      |
|----------|--|------|
| SU60 P68 | PC NFS V5.                                     | 289  |
| NM27 C23 | Chameleon NFS Win                              | 310  |
| NM27 C29 | Chameleon TCP/IP Win                           | 275  |
| NM27 C26 | Chameleon NFS 32                               | Call |
| NM27 N26 | Internet Chameleon                             | 135  |
| FR27 S49 | Super TCP/IP                                   | 310  |
| QD80 D53 | Desqview/X V2.0                                | 139  |
| S127 I22 | SPRY - Internet in a Box Win                   | 109  |
| S127 A24 | SPRY - Internet Office Solutions Win           | 235  |
| SU60 P42 | PC NFS Software only                           | 245  |
| FR27 S46 | Super TCP/IP NFS                               | 345  |
| XXXX XXX | Ventura Internet Membership Kit                | 29   |
| CDOS E01 | Hitchhiker on the Information Highway CD Tutor | 79   |



# PROBLEMS?...

**A** Find the one that does not belong.

1. TRACROS  
TEADS  
LEPAPS  
RESHICER  
BABECAGS

2. HARC  
NOPEY  
PYPOP  
CUTREBPUT  
LIPUT

**B** Insert the missing letters.

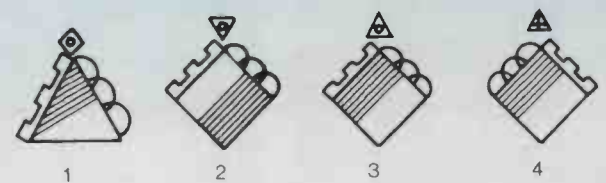
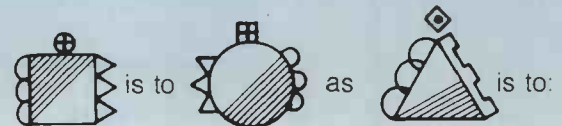
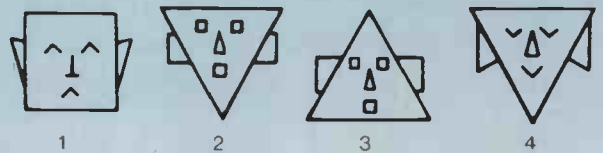
|   |   |   |   |   |
|---|---|---|---|---|
| 1 | R | V | K | O |
|   | N | P | C |   |

|   |   |   |   |  |
|---|---|---|---|--|
| 2 | B | F | J |  |
|   | V | Q | L |  |

**C** Add the letter that completes the series.

|    |  |    |  |
|----|--|----|--|
| FL |  | SL |  |
| TH |  | P  |  |
| R  |  | BL |  |
| K  |  | CR |  |
| P  |  | D  |  |
| S  |  | K  |  |
| W  |  | S  |  |
| ST |  | W  |  |

**D** Insert the missing figures.



**NO PROBLEMS  
JUST ANSWERS**

**Answers to this month's problems**

**A) CHERRIES** (All the other words have A in them: carrots, dates, apples and cabbages.)

**B)**

**1** E (The letters at the bottom precede the letters at the top by 4, 6, 8 and 10 letters in alphabetical order.)

**2** N and G (The letters on the top row move forward in alphabetical order, skipping three letters each time. The letters on the bottom line move in the opposite direction, skipping four letters each time.)

**3**

**1** ING  
**2** EEP  
**3** UP, points down.  
**4** (The bottom shape and the top shape change places, the figure inside the top shape remains, but the shaded and unshaded areas in the bottom shape change places. The decorations on the right and left of the main figure change places.)

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| 2. Company name  |  |   |  |
| 3. How many staff are employed at your location?                           |  |   |  |
| 10 <input type="checkbox"/> 1-9  | 11 <input type="checkbox"/> 10-24        | 12 <input type="checkbox"/> 25-49       | 13 <input type="checkbox"/> 50-99      |
| 14 <input type="checkbox"/> 100-249  | 15 <input type="checkbox"/> 250-499      | 16 <input type="checkbox"/> 500-999     | 17 <input type="checkbox"/> 1000+      |
| 4. What is the annual budget of your DP department, excluding staff costs? |  |   |  |
| 18 <input type="checkbox"/> £0-£24k  | 19 <input type="checkbox"/> £25-£49k     | 20 <input type="checkbox"/> £50-£149k   | 21 <input type="checkbox"/> £150-£499k |
| 22 <input type="checkbox"/> £500-£999k                                     | 23 <input type="checkbox"/> £1-5 million | 24 <input type="checkbox"/> £5 million+ |  |
| 5. What is the annual turnover of your company?                            |  |   |  |
| 25 <input type="checkbox"/> Up to £5m                                      | 26 <input type="checkbox"/> £5m-£10m     | 27 <input type="checkbox"/> £10m-£25m   | 28 <input type="checkbox"/> £25m-£50m  |
| 29 <input type="checkbox"/> £50m-£100m                                     | 30 <input type="checkbox"/> £100m+       |   |  |

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- 33 ☐ Mining, chemicals, metals & minerals
- 34 ☐ Metal goods, engineering, electronics & vehicles
- 35 ☐ Computer manufacturer
- 36 ☐ Systems OEM
- 37 ☐ Other manufacturing industries
- 38 ☐ Construction
- 39 ☐ Retail, distribution, hotels, catering & repairs
- 40 ☐ Computer dealer/reseller
- 41 ☐ Transport & communication
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# Newsprint

## Cable companies to storm the Web

Cable companies are about to launch into the Internet in a big way with a full Web service, promising speeds that make today's fastest modem data rates look like a crawl.

The 16 companies, mostly American, have been holding talks to co-ordinate their approach across Britain, says David Venn of the London Interconnect Group. The first services could be running in as soon as a month.

Cable companies have local franchises and their Net services will have a strong community flavour along the lines of many US providers; but they will also offer access to the wider Internet world. The initial demand is expected to be for email, but the local connection will enable business uses such as online pizza parlours.

Sadly, the initial links will be at only a stately 14.4kbps. But Nick Austin of Cablenet, which has been developing software for the new services, says this will seem fast because there will be minimal delay at the servers, which will be primed to cope with a lot of users: "The cable companies are very big indeed and they have a lot of money. If they are going to do a thing, they are going to get it right."

High-bandwidth services will follow quickly,



*This forties shot of Marlene Dietrich is one of 70,000 at the wonderful Hulton Deutsch picture library (0171 266 2660) now online to ISDN-2 users*

says Nial Hickey of the Cable Communications Association, formed by the big 16. Their optical fibre links can carry huge amounts of data but usually reach only to local nodes, each serving 50 or more homes via co-ax cable capable of carrying several TV channels simultaneously.

One London company, Videotron, is experimenting with 10Mbps Ethernet links, which effectively unite neighbourhood PCs into a local network.

Clive Akass

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## Scallywag in Net libel challenge

Scallywag magazine appeared to be cocking a snook at the UK libel laws as we went to press by posting on a US Internet server a copy of a scurrilous article that got it closed down.

The article is nastier than Scallywag's jaunty title might lead

you to expect. Among its milder claims is that Dr Julian Lewis, head of the Conservative Party's research department, tried to dig up dirt on Tony Blair for pre-election smears. The magazine was sued for libel last year by John Major. It suspended operation in

February when Dr Lewis began legal proceedings against its distributors and retailers.

If he were to sue over the Net posting, the stage would be set for a high-profile test case that would address many of the legal questions raised by the Internet.

One possibility under catch-all UK law is that a server owner could be held liable for a libel, which could cripple the Usenet system. But of course the offending article was posted in the US.

Dr Lewis was livid but said there was no point suing Scallywag editors Stephen Regan and Angus James Wilson because they have no money. He wanted to get his current libel action over with. "If there is something more to be done, then you can count on me to do it," he said.

Plextor is shipping the world's first six-speed CD-ROM drive, boasting a data transfer rate of 900kbps — six times that of early models.

The £410 6PleX boasts a 256kb buffer to improve data flow and an average 145 milliseconds access time. The drives fit into a standard

### Fastest CD drive yet

half-height PC bay and Plextor also plans to pack multiple units into drive towers.

Dealers: Tekdata 01782 577677; Ambar 01296 311300; Ingram Micro 01908 260422

**P6 and the M1 line up for the next-generation chip wars — see page 294**



## Short Stories

Let's TALK  
voice recognition

● A Canadian firm has entered the UK voice recognition market with a Windows product it claims is the start of the evolution of a true sound interface.

Kolvox OfficeTALK uses Kurtzweil's Applied Intelligence recognition engine with direct calls to applications to speed up execution of spoken commands.

It will be sold here through the Software Compatibility Centre for £1,100, complete with PC board and mike.

SCC 01344 885224

## Cheap 3D

● Visual Software's £69 3D graphics program, Simply 3D, comes on a CD and includes text, animation, 100 3D objects and 70 textures. Its Visual Reality 1.5 contains two CDs of clip art and textures for £299. Simply Scene, a collections of 3D models, costs £49, and Textures for Professionals costs £99.

Visual Software 01481 714572

## Reflex action

● Reflex has launched anti-virus software aimed at large-business users. Datanet protects the server by refusing disks that have not passed by the administrator.

Reflex 0171 372 6666

## Teletext card

● Win/TV Prisma, £199 from Hauppauge Computer Works, lets you watch TV and capture Teletext on your PC. You can also link up a video recorder/camera for 24-bit frame capture.

Hauppauge Computer Works  
0171 378 7309

## Xara's Corel killer

● Xara, the company set up by Computer Concepts, launched Xara Studio, previously known as Camelot, which is claimed to be easier and up to 20 times faster than any existing graphics package. It will ship in the late spring at a cost of £199 or £99 to Corel users.

Xara Ltd 01442 350000

Cebit show ushers in the  
post-Pentium processors

Intel showed off its next-generation P6 chip last month at Cebit, the world's largest computer show. Also at the fair in Hanover was Cyrix, boasting that on Intel's figures its new M1 would outperform the P6.

Even Steve Domenik, Cyrix's vice-president of product marketing, admitted this claim was shaky. "The only way you will tell is to put these things into actual systems and test them," he said.

Presenting the P6 was Intel's splendid John Hyde, the kind of man you can imagine devouring assembler code for breakfast. His accent hovers uncertainly between Oregon and his native Wales and he refers to the P6 as "he", like a farmer discussing a favourite bull.

The P6 deals with many instructions at once, Hyde said. "He [the P6] looks at 20 or 30 instructions and tries to see what you are trying to do with the logic... typically he is executing all these instructions in a totally different order from how they are written." The P6 (above) is two



chips in one container: 256kb of cache memory with 16 million transistors, and the processor itself with 5.5 million. The first versions will run at 133MHz.

Advanced superpipelining (performing different phases of a calculation simultaneously) chops the logic into smaller steps than on the Pentium, which in practice means the P6 can be clocked faster. Intel logic goes thus: the P6 processes 34 percent faster than a notional Pentium of the same clock rate; superpipelining means the 133MHz P6 can be made on the same 0.6 micron process as the 100MHz Pentium; therefore the 133MHz P6 should be compared

to a 100MHz Pentium; therefore the P6 is twice as fast as the Pentium.

Both Intel and Cyrix claim similar tricks to get more performance, though Hyde vomited air to indicate his contempt at some of Cyrix's claims. ("You have to excuse him: he's been very close to the P6," said Intel's PR man.) The

tricks include using extra registers, parallel processing, and second guessing what a program is going to do.

The M1 has one advantage. It will go into existing Pentium motherboards with minimal changes; the P6 will require a new design.

And there is a more subtle factor. Cyrix's Domenik said: "Intel has for years been held up as some kind of arbiter of compatibility. But over the past 18 months that has gone. The Pentium bug destroyed it for ever."

The first M1 chips are due out in the next few weeks; the P6 is slated for autumn.

Intel 01793 696000; Cyrix 01973 4177

## Warp booms in Win95 delay

Microsoft's rivals are looking increasingly buoyant in the long run-up to Windows 95, now slated for an August launch. Few predict that Bill Gates's next-generation operating system will flop but he may never regain the near-complete dominance he won with Windows 3.x.

Sales of IBM's rival OS/2 Warp have topped the software charts in several countries, reaching a claimed 600,000 in Germany alone, though UK sales have been sluggish.

Chart positions do not account for software pre-loaded onto new machines; but here again Microsoft lost leverage when it agreed last year to end its practice of obliging vendors to buy a copy of Windows 3.x for every PC sold — so that anyone wanting a rival system had in effect to pay twice.

Vobis, Germany's leading PC vendor, has been pre-loading OS/2 with Windows onto its machines for weeks. Chairman Theo Lieven said the Vobis market share and sales had been "very good" over the period. Toshiba

issued an odd statement giving three pages of guff about how its machines would be Windows 95 ready — and adding, as a by-the-way, that it was preloading current models with both OS/2 and DOS/Windows.

The line of IBM sales executives is that they are offering the best DOS around (see page 306), the best and best-tried 32-bit mainstream operating system, and the best route to the object-oriented future.

IBM software sales executive John Soyring claims Windows 3.11, running on top of OS/2 Warp, makes even better use of memory than Win95. "Under Warp you can set up a separate virtual machine for each application."

Microsoft has signed a deal to put a version of the respected file viewer Outside In into Win95. It cannot afford to stand still: Apple brass-faced into the Windows 95 show looking very good indeed (see page 311), showing if nothing else that Microsoft has some hard acts to beat.

Clive Akass



## Sad Kevin hacks himself a fan club

Kevin Mitnick's arrest last month as the "world's most wanted hacker" surely confirmed that life in the US imitates television. Security expert Tsutomu Shimomura was cast as a kind of cyber-age Philip Marlowe dropping all to pursue the man who dared to break into his computer. At least one book and a film are planned, and a fanzine of Mitnick is available (browse alt.2600).

In Britain, the story served at least to present newspapers with a real hacker. They have taken of late to referring to all crime involving computers as hacking, though the vast majority is simple fraud. Hackers themselves take such niceties very seriously and prefer the term "cracking" for what Mitnick got up to.

This deserves study by Net users; basically he exploited a relationship of trust between two machines, so that having got into one he could reach another. An account by victim Shimomura has been posted in newsgroups including alt.security. Mitnick, aged 31, faces 20 years in prison and a fine of up to \$250,000 if found guilty



of all charges, which is by no means certain. His former therapist described him as a "sad, lonely, angry, isolated boy". Defenders say his activities were relatively harmless and exposed security gaps, and that if he did not exist, security experts would have to invent him.

## "Market forces" police new PC card standard

PCMCIA leaders went to Cebit last month to explain the latest version of the standard covering device cards — and admitted the organisation still could not guarantee that the next generation will work with all PCs.

The very name PCMCIA, short for Personal Computer Memory Card International Association, shows one reason. The organisation was set up by manufacturers to set a

standard for memory cards. Version 1.0, announced in 1990, quickly proved inadequate as card slots came to be used for everything from hard disks to navigation aids.

A series of amendments, including optional specifications, produced such confusion that there was no knowing whether a card which worked in one machine would work in another. Card installation has become much less hit and

miss but there can still be problems. Some stem from using new cards with old machines, but some manufacturers are also said to be screwing up the software.

The new standard (see below) complicates matters by allowing for two line voltages (5v and a power-saving 3.3v) and a new 32-bit bus; 3.3v cards won't fit into 5v slots. The first 32-bit cards are expected later this year.

The PCMCIA sees its job as setting standards rather than policing them, which president Stephen Harper says can be left to market forces because cards that don't work won't sell. "We could set up a lab to test products but it would take years to do properly."

● Psion has launched the £129 Gold Drive drive, which fits into a standard 3.5in bay and takes any PCMCIA card.

Psion 01908 261686 **Clive Akass**

## Even the name has changed

PCMCIA cards should now be called PC cards. That is official... although whether users will drop the clumsy acronym, after five years of getting used to it, is an open question. The organisation's name is unchanged, so the term PCMCIA card is arguably still valid. Other important changes include fast direct memory access (DMA), power management, improved storage formats, and support for multi-function cards. Most important for plug-and-play operation is that cards are now obliged to hold configuration details that the host machine can read. This card information structure (CIS) has also been tightened up and made easier to implement. The new 32-bit CardBus is designed for tasks like full-motion video and 100Mbps Ethernet links.

### Short Stories

#### Digital cameras get cheaper

● Kodak is set to launch a digital camera with interchangeable lenses for less than £600 in the US.

The DC 40 uses the same CCD sensor as Apple's QuickTake, which Kodak co-developed. The £374 QuickTake camera can capture only 12 pictures before download but the DC 40 can store 48 pictures in its 4Mb of RAM. It will hit the US market by early summer.

#### Foreign Accent

● Accent has launched two multilingual word processors. Accent Express, at £39, supports type in 34 languages and has 15 menu languages. Accent Special Edition, at £119, has spell checking and thesaurus in English, French, German, Spanish and Italian.

Accent 071 490 0212

#### Solomon's glory

● Dr Solomon v7 comes in versions for Windows and DOS, DOS, NetWare and OS/2. It costs from £99, with three quarterly upgrades.

S & S 01296 318700

#### Delrina netted

● Delrina's new WinComm Pro email package is set up for linking to a number of European Internet providers. It costs £99, or £129 bundled with WinFax Pro.

Delrina 0181 207 3163

#### 2.1Gb bay

● Storage specialist Teac has packed 2.1Gb of fail-safe storage into a standard PC 5.25in drive bay. The £3,550 TR-405 system packs five 540Mb hot-swappable disks into a bay and offers RAID levels 3 and 5.

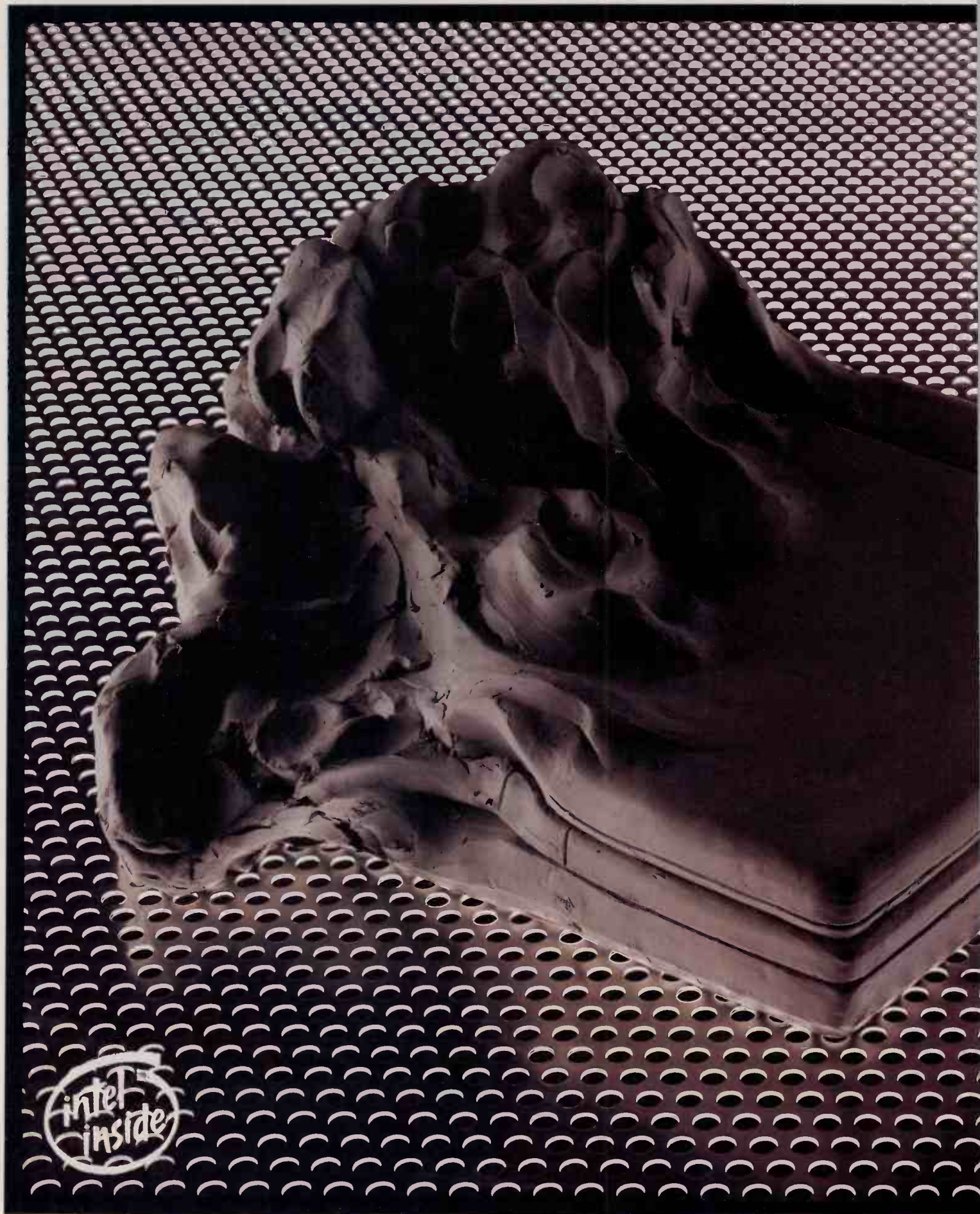
TEAC 01923 225235

#### One Stop OS/2

● One Stop Software has set up as a one-stop shop for OS/2 products, claiming comprehensive technical support and the most complete selection of applications and development tools available in the UK.

One Stop 0117 985 3370





The new Toshiba T2150CDT is like putty in your hands. Think of a function and fashion the Toshiba into it. CD-ROM lets you mould your portable into anything, from a training tool to a presentation tool.

For the first time Toshiba have sculpted the many benefits that CD-ROM brings into a totally portable, portable.

We've been building high quality portable computers

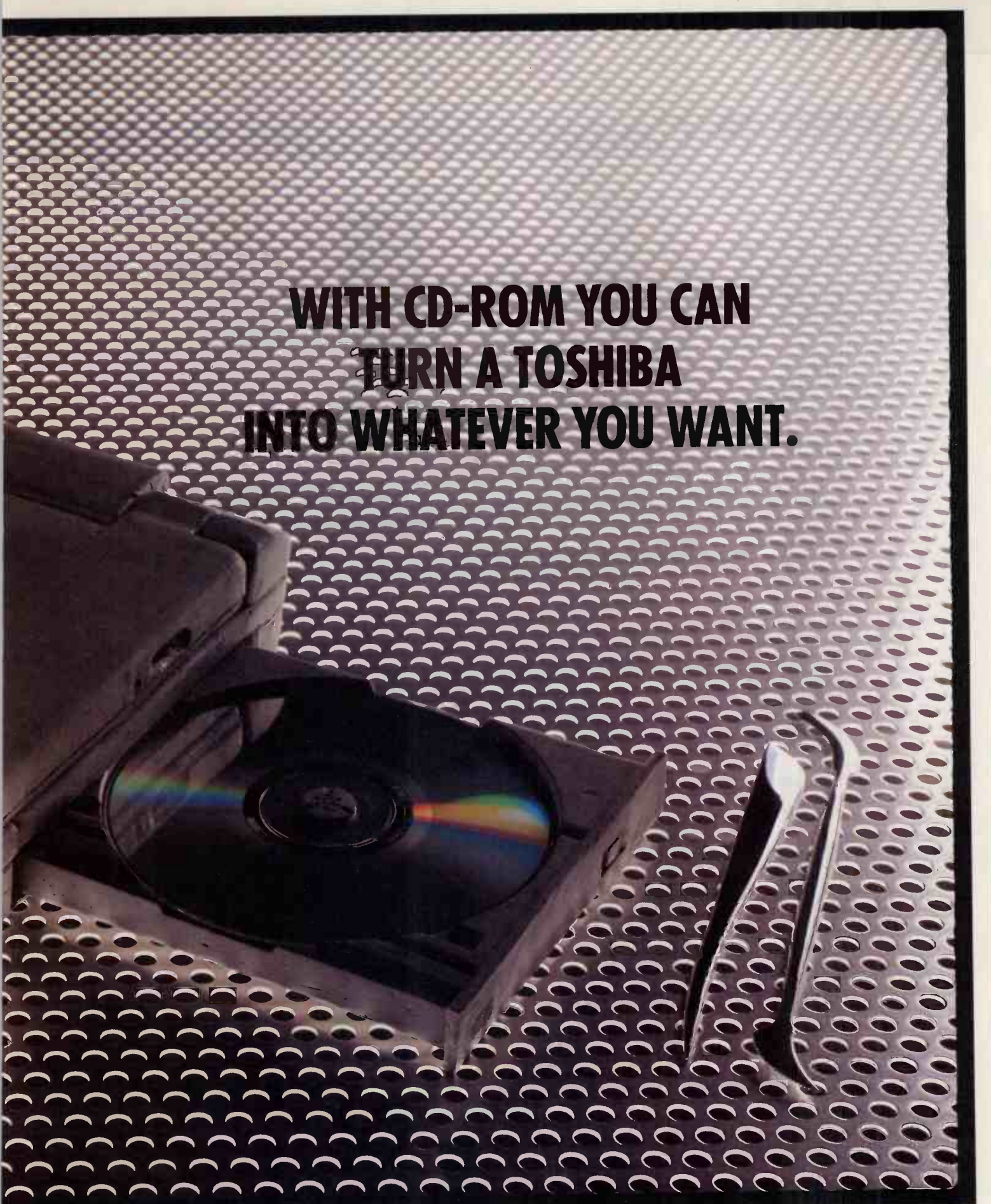


and slim-line drives for a long time, now we've used this experience and fused the two together.

When most people think of CD-ROM, 'multimedia' springs to mind. The T2150CDT with a 10.4" colour screen and a Sound Blaster Pro compatible sound system is justification for thinking this.

But CD-ROM gives you much more than just multimedia capabilities. It also puts thousands of new





**WITH CD-ROM YOU CAN  
TURN A TOSHIBA  
INTO WHATEVER YOU WANT.**

applications in the palm of your hands. For example you could easily show customers an up-to-date spare parts and products manual, complete with illustrations and colour images.

Or you could create a personalised company training package with video clips and demonstrations.

As you'd expect from the world leader in portables we've crafted the T2150CDT into a tough, compact and reliable form. If you'd like more information please call us on

01932 828 828 and see for yourself what sort of shape the latest Toshiba has taken. The T2150CD range, anything else just doesn't compute.

In Touch with Tomorrow  
**TOSHIBA**

Toshiba Response Dept., Freepost, KT4625, Addlestone, Surrey KT15 2BR.



## Short Stories

## Changing over in time for Phoneday

● Several new programs are now available to help you prepare for Phoneday on 16th April when most phone codes will be changed.

Codechange, from Real Time Systems, works on a wide variety of formats including Windows Cardfile, Microsoft Access, and xBase databases (e.g. dBase, Fox-Pro, Clipper), delimited text and free-format text files. The price is £9.95.

Flintphone, from Flint Informatics, is written in C and works on ASCII text files. Price is £19.80, of which £10 goes to the NSPCC. And Segment Software is offering Phoneday Converter.

Real Time Systems 01232 403120; Flint 0151 357 1000; Segment 01734 724832

## WebWeek

● The first mainstream publication about the business potential of the World Wide Web is due to start in mid-April. WebWeek will be published monthly, initially, although it expects to live up to its name by moving to a weekly schedule later.

WebWeek will be published in paper form, or free of charge from publisher Mecklermedia at <http://www.mecklerweb.com>.

## Microsoft Network signups

● Microsoft Network is off to a good start with more than 50 major hardware and software vendors promising a presence. Major names include Dell, Gateway, Borland and Lotus. Compaq, the number one PC vendor, is conspicuously absent, as are Apple and IBM, who both run online services of their own.

## Cut-price Pentium from Escom

● Escom has launched a Pentium P60 for the bargain price of £899. It comes with a 540Mb hard disk, 8Mb RAM, PCI bus, a 14in monitor and a 1Mb PCI graphics card.

Escom 01294 222600

## Compaq changes the lot

Market leader Compaq has completely overhauled its DeskPro and ProLinea ranges of desktop PCs with 38 new models. All use Compaq's Triflex PCI chipset which is claimed to offer better performance than Intel's standard chipset.

All machines are now easier to service. Motherboards can be changed by removing just three thumbscrews in as little as four minutes. The company has also repositioned the two ranges. Performance



is now very similar between the two ranges but the emphasis of the ProLinea (left) is on value whereas that of the DeskPro is on network readiness.

A new ProLinea 575 with a 75MHz processor, three slots, three bays, 270Mb hard disk, 8Mb RAM and 256kb cache will have a typical buying price of £1,415. The equivalent DeskPro

with Ethernet on the motherboard and Intelligent Manageability will cost £1,625.

● See News Analysis page 314

## It's all aboard the mobile dataphone bandwagon...

**B**andwagon of the month has been mobile communications, with just about every major manufacturer announcing GSM data phone cards to slot into portables. The devices plug into GSM phones which can be used to send fax and data as well as for voice calls.

At Cebit, Motorola and Sony both showed off their pen-driven communicators which use General Magic's Magic Cap graphical interface.

Nokia and Philips demonstrated phone card devices. Philips showed its version (apparently a rebadged Nokia) working with a Sony communicator to get travelling information, using "intelligent agents" created using General Magic's Telescript language.

No European information provider yet supports Telescript. But Philips revealed that it is working with providers across

*Sharp has turned its back on the Newton, the pen-driven personal digital assistant (PDA). It co-developed with Apple. Sales of both Apple and Sharp versions of the machine have been limited largely to niche markets which do not depend on handwriting recognition. Oddly, the machines have done better in Japan, because Kanji script is easier for computers to read. But Sharp is backing both horses for the Western market, with a vest-pocket "personal communicator" called the Zaurus (above) which supports both pen and keyboard inputs. A custom modem will allow fax and data transmissions, and a Type II slot can take a cellphone card. The Zaurus, which has 1Mb of RAM and a custom 16-bit processor, will be available this summer for around £500.*

Sharp 0161 205 2333



Europe, including BT, with a view to getting services running in the coming months. Its new £534 mobile data card can also be used to send short messages to pagers.

A big emerging player in this

area is Amstrad, which bought Danish comms specialist Dan-call 18 months ago. It announced at Cebit that it will be producing 100,000 GSM phones a month by November — and that its order books were already full.

The company also showed off a new personal communicator called an InfoPad, along the lines of the Motorola model. The company claims it is a technological leap forward from its first PDA, which flopped two years after being launched.

Amstrad 01277 288888; Motorola 01628 39121; Sony 01932 816000; Philips 01223 444444

## Amstrad buys ailing Dataflex

As if to stress its commitment to comms (see above) Amstrad announced it had bought UK modem maker Dataflex, which went into receivership last month, for £375,000. Dataflex recently halved its prices in a bid to gain sales, and complained that Britain was not doing enough to curb "grey imports" of US modems which had not undergone the rigorous and expensive BABT testing. Modems are a hard business: US pioneer Hayes went into Chapter 11 briefly last year after cashflow problems.



# BT could help mutes speak for themselves

**B**T engineers claim their Laureate text-to-speech system outperforms other products currently available. Laureate uses a new technique which uses actual recordings of the human voice rather than synthesising speech.

Julian Page, of BT's Martlesham Heath Laboratories, said: "Laureate is real speech recorded, dissected, analysed and reconstructed."

Laureate also has some basic intelligence. It is able to detect the difference between St (saint) and St (street) from context and to read out very large numbers correctly. It also reads sentences ending with a question mark with a rising inflexion. At the demonstration organised by BT, Laureate had a pronounced Scandinavian accent but it did sound much



*Hawking could still be using his own voice if he had recorded it*

more real than rival systems.

Page cited the physicist Stephen Hawking as an example of what Laureate might be capable of. "If he'd recorded his voice before he lost it, he could have used this system to replace it," he said.

Laureate is software-only and is written in Ansi C under Unix. BT has no plans to release the product as a retail package

but sees applications in telemarketing and home shopping catalogue services, stock and money market information, allowing the police to check car registration details by dialling the Swansea computer direct, and for the disabled. For some applications, like the speaking clock, it is still more cost-effective to use recorded speech directly.

**Ben Tisdall**

Publishing giant IPC has joined with computing and photography companies to form an online service called the Instant Picture Network. Images will be stored in Kodak Photo CD format and accessed internally by special image workstations.

The Image Bank and Allsport photo agencies will also be on the network, which was set up in collaboration with Oracle, Kodak and Hewlett Packard. The group is interested

## Agencies link up for instant online pictures

in collaborating with other publishers and picture users to create an online pool of images. Nigel Davidson, managing director of IPC magazines, said: "We are creating a currency everyone can share."

IPC 0171 261 6575

## Chatterboxes get virtual bodies

Users of online "chat" areas will be able to converse as animated graphical "personalities", using a product called Worlds Away co-developed by Fujitsu and CompuServe, writes Tim Bajarin.

The new identities, called Avatars, can take part in a variety of activities such as parties, scavenging, and running a business. They can convey emotions through facial expressions and gestures, and "talk" using text and thought balloons.

Talking over one of the avatars can feel spooky at first,

when you see this creature expressing your thoughts, emotions and words. The demo avatars look like giant robots but the product will allow you to design your own.

CompuServe has a one-year exclusive on the technology, which is still in beta form. Users can get more information by typing "Go Away".

Meanwhile, CompuServe has bought up developer Spry for \$100 million in the largest acquisition yet in the Internet industry, writes Clive Akass. Spry, which

snapped up Mosaic co-developer Chris Wilson last year, publishes Internet in a Box, one of the bestselling Internet suites.

The division will form the core of CompuServe's new Internet division, formed to integrate its existing services with the wider Net. It will be headed by Spry founder David Pool, who described it as the beginning of an online convergence that "will create a single super-Internet with capabilities far beyond what we can imagine today".

CompuServe 01734 391064

### Short Stories

#### Fast digital video gets even faster

● For less than £500 you can now buy a full 60 fields-per-second video capture card from Fast Electronics. The Movie Machine II FPS60 board lets you capture and compress in realtime in M-JPEG format.

A £300 MPEG playback board can be piggybacked. Movie Machine II features S-Video and realtime editing. The £999 MMII Power Pack combines the card with the M-JPEG capture and MPEG playback piggyboards.

Fast 0171 221 8024

#### Paintshop Pro 3.0

● The new Paintshop Pro 3.0 supports more formats than previous versions, including CDR and EPS vector. It costs £69.95.

Digital Workshop 01295 258335

#### Conference cards

● MVision has videoconferencing cards for OS/2, ISA/EISA and MCA buses. They have an ISDN interface and allow leased line connectivity; prices start from £5,000.

MVision 01734 701313

#### Premiere 4.0

● Adobe has released Premiere 4.0 for Windows. New features include titling, motion control, multiple audio, video tracks and custom filters. Upgrades cost £95.

Adobe 0181 606 4000

#### Plug & Play PCs

● Elonex is to ship all its 486 and Pentium PCI PCs with Plug & Play capabilities and Windows 95 when available.

Elonex 0181 452 4444

#### Crystal gazing

● Intelligent Environments says its Crystal for Windows is the first 4GL tool designed specifically for Windows 95.

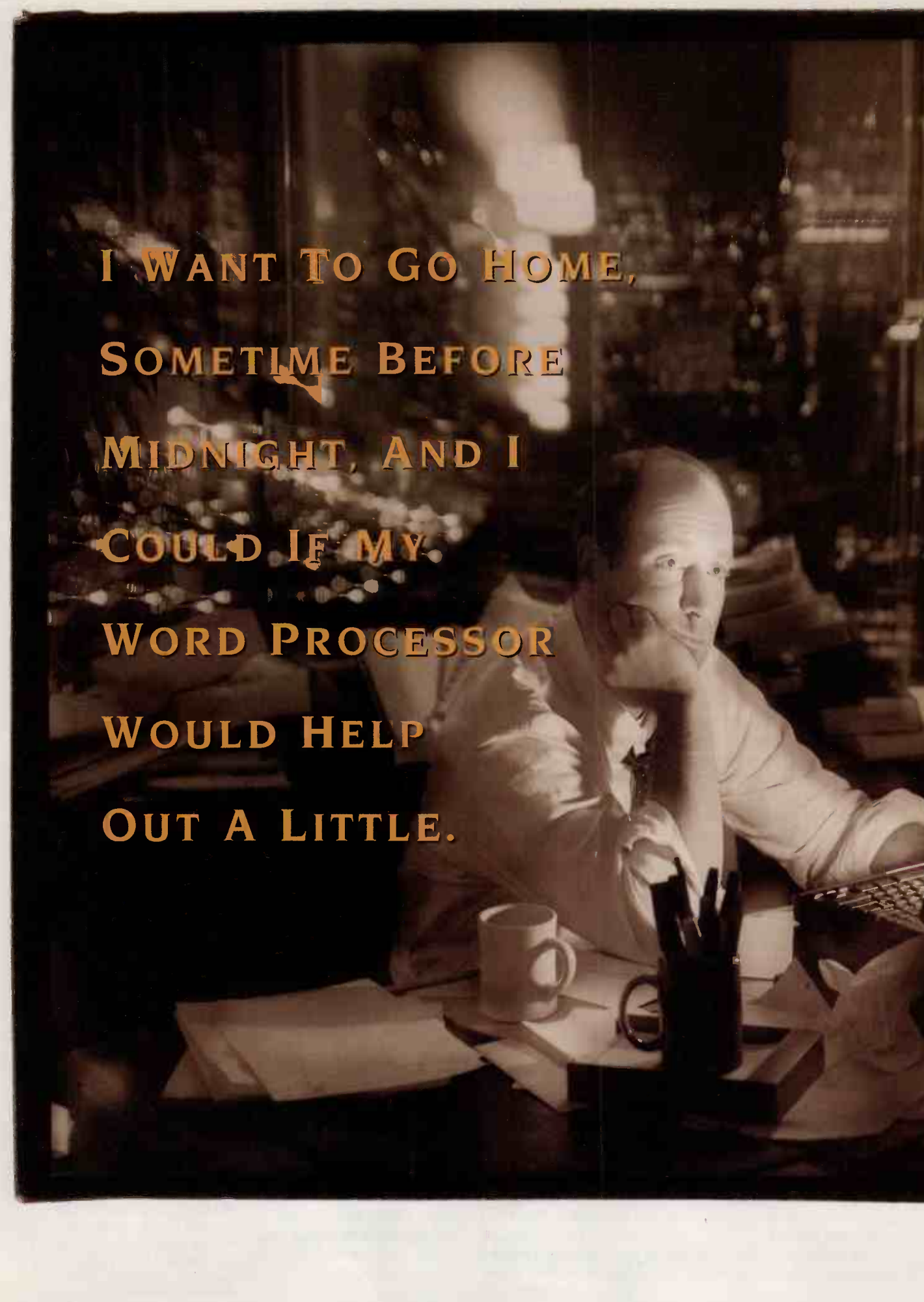
Intelligent Environments 01932 772266

#### LAN surveyor

● LAN Expert-Reporter (\$99) lets you monitor a network from a standard PC. It is ODI-compatible

Expert Telecomms 010 49 711 138 9830





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SOMETIME BEFORE  
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## Short Stories

## Combo machines

● Digital and Xerox have launched rival combined printers and fax machines. The cheaper Xerox 3000 series, at £1,139, also has the capacity to copy and the option to scan (for another £149). The Digital DEClaser 3500 at £1,600 produces 600dpi and can connect to many PCs, Macs or networks at the same time.

Xerox 01895 251133

Digital 01734 868711

## Total Robotics

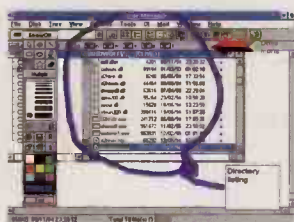
● US Robotics, a leading US and UK modem supplier following its purchase of Miracom and Megahertz, has set up a systems division to take on the UK wide-area networking market. It has introduced the Total Control network hub, initially using V.34 modem cards with Frame Relay and ISDN options to follow.

US Robotics 0173 831890

## High times

● Bits Per Second has launched HighEdit 3.0, a word processor that can be used with various programming packages, for £199. New features include a multi-level undo, full printer control and fully featured tables.

Bits Per Second 01273 727119



## Screen scrawler

● ShowOff lets you scrawl messages and pointers on a Windows screen. The image can then be captured to illustrate tutorials. It costs \$49 from OptiMicro Technologies on 0101 905 470 7016.

## Still more Doom

● CDL is offering a £14.95 CD-based Doom Developers Kit offering 650 levels for Doom 1 and 200 for Doom 2.

CDL 01483 756813

# Notebook vendors take the weight off your feet

Notebook manufacturers seem at last to be going for true portability as much as computing power. IBM and Olivetti have both launched models in the sub-notebook format, slightly smaller than A4, following the example of HP's successful OmniBooks.

The most ingenious design is IBM's Butterfly ThinkPad, in which the keyboard opens out to full size when you open the lid. It is reviewed on page 334.

Olivetti launched the Echos 20 and colour 20C, with a 9.4in screen and a smart blue case (right) that reflects the company's preferred "Italian look". Olivetti calls them "ultralights" and at 1.8kg (1.6kg mono) they weigh slightly less than the IBM, but their

weight is still appreciable. The new Echos units come with a plug-in floppy drive, a 250Mb hard disk and a 33MHz 486SX processor, and cost £1,499 with a 9.4in dual-scan colour screen.

Compaq stressed low weight when it introduced two new LTE Elite notebooks, the 4/75 CXL

and 4/75C, which offer a 10.4in active-matrix colour display and an 810Mb hard disk option. The company claims that at 6.85lb they are lighter than any in their class (the weight includes a built-in AC mains adaptor).

This compares with a weight of 6.7lb (without a mains adaptor

unit) for Texas Instruments' new 75MHz Pentium-power PCI bus TravelMate 5000, which is due to ship this month. Call for prices.



Toshiba says it saved 400g in overall carry weight by incorporating a mains unit in its new T2100 series (left), powered by a 50MHz DX2.

Models range from the mono T2100 at £1,995 to the TFT colour CT at £2,595. The company has also launched its first CD-equipped notebooks, the T2150CDs, which start at £2,695.

Mitac displayed three new Pentium models at Cebit, including one boasting MPEG video and a TV tuner.

IBM 01256 343000; Mitac 01952 207200;

TI 01932 780753; Olivetti 0181 785 6666;

Toshiba 01932 828828

## Escom in high street rumble

German vendor Escom could become Britain's largest PC retailer with its purchase last month of the Rumbelows chain from Thorn EMI.

The deal, which puts Escom into prime sites in 231 towns across Britain, will jolt an already cut-throat PC retail market. High street electronics shops have had a hard time recently, with many

closures and mergers. If Escom rides out the storm it could be well placed to take advantage of the expected convergence of computing and consumer technologies, such as TV and telephones, which will attract a new type of user.

Escom managing director Bernard van Tienen is not daunted by the challenge. "Every market is

dangerous. We are in retail and we know our business," he said.

Britain is already Escom's second largest market, and Rumbelows has been selling its machines since last October. It has also done a deal for Escom to have a presence in Office World shops. Escom sales increased 30 percent to an estimated £750 million last year.

Van Tienen said the new Escom shops would sell multimedia equipment and everything else connected with computing, such as printers, software and floppy disks.

Escom 01294 222600

## ...and ICL talks shop too

A second big player has launched itself into the high street with a vengeance. ICL, usually associated with the corporate market, will sell under the brand name Fujitsu/ICL. First models include a PC that doubles as a TV. The DX2/66 PC-TV (pictured on page 316) is equipped with a double-speed CD drive, floppy and Nicam stereo speakers.

The new "Indiana" PCs come in a "charcoal" colour. They start at about £800 for a DX2/66 with 4Mb RAM, and go up to a 75MHz Pentium with 8Mb RAM and CD drive.

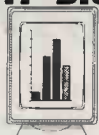
ICL's new ErgoLite notebooks come with an infra-red port and a PCMCIA faxmodem card compatible with Nokia phones. The ErgoPro business range has natty ergonomic features, including a non-static screen and a space bar that earths you each time you touch it. All machines will be available from next month through high street retailers.



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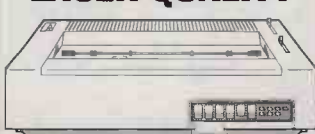
## COLOUR NOTEBOOK



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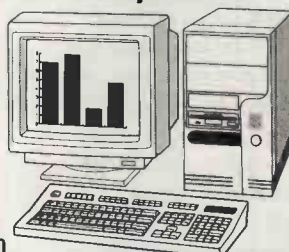


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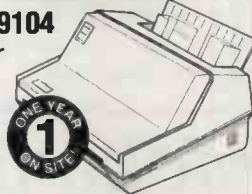
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## Web news

## VISA takes the credit for online transactions

● VISA is to work with Carnegie Mellon University on NetBill, a system to cut the cost of online transactions.

CMU's Professor Marvin Sirbu says a transaction costs 15 to 50 cents in conventional systems; NetBill's objective is to reduce this to a penny. Costs this low will enable information providers and even private individuals to make small charges for pages of data. Initially, users would set money aside in their NetBill account, which could be drawn on with each purchase.

NetBill promises that its system is secure, using the latest cryptographic techniques, and it has built-in protection for consumer privacy. It has been in development at CMU since 1991; researchers plan to test it this year by charging for information from MIT, the University of Illinois and CMU.

Information on NetBill is available from CMU's Web site at <http://www.iin.cmu.edu/netbill>; VISA information is at <http://www.visa.com/visa>.

VISA's main rival, Mastercard, has announced plans to work with Netscape Communications on a secure system for conventional credit and debit card transactions over the Internet. It expects to beat VISA to the draw, producing an operational system before July.

David Brake

## Spreading news like Wildfire

● Wildfire, a British firm, has announced a plan to distribute Usenet news through the Astra satellite. Subscribers who buy a device costing up to £80 can download as many newsgroups as they like for a flat fee of £8 to £10 a month; they need a conventional Internet account to post news.

Full details can be found at [www.tecc.co.uk/wildfire](http://www.tecc.co.uk/wildfire) or call 01603 631727.

# Apricot share deals open Windows of opportunity

Apricot and a startup company, Electronic Share Interchange, plan to extend electronic share trading to a wider public. The scheme, dubbed InfoTrade, has already been given the go-ahead by regulatory authorities and is expected to be running by September.

Private investors paying a £9.95 a month subscription will get up-to-the-minute stock information and quotes, electronic trading, financial and home banking services.

Windows software will allow users to trade automatically when the shares in their portfolio or "buy list" hit a preset price. It will integrate with existing PC finance packages and is tailored so that most work can be done offline, to keep phone bills down — although Apricot plans local

call access from most of Britain. The service is expected to be available through CompuServe and the Microsoft Network as well as Apricot's network.

ESI will take a different approach but its plans are less settled, since at press time it did not have regulatory approval. The idea for the company came from Herman Hauser, one of the founders of Acorn, and has the backing of Olivetti. While it will offer share trading facilities for existing stocks, its chief purpose is to provide an inexpensive way for smaller British companies to raise capital and for individuals to invest in such companies.

According to Hauser, a London Stock Exchange listing costs around £500,000, which makes it difficult for companies seeking £500,000 to £5 million

to fund expansion: it's too small an amount for a conventional public offering and too large for an overdraft.

Settlement in ESI's market will happen electronically and no middleman will be necessary. Companies wanting to be listed will not be required to have a sponsor, nor to show a trading record. Much of the share price and company information will be available on the Internet, but those wishing to trade will need to connect directly to ESI or through a more secure private bulletin board service like UK Online, in which Hauser also has an interest.

If the scheme is approved, the ESI software will cost £100 and a subscription will cost £15 per month plus trading costs.

David Brake

## Infobank backs CD-ROMs before Net as sales medium

Internet hype has overshadowed the CD-ROM as a medium for the display, sale and even distribution of products, according to a company launched last month in the suitably cyberstyle setting of ITN's London headquarters.

Infobank, backed by venture capitalists 3I and headed by former Microsoft UK chief David Fraser, is selling six CD-ROMs called the Corporate Collection with details of more than 1,400 products from major IT firms like Lotus, IBM and Microsoft.

But future CDs could sell anything from clothes to Christmas presents. The current CD set acts as a kind of electronic brochure, with specifications, tutorials, and even animations and sound clips. Some software can be bought straight off the discs, with the purchase of a keyword; others can be ordered via an online service. The CDs are seen as a one-stop shop for big companies, reducing administrative costs while easing sales monitoring.

Marketing director John Williams said online services are best for rapidly changing data but most information is less time-sensitive. "The future of the information industry lies in a balance between online, CD-ROM and broadcast," he said. "At the moment the power and control of the CD-ROM is not being utilised to the full." An annual



subscription costs £180 including three updates. Infobank will provide a six-CD jukebox for £399.

● Arawak Interactive Marketing is providing a CD-ROM exhibition service, with an electronic product brochure. Visitors to the Windows 95 show received an AIM CD-ROM with their programmes.

Infobank 01753 799500; Arawak 0181 802 2778

### ● Jobs by fax

Nextel Communications has set up a service called Comfax which faxes IT workers with the latest permanent and contract vacancies.

Comfax 015 1 547 1547



# SURPLUS COMPUTER STOCKS

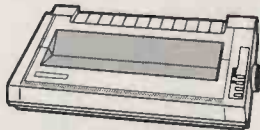
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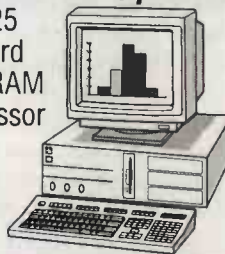


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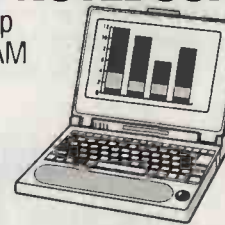
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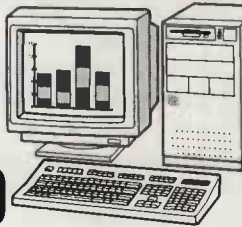


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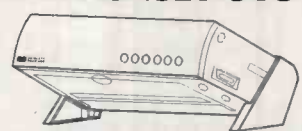
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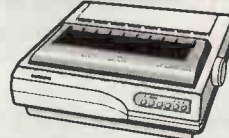
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## Short Stories

## Translator tackles Internet Babel

● Globalink, producer of the Power Translator Professional package, has bought its rival translation software company, Micro-Tac, which publishes Language Assistant.

Globalink will continue to market the Language Assistant series, which is aimed at the consumer market. In addition it is launching Power Translator Deluxe on CD which is available from the end of March for £139 in Spanish, French and German versions.

Designed for business users it offers full bi-directional translation, a dictionary of over 250,000 words and some contextual analysis of words.

Globalink is sponsoring various projects on the internet. One of these, the Family Tree-mail project, involves linking American schools with those in Europe.

Pupils in each school research their family trees and mail the information to their foreign counterparts. The information is then run through the translation software at the other end.

**Adele Dyer**

Globalink 0800 752752

## KCS in tune

● KCS has two new utilities to help Windows users. Win-Tuner does 17 tests to determine the best configuration; Win-Ini solves the problems of corrupted system files by constantly backing up latest versions. It costs £19.99, or £24.99 bundled with Win-Tuner.

KCS 01942 677777

## CD training

● ADC Education Services has released a set of training CDs covering Windows 3.1, Word 6.0, Excel 5.0 and Access 2.0. They include progress tests and training. ADC claims each is equivalent to a two-day seminar.

The CDs cost £149 each and are available on free 14-day evaluation.

ADC 0181 429 2410

# IBM offers bumper bundle to tempt diehard Dossers

IBM is bundling Stacker 4.0 disk compression with DOS 7.0, the latest version of its entry-level operating system — at less than the recommended price of Stacker 4.0 alone.

The package also includes market-leading backup software from Central Point. IBM claims DOS 7.0 leaves up to 40kb more memory free than rival MSDOS 6.2, and supports Plug & Play.

Stacker 4.0 effectively increases hard disk space by a factor of more than two, greater than the compression offered by MSDOS 6.2. The core DOS 6.0 code is identical in the IBM and Microsoft products and is owned by both companies under deals going back to the birth of the PC.

Stacker is listed at £79, though it can be bought at £20 less; DOS 7.0 is listed at £59, but again may be discounted. So why should anyone buy Stacker alone? A Stac UK spokesman said: "The only way you can use Stacker is to commit to PC DOS 7.0 and not everyone wants to do that. You can't take it apart." So why has IBM bothered to bring out a

new DOS when its new-generation 32-bit Warp operating system is doing so well — and when Microsoft is beginning to kill off DOS by making Windows 95 an operating system in its own right?

Karl Lawall, PC DOS worldwide brand manager, said many people wanted to stick to DOS and IBM's new version was the best around. "Of course, we hope users are likely to upgrade to OS/2."

Also, IBM is finally playing on a level field in the lucrative pre-load market — at least, if Microsoft honours undertakings it made in last year's anti-trust settlement, which a judge recently threw out as too lenient.

The software giant agreed to end deals under which vendors were forced to buy MSDOS with every PC, even if they then sold the machines with another operating system. Lawall said: "No longer can dealers say to me, 'I have a three-year contract with Microsoft. I have to pay Microsoft anyway. I want your DOS but, no offence, I am not buying it twice.'"

**Clive Akass**

## Disability board reaches its Zenith

*The Disability bulletin board system set up by Ken Davies has gone from strength to strength after being featured in Newsprint — and despite the theft of a Zenith portable which Ken used when visiting users or downloading data. Zenith heard of his plight through PCW and replaced his old machine with a new Z\*STAR VL80. Ken, who is disabled and sank thousands of his own money into the system, said delightedly: "My original Zenith was excellent and the new one has opened up the world again." The BBS, with help from the British Computing Society, has received more than 3,000 calls and more than 600 new users.*

**Karl Dunkerley**

Ken Davies 01594 826096; Zenith 01756 702800



Nigel Alexander of Zenith presents a new portable to Ken Davis at his Gloucester home

## Precis helps fight data overload

British Telecom has come up with a solution to information overload from print media and the Internet. Precis by Computer will scan electronic data to pick out what most interests you. This is achieved by two modules:

The information agent "learns" subjects which most interest you and prioritises a list of articles according to this

"knowledge". You give the package some information as a start and it learns from your corrections.

The text summariser picks out a number of sentences which best sum up an article's contents, using a statistical algorithm rather than grammatical or lexical analysis. Roughly speaking, nouns which are most

commonly used throughout the text are weighted according to the number of times they appear. The "summary" consists of sentences with the highest weight.

The software is still under development. The Concept Suite, from Software Scientific, has a new module which provides a similar facility.

**Adele Dyer**



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## Short Stories

## CakeWalk to a new tune

● CakeWalk Express allows you to record, edit and play back music without the use of an external MIDI instrument. The music is viewed and arranged through graphical windows while you can play along or record using Virtual Piano and the PC keyboard. It is available from Et Cetera Distribution for £69.

Et Cetera Distribution 01706 228039

## Quick on draw

● Serif has launched Draw-Plus 2.0 for an RRP of £99.95. Serif claims it has all the standalone drawing features you would expect to find in more expensive packages. It can be used with PagePlus 3.0 and is available in floppy and CD versions — the latter with 7,000 clip art images and 400 TrueType fonts.

Serif 0115 942 1502

## Handle with Caere

● Pagekeeper 2.0, an intelligent desktop manager, was launched by Caere this month. It "reads, remembers and retrieves" your files, faxes and email messages using a combination of OCR and natural language processing. Information can then be classified and recalled by carrying out a key word search.

Caere 0171 580 5434

## Hayes cut

● Hayes has slashed the price of its Smartmodem OPTIMA 14400 FAX 144 by £140 to £399 plus VAT. Bundled with Smartcom for Windows LE and Smartcom FAX for Windows LE, it supports speeds of up to 115,200bps.

Hayes 01252 775500

## Games card

● Portable Add-ons has launched a games PC card for a notebook. Costing £69 and bundled with a Quick-Shot joystick to make playing games easier, it slips into a standard PCMCIA slot.

Portable Add-ons 01483 440777

# Hewlett Packard goes for near-photo finish

Colour printers just short of photographic quality look like becoming the new norm for offices, with the launch of the latest generation of models from market leader Hewlett Packard. The range will compete against new high-quality colour printers from the likes of Epson and Tektronix (see review on page 478), but it conspicuously lacks a 1200dpi monochrome unit to match Lexmark's well-received Optra (see review on page 378).

But HP dismissed dot density as a measure of print quality. Rich Stearnes, hardcopy products marketing manager for Europe, said the International Standards Organisation had proposed a print standard with broader attributes. "Other factors are now becoming more important... when ink technology gets to the point where more ink on normal paper leads to better quality, we will be right there."

Dr Ross Allen, of HP's Palo Alto labs, said variable dot intensity was also significant. "A good fashion magazine is printed at only 150dpi but it is printed



in a continuous halftone scale. You look at the dots and you can hardly tell if it is photographic or not. The dpi is completely meaningless." The new HP models all use resolution-enhancement technology (RET) to produce

crisp edges and the DeskJets use new ColourSmart colour matching techniques. The new line-up is:

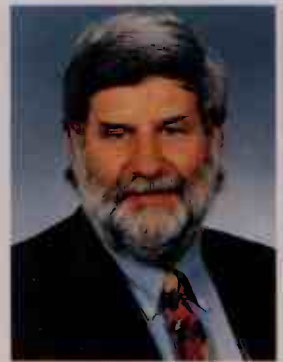
● The 600 x 300dpi DeskJet 540 and DeskWriter 540, respectively for the PC and Mac, replace the current 520 models. Recommended price is £275.

● Similarly, the DeskJet 660 and DeskWriter 660C, at £560, replace the old 560C models, and print at 600 x 600dpi mono and up to 600 x 300dpi colour.

● The £539 DeskJet 850C is completely new and uses a new pigment ink and colour enhancement (C-RET) which give four intensities per colour dot.

● The £1,150 1600C inkjet (above) for Windows and DOS, and the £1,650 1600CM for PostScript, Mac

Inkjet colour  
"better  
than  
film by  
2000"



Research at Hewlett Packard's Palo Alto labs will take inkjet and laser print quality beyond that of traditional photography by the year 2000, says HP's colour guru Dr Ross Allen (above).

"We're beginning to understand the physics of what it takes to do that: the size of the [ink] spot, how accurately it has to be placed, the edge characteristic... whether it is sharp or soft," he said at the launch of HP's new printers.

The research will lead to a growth in digital photography, though data storage will have to get cheaper and more efficient to cope with image files, Dr Ross said. The next generation of printers will be small and elegant, designed to fit into living rooms where they will be used routinely to print video images.

But Dr Allen warned that colour printers could produce problems. "Most people don't know what to do with colour yet. Colour takes much finer design sense." He said the new range's subtle shades would help document design by enabling the use of natural colours.

mixed environments, are aimed at workgroups and offer 8ppm print speed in mono, or 4ppm in colour.

● The £799 LaserJet 5P and £970 PostScript-enabled 5MP models both include infra-red ports for wireless printing, and software which provides 110 fonts in less than 2Mb disk space. **Clive Akass**

## Perils of third age of computing

We are entering the Third Age of Computing and will wreak social havoc unless we manage the transition well, says a report published last month.

The first age was that of the mainframe, the second was that of the desktop. The third moves focus from machines to the services they provide, and

from people who build the machines to the people who make most use of them.

Changes in work patterns will cause unemployment and hardship unless they are properly introduced, says the report commissioned from Spikes Cavell by PC maker Zenith Data Systems and based on

published statistics and expert interviews. ZDS MD Richard Mathewson said the idea of the report was to promote a discussion.

● The number of people working from home PCs has doubled in the past two years, says a Reed Employment survey.

ZDS 0181 568 5050



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## Short Stories

## Videologic media cards go modular

● Taking a different path from its Movie range of integrated multimedia cards, Videologic has launched a range of graphics cards for those needing a more modular approach.

The GrafixStar 300, 500 and 700 cards use the latest S3 64-bit graphics controllers and Vesa Media Channel (VMC) technology. They range in price from £115 to £275 (street £99-£240), on a par with competitive offerings.

All support 16.7 million colours at 800 x 600 or higher and are available in VL-bus and PCI flavours. Memory can be upgraded and AVI playback windows scaled up.

VMC bypasses the mother bus and acts as a data superhighway. Peripherals currently include an MPEG player, TV tuner, video inlay, frame-grabbing, clip capture and conferencing.

Videologic 01923 260511

## Buyers pay more

● PC buyers expect to pay more than they did two years ago, says an Inteco survey. They want multimedia gizmos and are prepared to spend an average of £1,540. The 486 is still the favourite chip, with 69 percent market share; the Pentium lags at nine percent.

Inteco 01483 751777

## Micro show

● Old computers never die... at least, not if you go to the Spring All Micro Show, Radio Rally and Electronics Fair on Easter Saturday, 15th April, at Bingley Hall, Staffordshire Showground, Stafford.

There will be stands for PCs, Amiga, ST, Atari 8-bit and a Sinclair Village, with a huge bring-and-buy components stand. Modern computers and other electronics will also be featured.

Details on 01473 272002.

## V.34 Hayes

● Hayes is shipping its new fast £249 28.8Kbps Accura V.34 modem

Hayes 01252 77550

# Sony and Iomega ship next-generation drives

Two products that could revolutionise disk storage are due to ship in the next few weeks after delayed launches. Sony's MD drive, originally set for launch last year, has been tipped as a successor to the floppy and is promised for next month. It takes 140Mb disks costing about £10 each, but first versions of the drive are expected to cost about £500.

Iomega's new Zip drive, originally slated for February, will be on the shelves before the end of June for just £150. It takes 100Mb disks costing about £15. The launch version is a stand-alone portable unit about the size of a modem, with parallel port or SCSI options making it suitable for both PCs and Macs.

But Srin Nageshwar, Iomega's senior vice-president for Europe, says that if the device sells as expected, the company may offer a unit designed to fit in a PC's drive bay at a cost not prohibitively greater than that of a floppy drive. Both of the drives signal the emergence of removable



Zip files in the Iomega drive

random-access mass storage costing much less per megabyte than 1.44Mb floppies. The drives may not oust the floppy, which has ample capacity for text and small program files, but they will answer a growing demand for cheap ways of storing and transporting large multimedia files.

Prices of read-write CD drives are unlikely to reach consumer level in the short term. High-end storage market leader Syquest appears to have no immediate plans for a Zip-like product. But Pierre Esneau, Euromarketing director, said: "We are looking at every niche." He said he did not believe the Zip would affect Syquest's core market in publishing houses.

Iomega is licensing third-party manufacturers to produce both Zip drives and disks. "We are aware that people don't like

to feel they are tied to one supplier," Nageshwar said. He was cagey about the specifications but said using a Zip was much like using a hard disk; data access rates are "between 20 and 30ms".

The Zip is pitched at the mass market and comes with easy-to-use software that laudably avoids jargon words. Nageshwar's attempts to avoid computerspeak are not always successful, however. "We are trying to create a new category here called Personal Storage Solutions," he said. "We are not selling disk drives. We are not selling storage [in the sense of marketing a backup device]. So we are hoping that the last thing people will refer to the Zip as is a 100Mb drive."

You can use 100Mb disks in your Personal Storage Solution. You can run programs from them; you can store files on them. But the Zip is not a drive, like your floppy and hard drives. Clear enough, isn't it? **Clive Akass**  
Iomega 0800 898563; Sony 0932 816000  
Syquest 01264 362266

## Bentley rolls its own market

A world-leading CAD specialist has taken responsibility for its own sales and marketing — because few people have heard of it. Bentley, founded by US brothers Keith and Barry Bentley in 1984, developed the high-end multiplatform MicroStation family (right) which has a claimed 170,000 users. But the product has been associated with Intergraph, which had exclusive marketing rights.

"Bentley has had little acknowledgement worldwide as a software developer," said European MD Scott Venlet. The company also announced the shipping of its new MicroStation Modeller three-dimensional



modeller for a variety of platforms including Windows, NT, Solaris, RS/6000 and Silicon Graphics. The recommended price is £1,500.

Bentley 01344 412233



# Low-power chip for high-power Apples

The latest of the PowerPC 603 processor range should usher in a new generation of powerful portables. The 32-bit 603e is clocked at 100MHz and draws just 3W from a 3.3v supply.

Also announced last month was the PowerPC 602 chip, designed for entry-level machines, and

Apple has begun shipping competitively priced PowerMacs with a PC board which lets you keep using Windows software while moving on to PowerPC applications.

The card has a 66MHz DX2 processor which can share resources such as a CD and sound card.

Prices start at £1,910 for a PowerMac 6100/60 with a 14in colour display, 8Mb RAM, and the card, which costs £470 by itself.

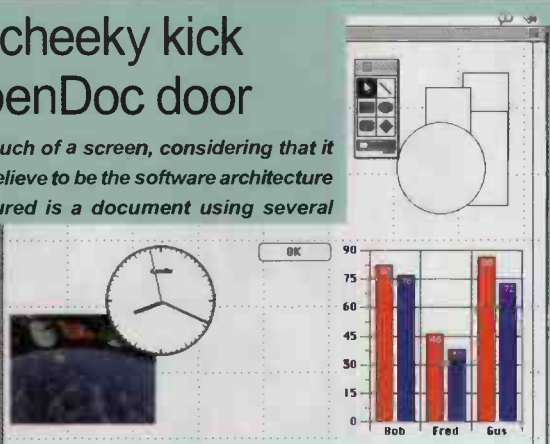
Apple hopes the twin-platform machine will open up a new market for PowerMacs among PC owners with a big investment in Windows software. You can switch platforms by means of a simple hotkey and the two processors even share an AppleTalk link. Keith

## Taking a cheeky kick at the OpenDoc door

*This doesn't look much of a screen, considering that it shows what many believe to be the software architecture of the future. Featured is a document using several*

*types of screen object: text, chart drawing, picture and clock. This being Open Doc, you take a dedicated mini-app to the document*

*for each task and say goodbye to massive, memory-hogging application suites. It was demonstrated at the Windows 95 show, where Apple turned up cheekily to show that it was doing things every bit as interesting as the Microsoft. Novell is beta-testing a Windows version of Open Doc. Clive Akass*



consumer products. And there are whispers of a whole raft of new PowerMacs coming on line this summer (see Hands On Macintosh, page 645). In a further challenge to Microsoft's market domination,

Gould, who is Apple's entry-level desktop systems manager, said: "Effectively, customers are getting two computers for the price of one."

For details, dial 100 and ask for Freefone Apple

### Top 10 Windows and DOS

| Product                 | Manufacturer | Last month |
|-------------------------|--------------|------------|
| 1 MS Office Pro         | Microsoft    | -          |
| 2 First Aid for Windows | RMG          | -          |
| 3 MS Office 4.2 U/G     | Microsoft    | 5          |
| 4 Cleansweep            | Quarterdeck  | 4          |
| 5 QEMM 386              | Quarterdeck  | 2          |
| 6 MS Encarta            | Microsoft    | 1          |
| 7 MS Works              | Microsoft    | 8          |
| 8 Corel Gallery         | Corel        | 3          |
| 9 MS DOS 6.22           | Microsoft    | 9          |
| 10 Perfect Office       | Novell       | -          |

### Top 10 DOS

|                         |             |   |
|-------------------------|-------------|---|
| 1 QEMM 7.5              | Quarterdeck | 1 |
| 2 DOS 6.22              | Microsoft   | 2 |
| 3 Stacker & QEMM        | Stac        | - |
| 4 OS/2 Warp 3.0         | IBM         | 4 |
| 5 MS Flight Simulator   | Microsoft   | 3 |
| 6 Turbo C++ 3.0         | Borland     | 8 |
| 7 Pegasus Solo Accounts | Pegasus     | - |
| 8 Dr Solomon's 1/4ly    | S & S       | - |
| 9 pcAnywhere            | Symantec    | 7 |
| 10 Norton Utilities     | Symantec    | - |

### Top 20 Windows

| Product                 | Manufacturer | Last month |
|-------------------------|--------------|------------|
| 1 MS Office Pro         | Microsoft    | -          |
| 2 First Aid for Windows | RMG          | -          |
| 3 MS Office 4.2 U/G     | Microsoft    | 5          |
| 4 Cleansweep            | Quarterdeck  | 4          |
| 5 MS Encarta            | Microsoft    | 1          |
| 6 MS Works              | Microsoft    | 8          |
| 7 Corel Gallery         | Corel        | 3          |
| 8 PerfectOffice         | Novell       | -          |
| 9 WordStar 2.0          | Softkey      | 6          |
| 10 CorelDraw 3.0 CD     | Corel        | 13         |
| 11 Lotus SmartSuite     | Lotus        | 11         |
| 12 Family Tree Maker    | RMG          | 12         |
| 13 Quicken 3.0          | Intuit       | 10         |
| 14 Quicken Home Pack    | Intuit       | 16         |
| 15 Shapeware v3         | Visio        | -          |
| 16 Labels Unlimited     | Softkey      | 19         |
| 17 QuickBooks           | Intuit       | 14         |
| 18 WordPerfect 6.1      | Novell       | 17         |
| 19 WinFax Pro           | DeIrina      | -          |
| 20 FileMaker Pro        | Claris       | -          |

Figures, supplied by Software Warehouse, relate to bestsellers for February 1995

## Short Stories

### Apple pays up in RSI claim

● Apple has settled a claim by a woman who said she suffered repetitive strain injury (RSI) from working at Macs. School secretary Nancy Urbanski has also filed a suit against IBM for alleged hand and wrist injuries.

Apple says it paid an undisclosed sum because of procedural errors by hired lawyers, implying that the company does not accept liability for keyboard strain.

The case is only the second RSI claim to reach a conclusion out of hundreds pending in US courts; the first, last year, was decided in favour of Compaq.

### Share wares

● Apple is offering Windows versions of its AppleShare software to allow PCs to connect to Macs on AppleTalk local networks. AppleShare Client for Windows will be bundled free with Apple's workgroup servers, or AppleShare users can upgrade for £63. Otherwise it costs £200 from Apple dealers.

Apple is also bundling a Windows client version of its AppleSearch 1.5 text retrieval software with the latest free upgrade. Fax your details and a copy of the first page of the manual to 0181 730 2270.

### Pippin nips in

● Apple this month demonstrated its new CD player, Pippin. The Japanese toy maker Bandai will market it under the name Power Player. Bandai hopes that Pippin, priced at about \$500 and with its sights set firmly at the home market, will make CD-ROM players as popular as VCRs and audio CDs.

Apple 0181 569 1199

## Newsprint feedback

Email your news and views to [clive\\_akass@pcw.ccmil.compuuserve.com](mailto:clive_akass@pcw.ccmil.compuuserve.com). We are also interested in good screenshots or other pictures. Any email will be considered for publication unless you request otherwise.



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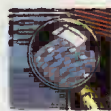
64-Bit TriFlex/PCI architecture. Originally designed for multi-processing servers to achieve the ultimate performance from a 586-class processor—



ProSignia 300



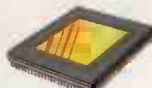
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\*Price correct at time of going to press and excludes VAT at 17.5%. Configuration — ProSignia 300 5/75 Model 1050, 75MHz Pentium Processor, 16 MB ECC RAM, 1.05 GB Fast-SCSI-2 hard drive, Ethernet network interface, CD-ROM and SmartStart. Product names mentioned herein may be trademarks and/or registered trademarks of other companies.



## Banking on others' misfortune

By 1997, Compaq intends to have a quarter of the PC market share. On paper, certainly, the prospects look good, but is it safe to rely so heavily on the small-scale vendors going belly up?

**B**y 1997 we expect to have 25 percent of the market, maybe even more," said David Moore, Compaq's desktop product manager, at the launch of its new DeskPro and ProLinea product ranges. Bullish, even aggressive talk from a company which, while it currently leads the market in the UK, still has less than half that magic figure.

Moore's contention is based on the premise that many of the other players in the market are currently trading at a loss. He cites AST as one example: "A year ago we would have seen AST as a serious competitor, but AST's inability to deliver its new range of machines and very poor margins meant it was losing money." A couple of months ago AST was forced to sell more than 40 percent of its stock to Samsung.

Yet whether or not you believe Moore, there's little doubt that on paper at least, Compaq is on a roll. Between 1993 and 1994 its UK PC sales grew by 45 percent. For years it has battled with IBM for the position of the UK's number one PC vendor, but recent figures from Dataquest suggest it has now

opened up a gap of 3.7 percent market share over its arch rival. Compaq's high-volume manufacturing also means it is

one of the few PC manufacturers still making reasonable margins on PC sales. Its PC assembly plant in Erskine, Scotland is expected to produce 2.5 million PCs in 1995 for the UK and Europe.

Compaq is also able to leverage its R&D facilities to keep a technology lead. A high level of motherboard integration keeps production costs down, and custom chipsets like its Triflex PCI

can give it a performance advantage. To woo corporate customers, Compaq is able to produce figures from the Gartner Group which demonstrate that the purchase cost of a PC is now only 12 percent of the total cost of ownership. The other costs — training, inventory tracking of hardware and software, software audits and updates, support, downtime and data loss — form the other 88 percent. This puts the price differential between Compaq kit and cheap clone kit into perspective.

So, Compaq has a strong market share and it has the technology, but will it be able to deliver on its ambitious plans to increase market share? James Blackledge, international marketing director at Apricot, was unimpressed by its market share claims. "Anybody can make claims; claims are two a penny," he said. "Yes, Compaq does have a snowball in hell's chance of achieving that target, but that would involve a lot of no-name brands, who currently have 30-35 percent of the market, going out of business." Blackledge also questioned whether Compaq will be able to maintain its market share lead over IBM. IBM, he explained, needs to be seen as Compaq's big rival and is perfectly capable of using aggressive pricing to claw back market share from Compaq.

Of course, Compaq will claim that the price/performance of the new ProLinea machines and the fistful of Intelligent Manageability features added to its new DeskPros give it an edge. These features cover three main areas: asset control, fault management and security management. Asset control allows detailed information about a workstation's configuration, serial number, software drivers and so on to be gathered across a network. Fault management covers features like the recently announced Intellisafe Hard Disk Technology, a superset of Enhanced IDE designed to predict hard disk failures before they happen, as well as what

Compaq calls Environmental Fault Prevention Tracking. This is a hardware and software combination which monitors the temperature of a PC and warns of problems if, for example, a user accidentally obstructs a PC's fan.

Compaq has also worked hard on making its new PCs easier to service. Motherboards can be changed in a matter of minutes without the use of any tools and drive bays are hinged for easy access. Security management features include extensive control over floppy disk drives. For example, you can disable the write capability of a floppy drive to prevent people stealing data.

Compaq has also used its clout as a major PC vendor to start the Compaq Desktop Management Solutions Partners' Program (DMSPP). This newly spawned acronym, as if we needed another one, is intended to ensure compatibility and integration of Intelligent Manageability with the leading LAN management vendors. So far the list includes Cheyenne Software, Intel Corporation, Microsoft Corporation, Novell, Saber Software and Symantec.

Yet Intelligent Manageability, DMSPP and ease of servicing will probably only offer Compaq a short-lived edge over competitors, and in other respects the company is just playing catch-up with its latest launch. For example, until now it has not had a Pentium machine in its ProLinea range, priced to compete with the likes of Dell and Gateway. Some people also argue that Intelligent Manageability is an essentially proprietary system which in any case offers little more than the DMI (Desktop Management Interface) that other vendors plan to adopt. No, as Blackledge said, if Compaq is to achieve anything like 25 percent market share in 1997 it needs a lot of small-scale vendors to go out of business: the small vendors who, trading on minuscule margins, are hanging on to their third of the market a lot more tenaciously than Compaq gives them credit for.

**Ben Tisdall**



*Intelligent Manageability and easy servicing should give Compaq's new DeskPros the edge, but in some respects Compaq is still playing catch-up*

ANALYSIS



Last January I twice trekked to Mecca (Microsoft) for briefings on various aspects of Windows 95 and NT. During my first visit I heard all about NT and Microsoft's desire to gain a greater foothold in high-end corporate computing.

During my second visit I spent two days looking at Windows 95 and Microsoft's multimedia hooks for this new version of its popular operating system. While corporate computing is important to Microsoft's future, its multimedia strategy is perhaps its top priority these days, and it is taking great pains to ensure that Windows 95 becomes the richest multimedia environment on the market.

One of the most exciting new products is Enhanced CD or CD+. A new CD-ROM format, it works with multisession CD-ROM drives which now make up about 60 percent of the CD-ROMs shipped today.

What it does is add a second track to current CD-ROMs. The first track handles music, the second is for data. This new format is especially important for the music industry, and Microsoft wants to entice the entire music world to support Enhanced CD so that it will use the CD-ROM format on a PC not only for music, but for video and merchandising as well.

Microsoft is hoping the MTV generation will start to think of the PC as a hi-fi, particularly since record labels could include the videos of the songs on CDs, and add pictures of various related accessories such as T-shirts, mugs, posters etc. Using a modem and an 800 number, kids could dial up some type of merchandising house and order these items using their (or their parents') credit cards.

Sony is Microsoft's major partner in this venture, and together with Philips it will add CD+ to its HDCD (high-density compact disc) specification this year. More importantly, about 85 percent of the music industry has vowed to support Enhanced CD, which more or less guarantees that MTV will come to the

PC sometime in the near future.

Indeed, the teenager looks set to become Microsoft's main target for multimedia PCs. It thinks that eventually, all teenagers will want a PC in their bedroom, not only for work, games, and music (as above) but as a kind of all-in-one digital access device. It could act as a PC, TV, phone, and maybe even incorporate a videophone, when the technology arrives.

It could also be made to handle video. Of course, this will need to be sent over standard twisted-pair phone lines if it's going to have any serious consumer impact, but Creative Labs — never known to be slow on the uptake — is already working towards this with its Sharevision product. This is a two-board twisted-pair solution which comes with a video camera and sells for about \$1,500. Although it cannot compete with high-end video-conferencing products, it does give the user about 10 to 12 frames per second of real-time two-way video for use in this type of conferencing application.

The business world, indeed, is very interested in shared white boards and real-time applications, with the video component taking a back seat to these applications at the peer-to-peer level. Ironically, though, it would be easier to create a videophone for the PC than as a small standalone device.

In fact, you can turn a

## Getting it all together

PC into a videophone simply by adding Sharevision. The current \$1,500 charge for doing so is a little steep, but if Creative can get this down to around \$650 it could suddenly become an option for a great many people. Also, Creative could set up personal conferencing centres inside its operations throughout the US, and let people come in and use them for a fraction of what AT&T currently charges for a video-conferencing session over ISDN or T1 lines.

The all-in-one multimedia computer with PC, TV, telephone, CD-ROM, music/video and videophone could well be on the market by 1996. All the technology exists today — it just needs to be tweaked, and realistically priced.

**Tim Bajarin**

The next stage of the multimedia revolution is on the horizon. If companies such as Microsoft and Creative Labs maintain their current efforts, the affordable all-in-one PC/TV/CD/phone could be a reality within only a year.

*Videophones and other combo products could be on every desk next year*



### Caught in the Net — Special Offer

Erstwhile Hands On columnist Dan O'Brien has swapped his motherboards for the boards of the theatre and agreed to share the benefits of his new-found fame with readers of PCW. Under the motto "The geek shall inherit the earth", and with help from Pipex, FTP software and Toshiba, Dan's one-man-and-several-computers show looks at why the Internet is like being a Goth and how computers can improve your sex life. It has been on tour to Cambridge (where Dan fell off the stage and broke his leg), London and the Edinburgh Fringe, and is now back in London at The Arts Theatre, Great Newport Street, London WC2. The nearest tube is Tottenham Court Road. PCW readers can save £2.50 on the Sunday 9th April performance by calling the Box Office on 0171 836 2132. Just call and say that you read about the show in PCW, and you'll be able to buy tickets for £5 instead of £7.50.

SPECIAL ANALYSIS



## Take VAT and party

PC vendors are in the fortunate situation of being able to advertise prices ex-VAT; not so in the home market, where buyers are used to seeing an all-inclusive price tag. Perhaps the TV-PC will iron out these double standards.

**B**uy a new cooker and you'd be astonished if the salesperson added £100 to the price for VAT. But today, millions of people buying PCs for home use have the VAT added, instead of seeing the real price headlined. This will have to change if the TV-PC ever takes off.

So far, we've suffered the use of double standards. Home computers like the Sinclair Spectrum and Commodore 64 were clearly being bought by individuals and therefore the prices included VAT. If the eye-catching sticker said £199.99, you knew there wouldn't be a real price of £234.99 in the small print. Meanwhile, PC compatibles were bought mainly by companies who, while they still had to pay VAT, could claim it back. If the eye-catching sticker said £1,999.99 they expected to pay £2,349.99, while appreciating that this wasn't the "real" cost to the company.



*ICL could break the deadlock with the move from PC-TV to the TV-PC, indisputably a home machine and therefore subject to VAT*

But now the consumer market is driving the PC industry, is the double standard justifiable? Last year, America's top personal computer suppliers were Compaq, Apple and Packard-Bell, all of whom targeted home buyers. IBM slipped to fourth place partly because it didn't ship enough of its consumer range, the Aptiva, quickly enough, and partly because it took back some unsold stocks of business PCs. The world's largest direct suppliers, Dell and Gateway 2000, also sell PCs

direct to knowledgeable home users who, in earlier years, would have bought Acorn BBC micros or Commodore Amigas. How many of them will actually be able to claim back the VAT?

Under the circumstances, it may well be that quoted prices should be VAT-inclusive. It would certainly be more honest if the sticker price read £1,174.99 while the small print told business buyers that, after claiming VAT, they'd only be paying £999.99. However, nothing short of official intervention will persuade firms to "increase" their prices by 17.5 percent because the first ones to do so will lose sales. Unless everyone does it, no-one can afford to.

This problem is not going to go away. Indeed, it could come to a head with the arrival of the TV-PC, which will surely follow on from the PC-TV. Either or both should form the basis of the next boom market.

The story of the personal computer industry shows something Darwin would have recognised as "speciation". As the market grows, it provides niches capable of sustaining new species of PC, which are variations descended from earlier generations. For example, from desktops we got luggables, then portables and notebook PCs, and then other small machines. Loading desktop PCs with extra drives etc. started the trend that produced file servers with their multiple processors and advanced buses. These now bear no physical resemblance to ultra-notebooks with PCMCIA slots, but "genetically" — as the computer equivalent of a Darwin would recognise — they have a huge amount in common.

The growth of the home market promises to open up a profitable new niche for machines that combine the facilities of PCs and TVs, radios, answering machines, CD and VideoCD players, video editing systems and goodness knows what else. A number of PC suppliers have dabbled in these areas, including Acer, Olivetti, Packard-Bell and Compaq. ICL has targeted it

with a one-box PC-TV with a built-in Nicam stereo TV set, which should reach the high street around the end of April.

Part of the appeal of such systems is that they are integrated and easy to use. Even people who might venture into the hi-fi separates market are wary of trying to add sound cards, TV tuners and CD-ROM drives to PCs: the installation is just too much trouble. But the real challenge will come when trying to take the step from the PC-TV to the TV-PC, which will be a true "consumer durable".

It's all very well to fit a White Book-compatible CD-ROM drive and MPEG card capable of playing VideoCD discs, and a card that will put television in an on-screen window, but you still have a single-user PC with a keyboard that is best used in a separate room or study. The TV-PC, by contrast, will have to be something the family can gather round. It will have to look at home in the living room and it will need to be operated by some sort of infra-red remote controller. Unlike the PC-TV, then, the TV-PC will probably be constructed by putting a PC card inside a TV set.

"Probably" but not "certainly". The familiar Wintel machine is not the only system angling for tomorrow's TV-PC market. The winning design might instead be descended from the sort of set-top convertor now being developed to connect TV sets with phone lines and cable TV networks. Notwithstanding the power of the Wintel standard, the first UK trials are being done with set-top boxes based on the Apple Mac (in BT's Video On Demand experiments) and Acorn Archimedes (in Cambridge). Other competitors are based on Philips CD-i or forthcoming games consoles.

The one thing we can be sure of is that when the TV-PC takes its place in the consumer goods arena, no-one will be able to pretend it is a business purchase and the price will have to include VAT.

**Jack Schofield**



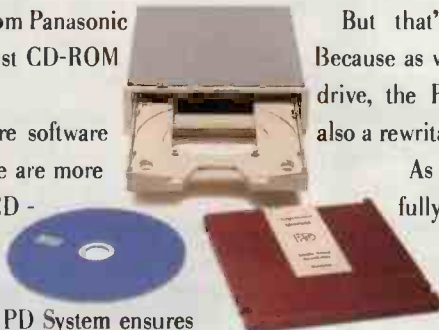
# The new 4x speed CD-ROM drive. (Continued overleaf.)



The new PD System from Panasonic gives you one of the fastest CD-ROM drives available.

And as more and more software is distributed on CD, there are more and more reasons why a CD-ROM drive is essential.

Reading CDs at four times standard speed, the PD System ensures you get the full benefit from the increasing choice of multimedia software - with video, sound, graphics and animation.



But that's only half the story. Because as well as being a CD-ROM drive, the Panasonic PD System is also a rewritable optical disk drive.

As well as CD-ROMs, the fully motorised loading tray is designed to accept rewritable optical disks too. Offering a massive 650MB of memory, these optical disks can be written to and rewritten as many times as you like.

And because the disks are removable, large amounts of data can be stored without filling up your hard disk.

So for little more than the price of a CD-ROM drive, the new Panasonic PD System gives you the best of both worlds, in one piece of half-height hardware.



**Panasonic**  
Optical Storage



# The new low cost 650MB optical disk drive. (Continued overleaf.)

The new PD System from Panasonic is more than an optical disk drive. But for less than the cost of an optical disk drive.

And as demand grows for more and more storage capacity, there are more and more reasons why this kind of drive is essential.

Loading an optical disk into the PD System provides a massive 650MB of memory that you can write to and re-write as many times as you like. You can directly overwrite each sector,

each file or the entire 650MB disk in one pass.

The disks are not only high performance and user friendly, but also removable, so large amounts of data can be stored without filling up your hard disk.

But that's only half the story. Because as well as being an optical disk drive, the PD System is also a 4x speed CD-ROM drive.

As well as optical disks, the fully motorised loading tray also accepts CD-ROM disks, which

the PD System reads at four times standard speed. So you get the full benefit from the increasing choice of multimedia software - with video, sound, graphics and animation.

In fact, for less than the price of an optical disk drive, the new Panasonic PD System gives you the best of both worlds, in one piece of half-height hardware.



**Panasonic**  
Optical Storage



A couple of weeks ago I logged on to CompuServe to find that annoyingly, I'd received a piece of anonymous, unsolicited email over the Internet. I say annoyingly because, as other CIS members will no doubt be aware, external mail incurs a cost of \$0.10 per message. It's like a double-glazing salesman phoning up and reversing the charges, or getting billed by the Jehovah's Witnesses for being doorstepped.

Anyway, the gist of the message is, lucky me, unbelievable wealth is but a few days away. All I have to do is maintain the chain and send the letter on to six other people. Examples are given of those who did, and who subsequently acquired sums of money which would probably be enough to bail out Barings. But there is a caveat: should I break the chain, the outlook for my health and future happiness will be decidedly dodgy. Instances are cited of unfortunates who did just that. We're talking 70mph head-on collisions into lorries, sudden wasting diseases, and being unexpectedly eaten by shoals of carnivorous fish.

Well, sod that, I thought, and deleted the email from my in-tray. That's me: fearless in the face of potential danger. But that wasn't really enough for a true tempter of fate. How could I tempt it further?

It occurred to me that a few months back, someone had autojoined me to the bikers' conference on CIX. This meant I incurred a lengthy and expensive download. In irritated response, therefore, I mentioned in passing that all bikers were sub-moronic leather-clad poofers who couldn't hold more than half a pint of Kaliber shandy between them without collapsing legless under the table, and so on. Furthermore, I said I could take all of them on with both hands tied behind my back. I also threatened, as an aside, to rip their bikes apart and stick bits of them up bodily orifices (although which bits, and which orifices, I didn't specify).

The responses were rapid in coming and somewhat varied. It was possible, however, to detect a common leitmotif throughout, along the lines of: "Watch your back. You're dead meat."

Surely this was too good an opportunity to miss. Having refused to pass on the email, I could now test the efficacy of its curse. It just so happened that there was a bikers' meeting last Friday evening at my local, The Greyhound. I therefore let it be known that I'd be coming round to kick their heads in.

Why is it, anyway, that bikers are always perceived as being so damned "hard"? Why not other vehicle drivers? Milk-float drivers, for example? Then again, maybe within their peer groups they are. Maybe they descend on seaside towns *en masse* and have running battles with electric golf-caddie drivers. It's just that this sort of thing doesn't warrant the same media hype as motorcyclists vs scooter riders do.

Whatever, I turned up at the pub around 9pm, looking for trouble. Unfortunately, there was none to be found. As expected, the leather-clad bikers were all in a corner, by this time numbed by their low-alcohol shandies. The "men", incidentally, were on halves, while their womenfolk were drinking pints of strong lager. Which says it all, really. It wasn't even worth verbally attacking them. Disappointed, I skulked out in search of some genuinely dangerous opportunities.

There's a grimy little kebab house just round the corner, staffed by a Typhoid Mary-lookalike wearing grubby overalls. (No, I'm not going to say that the area is notable for its absence of dogs and cats. I would observe, however, that the local fox population has recently gone into decline.) I went in, ordered something that looked vaguely lambish, ate it, and sat back to await results. Nothing. Not even a belch.

Things were getting desperate. We've got a local paper which has a lively readers' letters section. Normally, everyone's quite respectful to one another. However, the one thing usually guaranteed to get people going is any criticism of dogs. Apparently, if you write in and say they should be muzzled and neutered you often get packages of dog excrement by return of post. So, I sent in a letter praising the attitude of the South Koreans towards dogs, and concluded by enclosing my own favourite dog recipes such as corgi kebabs. But to date, except for an acknowledgement of receipt from the editor, I've had no comeback whatsoever.



Michael Hewitt

# off Sounding

On to the ultimate challenge, then. If this didn't bring me bad luck, nothing would. I loaded a WordPerfect 6.0 beta, Excel and Q&A onto my hard disk. Then I opened them all simultaneously, and tried to get them to exchange data with one another. But they did. Not a single crash or DLL error message.

To Hell with it then. Unless this column is lined in black and prefaced with a message from Ben Tisdall to the effect that I've recently fallen under a truck, you can assume that chain e-letters, especially those bearing curses, are nonsense. The thing is, however, there are quite a few impressionable people around who can be genuinely upset by this nonsense — *vide* chain letters of the snail mail variety. So, if you get one, try reporting it to the system administrator. Eventually, maybe, the online world will be free of such garbage once and for all.

PCW

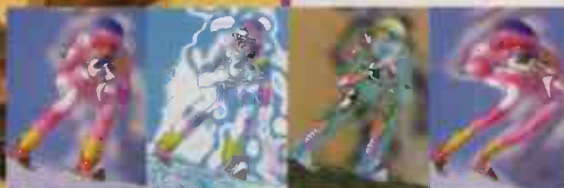


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A press release has just informed me that with 65 million users worldwide, Microsoft Windows has outsold the world's best-selling album of all time, Michael Jackson's *Thriller*, sales of which currently stand at 40 million. This is a classic manifestation of the pointlessly irrelevant statistic syndrome so dear to the IT press and public relations industries. And while we're on the subject, I would like to point out that IBM has shifted more copies of *Warp* since its launch last year than the band Love has of its seminal album, *Forever Changes*. This is despite the latter having a 26-year start, and being available on vinyl, tape and compact disc.

Well, I was going to waffle on a bit more in this vein in the hope of filling the whole page, pointing out that more people still use Amstrad PCWs than have heard of Ivor Cutler, there are more Apple Macs than the annual UK consumption of apples, and if all the PCs in the world were thrown out of the window at the same time, the ensuing tidal wave would engulf many major coastal cities.

The advantage is you can make it up as you go along. Although I believe the first two statements in this column are true, it doesn't really matter as nobody gives a damn anyway.

This, however, is a private matter between the hacks and the flacks. It's a traditional and fine sport for the former to take the pointlessly irrelevant statistic syndrome — usually known by its initials — out of the latter. What puzzles me is what the rest of the world makes of it. The associated condition, ludicrous metaphorical dysphoria, is often seen in advertisements in magazines like this one. My personal favourite has a photo of this bloke sitting at an untidy desk, looking rather stressed. The next picture compares this with the woes of a crowded computer screen. In the final frame he's happy as Larry, has his suit jacket back on and has bought himself some hardware to spread his Windows desktop over two monitors.

Look guys, "desktop" is just a metaphor. Life isn't really like that and the analogy doesn't bear being taken very far. Do you cover your real desktop with wallpaper? Does your desk run out of some ethereal "resources" before it runs out of real space? Do your piles of books, paperwork, phones, pens and coffee mugs dissolve into pleasant swirling patterns if you don't touch them for five minutes? If so, please send me some of whatever medication you are taking.

Now, these devices may be very useful in their own right, but as far as sheer space is concerned, more is not tidier. From personal experience, hav-

ing doubled my real-world desktop to three square metres, I can honestly say it's never been messier although I must admit there's a considerable trade-off in terms of free floor area. But, fair enough, this was an ad in the computer press. We're all consenting adults as far as this is concerned, and we understand what all this silliness is trying to convey.

Even more worrying are the huge advertisements that regale readers of the mainstream daily papers. Formerly, computer adverts were limited to eighth-of-a-page boxes with an amateur layout that everyone could safely ignore. Now the two-page "lifestyle" ad greets the reader. Explain, in 100 words or fewer please, to your Aunt Agatha, why being "Warped" is promoted as a Good Thing. "What, dear — do you mean 'warped' like that drawer that won't shut properly, or 'warped' like that poor vicar who got sent away?" The one that really, really gets up my nose is "Where do you want to go today?". This, though making perfect sense coming from one's chauffeur, takes on a surreal mantle of irrelevance from a software company.

My gut reaction to this piece of cringingly twee nonsense is: "Mind your own damned business." Second reaction is to enquire sarcastically whether the company has acquired a personal transport business. Third is to wonder what on earth could constitute an intelligent answer to this question. "I'd like to trip lightly amongst the cells of my spreadsheet, admiring the wild flowers, followed by a light



Tim Nott

# Homefront

lunch at the database, and then point my word processor at the motorway and floor the loud pedal." Possibly, though, this is a teaser to soften us up for the Microsoft Network. In which case the correct answer is, presumably: "I'd like to stay right here and bloat my phone bill by looking at some low-resolution bitmaps of faraway places."

Looking at the very small print in this advert, "Where do you want to go today?", formerly an unremarkable English sentence, available for general use by public carriers, drivers and people on holiday, is now claimed as a trademark of the Microsoft Corporation. "The mind boggles" is a trademark of the Timothy Nott Cliché Corporation.

PCW



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**T**he music industry regards home copying, even of one's own CDs, as a heinous crime. But the computer industry regards home copying as a right and a necessity. The software companies advise us to make safety copies of programs as well as data. They know that some dishonest people will pass copies on to friends, and they fight this by upgrading their software as often as possible.

The downside, of course, is that we are continually being brainwashed into buying new versions of software that's already working perfectly well. Often the new versions cause problems never encountered with the earlier versions.

Delrina's Far Side screensaver should make a nice upgrade to Opus 'n Bill because it uses the same Intermission Engine. Far Side requires 3Mb RAM. But when I loaded it on a 4Mb machine I got the error message "Object load error — out of memory", even though Opus still worked fine.

Hewlett Packard is now selling an upgrade kit for the Colorado Trakker tape backup system. This lets the drive use a longer tape, to store more data.

Version 3.06 was working fine, but "successfully" installing the upgrade versions 4.03 and 4.06 killed it stone dead, with the error message "Error 194 — unable to detect tape controller at given I/O address".

Hewlett Packard seemed surprised, tried everything, and three weeks later had still not come up with an answer. That was mid-February. If you have bought a copy since then and hit problems, you should know that HP already knew about them.

HP's LaserJet 4L printers come with fancy new Explorer software that lets the PC control the page setup even when the word processor cannot drive it. But the printer still prints pound signs as hash signs unless you know the secret. This is to load an HP utility called HPtrans into memory.

HP also fails to warn users of another work-spoiling pitfall. Whereas previous HP printers had non-volatile memory to store essential settings such as page length, the 4L has only volatile memory. So if you switch off the 4L at the mains all the settings revert to factory defaults, not user defaults. I have suggested that HP lets users into the secret, by putting it in the manual.

The latest version of Quarterdeck's QEMM memory manager can make you sit for several hours while it ploughs through at least five trillion (US) combinations. At the end it throws up the

user-scaring "WARNING" message, "Add the SH:N parameter to your QEMM386.SYS command line", without any advice on how to do it or why.

I had told Quarterdeck about this over a year ago and written about it (see last February's PCW) but no-one ever bothered to fix it.

Symantec's Q&A database upgrade from DOS to Windows has of course already become a legend for its messiness. Delrina's WinFax, like Microsoft's Word, is now so top-heavy with features that I would rather have the disk space back than the world's largest collection of fax cover sheets.

Uninstaller version 2.0 is supposed to help people remove unwanted files, even from Windows. When I was reviewing Uninstaller it repeatedly crashed out of Windows when killing off stray orphans. I twice phoned MicroHelp's distributor in the UK and asked whether it is a known bug. I never heard anything back, even after the review raised the point in print.

Sigma pioneered MPEG video with the ReelMagic card. Now it is called the RealMagic. Any version up to 2.0 I would install itself in a directory called Reelmagic. Upgrade version 2.2 creates and installs itself into a new directory called Realmagic, without warning and without getting rid of the old autoexec and config instructions. This means the PC ends up trying to load the whole caboodle twice over while grabbing a new set of IRQ and DMA settings. The result is a pig's ear that no longer works.

The trick, says Sigma, is to uninstall version 2.01 and delete all its files before installing version 2.2. Does anyone know of any other serious software that requires this kind of action and skill from the user?

It gets worse. A full year ago, when I ran into problems with earlier ReelMagic upgrades, Sigma assured me that all versions sold to the public had been fixed and did not require users to uninstall before upgrading.

When I upgraded to Windows 3.11, I noticed something odd. I had lost two



**Barry Fox**

# Talking Straight

free utilities that Windows 3.1 users usually only find out about because someone tells them. MSD, which works like Norton or Checkit Pro to analyse the host PC, no longer worked. And Dr Watson, which monitors performance and logs errors, was missing.

So I asked Microsoft what happened. Was there a known bug in new MSD and had Dr Watson been removed? I asked. And asked. After three months I'd still got no answer. I've seen Microsoft work this way before. Just pass questions round in a circle until they get lost.

So okay, you win. I am no longer going to waste time trying to squeeze answers from software companies who, despite knowing that their products are faulty, are quite happy to go on advertising and selling them. Instead, I shall ask them the question and then, if there is no clear and constructive answer, lodge a complaint with the Advertising Standards Authority and/or Office of Fair Trading. Let's see how that works.

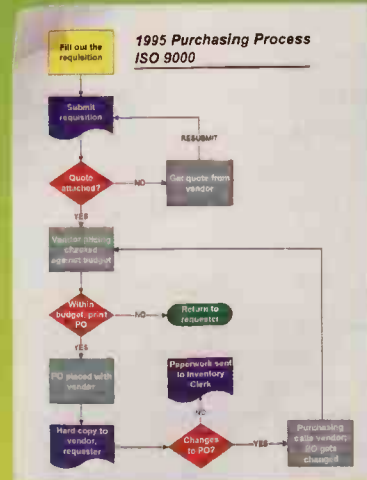
**PCW**





(Sort through a fifty page plan to get to the point.)

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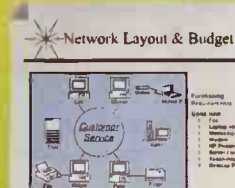
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**T**he HCI Medical Centre in Clydebank, Scotland, has a new owner. Following negotiations with the receivers, the Abu Dhabi Investment Company has taken over the facility with a view to running it as an international centre of medical excellence along similar lines to those conceived originally by the founders. Regular readers will know that HCI is an advanced health care facility on the banks of the Clyde near Glasgow. The hospital focuses on the provision of tertiary care for patients who have difficulty in obtaining advanced levels of treatment at home. A crisis of confidence during October was followed by the receivers being called in, in November last year.

After three months of uncertainty, staff at HCI were all very relieved to know that the place once again has a bright future. We can now truly focus on the business at hand, rather than the distractions of receivership. There are many of these. A substantial change in management, inevitable following a new ownership, leads to a period of time during which working practices need to be redressed, things not attended to during the financial strictures of the receivership attended to. One such piece of business, which I began to describe last month, was the distraction of woodwork.

Last month I wrote about the problems of communicating a simple pair of files from California to PCW. After much scrabbling around with various versions of word processors running under a variety of operating systems, I had managed to mail the copy to the UK only to find that the Internet mail gateway was down. How come? The gateway was suffering a symptom of a world-wide (web?) disorder which is likely to afflict most companies' systems over forthcoming years, if not months. The problem is rooted in the awesome amount of data that exists in the world. A connection to the Internet, even just through a mail gateway, is similar to trying to take a mouth-wetting drink by sticking your head on the end of a high pressure fire-hose. Unless real tools are developed to filter data for us effectively, we will risk being overwhelmed. My communications problems from California were just a small indicator of just how bad things could be.

Sometime one Friday morning a small fault developed on the Internet mail gateway. The number of messages it could process fell to about 15 per hour. Normally this would not have mattered — we rarely exceed a few

hundred messages per day. Unfortunately, at the same time, someone subscribed to a Woodworking list-server. A list-server is a kind of message-robot, providing low-tech access to Internet. You subscribe by posting your email address, and the robot then sends you mail messages of every message anyone else posts. (For further information about list-servers and Internet mail, don't email me, read David Brake's column in PCW!) The number of "Recreational Woodworkers" on the Internet is difficult to judge; however, during the course of the weekend, about 1,000 messages were posted to the list.

We realised something was wrong on Monday morning when the help desk starting logging problems with non-arrival of expected Internet mail. A quick check of the gateway showed it to be slow, but working. "Nothing to worry about, your messages will be a bit late, that's all..." the help desk was told to advise. Six hours and about 100 messages later, still none of the expected mail had arrived. Further checks showed that every message that had had been delivered in the past three days was about wood. A couple of hours of detective work turned up the identity of HCI's secret woodworker. Dr Giepetto (surprisingly enough, not his real name) was away on holiday, but he would be back on Thursday. After a few phone calls to amused woodworkers in the Boston area, the list server was located and the appropriate un-subscribe message was sent out. There was no point running up massive phone bills downloading messages about wood, so the gateway was shut down until it could be fixed.

It took another day to resolve the gateway problem and get it back up to speed. About 2,000 messages were



**Nick Beard**

# Business Matters

downloaded from the list server before it could be stopped. One thought rather horrifies me: what might have happened if we had already got the leased-line 64kbs connection to the Internet in place? Who knows how much stuff we might have downloaded. The Woodworking Data Glut had arrived. Just wait until the online video glut starts.

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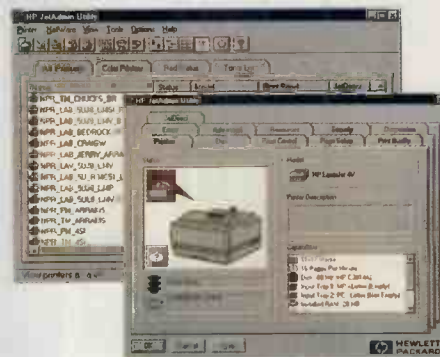
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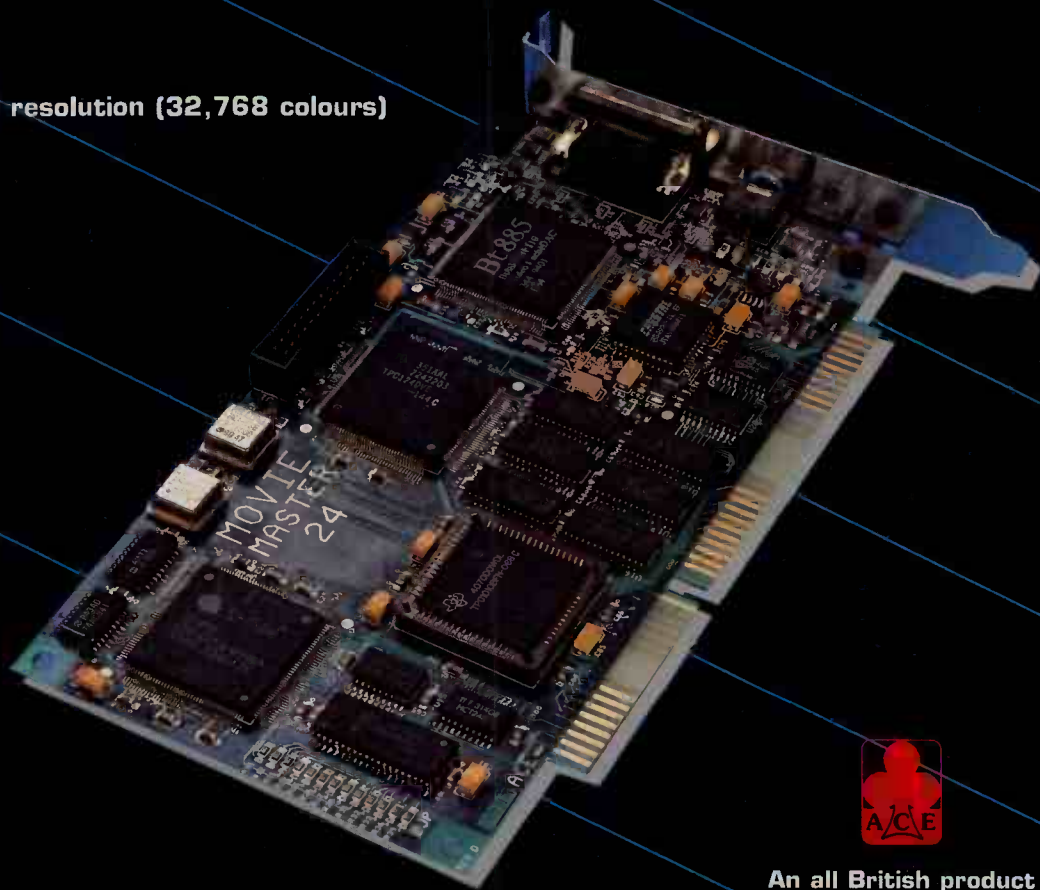
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### Windows 95? It's simply irresistible

So, Windows 95 is delayed again. The "told you so" crew must be rubbing their hands with glee. Microsoft's naming strategy is surely in danger of backfiring. Or is it? The urge, particularly for enthusiasts, to have the latest version of software is sometimes irresistible.

I daresay many PCW readers will be selling their grannies come August (or September or October...). It may be all part of a larger agenda to extract an annual "Microsoft subscription" when Windows 96, 97 and 98 are shipped. The thought of parting with all those upgrade fees fills me with woe. So will I do it? The temptation will be almost overwhelming.

**Rob Barker**

**Rob.Barker@Almac.co.uk**

### First among equals

David Busby's derision of OS/2 in favour of Windows 3.1 in last month's Letters page was way off the mark. Next time, try comparing like with like. Windows is *not* an operating system, it's a 16-bit DOS program. OS/2, on the other hand, is a fully fledged 32-bit OS, so the botched comparison between their setup and installation requirements is completely invalid.

How about redoing your comparison with a complete install of DOS *and* Windows, or, more likely, Windows NT? Then let's see how much fiddling and tweaking it takes before things work as you'd expect them to. Microsoft's breathtaking ability to hold back mainstream personal computing in the dark ages is fully vindicated by displays of ignorance such as this.

**Simon Skelly**

**simon@simons.demon.co.uk**

### Taking the plunge

I follow the OS/2 Warp debate with interest. I run a small agency representing a German company and need my

PC to be as productive as possible. I avoided OS/2 for some time: like everybody else I was becoming increasingly frustrated with the continual GPFs generated even by "big name" software.

But on the face of it, OS/2 would at least allow me to run two sessions and immediately double the number of open applications. So when a German colleague told me he'd taken a copy for his home PC as he found it more "comfortable" than Windows, I took the plunge. Version 2.11 was indeed difficult to get running, but the IBM support was second to none and the bulletin boards are full of advice on every conceivable problem.

I invested a good deal of my time and it was well worth it. What seems to be forgotten is it doesn't matter that there are few OS/2 applications available. Ignore the 32-bit desktop: Windows and all Windows applications run superbly on top of OS/2. GPFs are a rarity and should they occur are isolated to the offending application; work can be saved, the session closed and restarted quickly from the OS/2 desktop. Memory permitting, multiple Windows sessions run and you can switch effortlessly between them.

OS/2 replaces DOS, and then some. Why have a DX2/66 with 8Mb RAM and only use DOS? OS/2 effectively gives you two/three/four PCs from one.

I have just installed OS/2 Warp Full Pack. Installation went without a hitch and the system ran perfectly the first time with a significant speed advantage over OS/2 2.11. I now have 32-bit fax which behaves exactly like a Windows printer (no installed "servers") and 32-bit CIS. I can only suggest that anyone who has a mid-range PC or better is missing a real treat if they don't give Warp a try.

**Jeremy Eastaugh**  
**Warwickshire**

Send your letters to:

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### There's loyalty for you

I am (don't laugh) one of that rare breed — a Mac user. I am not one of those one-brain-celled idiots who can't use anything else: I've used DOS, OS/2, Windows (spit), the Amiga and even Unix, but I prefer the Mac OS because it is a no-nonsense sort of system that works straight out of the box without problems.

I was reading the review of the PowerBook 500s in your March colour notebook group test, and it reminded me of a story. I have a friend who was what I would call a hardcore PC user. PCs were the ultimate: nothing could touch DOS and Windows. He placed Windows on an altar and praised it.

A month ago, he dramatically converted to OS/2 Warp. This was now the most wonderful OS he had ever seen in his life. "Brilliant, perfect," he said. Now the best part. A week ago his friend bought a Mac 630 with the full kit — TV tuner, the lot. Now the Mac is the ultimate machine ever invented. He hasn't converted to it yet, but he is contemplating selling his PC to buy a 630. What loyalty!

**Aaron Platt**

**aaron@platt.demon.co.uk**

### Blowing a fuse

I turned up nice and early on the opening day of the Windows Show 95, and thought I would start with the Microsoft stand. A very nice young lady invited me into the Microsoft Experience, which was a small cinema seating about 20

people. The doors closed, the lights dimmed, and the speakers started to rumble.

"Microsoft wants you to see our vision of the information age" was the message, and the monitors around the theatre started to glow. A smoke machine generated some atmospheric smoke from the roof, and then suddenly, everything stopped.

A long pause ensued, until someone muttered "GPF" and one of the Microsoft staff re-entered the cinema to announce that they were very sorry but a fuse had blown.

Poor old Microsoft. It must have been a beta version!

**Simon Taylor**

**Compuserve 100043,104**

### Email chauvinists

Although I use email whenever possible, I think some of the writers and software producers who come out

# Letters



with so much hype need bringing down to earth. I run an electronics business and I have about 250 customers. Most of them are in the industrial automation sector (i.e. fairly high-tech) but only two show an email address. And I happen to know that one of them almost never reads his email, which incidentally is true for a lot of other people.

Given that the benefits of email to businesses far exceed its (much over-hyped, I believe) benefits to Mr and Mrs Average, it is apparent that things have a very long way to go here in the UK.  
**P Holy**  
**100103.554@compuserve.com**

### It's a real Pro — but where can you buy it?

I found your group test of PC sound cards last month very informative. I was interested in the MediaVision Pro-3D, which received a very good review, so the next stage was to phone a few suppliers. This is where the problems started.

In all 650 pages of the mammoth PCW I could not find an advertisement by a likely supplier. I rang the MediaVision number printed, which is actually that of Ingram Micros. They were not even sure if they sold MediaVision products and suggested I ring the company direct, but they could not supply a number.

The next approach was to phone a few of the "big" advertisers in PCW. The crux of the conversations I had was that MediaVision was known by some to be good but none were prepared to discuss supplying me with one of its cards. It seems that Creative Labs has beaten all others into submission, at least in the eyes of the suppliers.

Your group test was a good attempt at opening up the market and to some extent levelling out the hype about the mighty SB cards. However, some discussion

about the market availability of each product would have been useful as it plays such a major role in the decision making of buyers.

**Robin Hoad**  
**Plymouth**

**PCW Steven Helstrip** replies: *We have been inundated with calls from readers wanting to buy the Pro 3-D, so you are not alone. MediaVision is currently restructuring its distribution channels, which might explain why you haven't had any luck finding the card. We have since been assured, however, that Zytan has plentiful supplies. They are on 0181 391 2288.*

### Nick makes me sick

Please help me. Since reading Nick Beard's column in the April issue I have been unable to sleep. The dogs growl and pee when I walk by and my wife sleeps on the couch. This is a result of him stating he was not taking his laptop with him anymore.

I missed something. I use my laptop constantly in my line of work. I run an import/export business and do IT consulting. Where did I go wrong, Nick? Am I wasting my time by having immediate access to CIS and my office, and the Net and several LANs, WANs etc. here and in the States?

Knowing you and your superior intelligence, you must have devised a way to bypass the computer and go online directly from your mind. Please tell us, your unwashed masses audience!

Your April column was one of your best written yet. When you are not trying to show your readers how brilliant you are by endless expostulation, you aren't a half-bad writer. You do go on, though, which only leads to derision on the part of most of your readers.

You remind me of the guy in school who desperately wanted to be "cool", tried to

be "cool" but failed, and was mocked behind his back by the very people he was trying to impress. Are you aware that there are several people who know more about the subjects you write about than you do?

Your hospital IT project has become a standing joke in certain circles and you have become a legend. You are being used as an example of how not to run an IT department; on how to needlessly complicate matters by trying to impress everyone with how bright you are. You were able to take a reasonably simple (you don't need to re-invent the wheel every time out, Nick) IT department and complicate it to the point where it was becoming unmanageable. You stepped on the toes of some of the brightest of your suppliers and this will come back to haunt you.

I shudder to think what you would do if faced with a real IT project supervised by people who do know. You wouldn't make it past your second anal retentive memo or email before they dropped you like a bad habit. Remember the motto: "People who think they know it all piss off those of us that do," or "What you are speaks louder than what you say."

Keep up the good work and I do look forward to your column. It is one of the best.  
**Curt Easterbrook**  
**100444.412@compuserve.com**

**PCW Nick Beard** replies: *Sad, isn't it? This guy has never even met me and is desperately concerned that I might have a bigger penis than he has. Perhaps this is the real reason his wife sleeps downstairs. If he did not have such a manifestly weak ego, he might have noticed I write about what I and my department do, not necessarily what the rest of the world should do. If he*

*likes to have his laptop with him at all times, he should just relax and enjoy it.*

*The letter reminds me of a warning a friend gave me when I first started writing. "As soon as you stick your head above the parapet," she said, "the lunatics start throwing rubbish at it." How right she was. Those dogs are clearly good judges of character.*

*Incidentally, relations with our suppliers are good. Perhaps this is because your motto is not mine, Curt: I am concerned with what people do, not what they are (and writing spiteful, data-free letters says rather a lot about what you are). Here's a challenge, Curt: since you are such a fount of IT wisdom, come to Glasgow, look around the department, and tell me where I'm going wrong. If PCW will publish your story, I'll be happy to help you with your writing.*

### Medicine for a red nose

I was contacted by a very good friend, who in a panic told me I should not insert my Comic Relief Screen Saver disk because there may be a virus contained within it (he had read an article on the Internet about it). Now, while I trust my virus scanner 110 percent, I am still a little wary of playing Russian Roulette with any virus, and so I have not installed the software and therefore not been able to make the associated donation to Comic Relief.

I would like to think that, despite the problems, your readers should still have the opportunity of purchasing the screensaver and thus donating to a valuable cause. Perhaps you could release a "clean" disk.

**Wilf Voss, Esher**

**PCW** replies: *The file encryption code used for last month's Comic Relief Screen Saver caused some anti-virus software to give false*



*positives. We comprehensively virus check our cover disks and there was no virus on either the disk or the CD.*

### Working like clockwork

I have seen correspondence in varying degrees of panic about the fact that as the internal clocks on our PCs pass midnight on December 31st 1999, although they arrive at the year 2000, they revert to 1st January 1980 on the next reboot. I tried setting my clock to the end of the century, and sure enough, it did the dirty deed. But panic, at least in my case, seems unnecessary, since if the clock is actually set to January 1st 2000, it quite happily stays that way on rebooting.

**Jim Lawton**  
Leeds

### The point about decimal arithmetic

I refer to the letter from John Dudmesh (April 1995) and the

response from Microsoft Technical Support. Our company produces a range of VBXs and C++ objects which do exact decimal arithmetic in the same way as the AS/400. These simply avoid any binary representation altogether, which really can only be viewed as a bastardised floating-point view of the world; so "degrees of precision" are irrelevant.

For example, the VB currency data type always gives you four decimal places, like it or not. Our equivalent VBX allows exact specification of decimal places (from 0 to 37). If anyone does not see the difference, I suggest they send Bill Gates a cheque for £100.0099.

**F Vipond, Prospero Software Products,**  
Isle of Man

### We've only got 4Mb

The latest PCW CD is a real step backwards. The standard PC is still a 4Mb

machine — just look at the ads in the magazine.

So why change a 4Mb format for your CD to one which is a real dog on a standard PC and keeps saying "you really need 8Mb"?

**EP Baker, London**

**PCW** Robin Nixon, cover disk editor, replies: *A small number of PCW Interactive readers will experience longer delays when turning pages on the new CD-ROMs than before, but the majority should find it runs faster and more smoothly.*

*We moved to Macromedia Director because:*

- 1) *The previous authoring tool we used, Microsoft Viewer, contained some nasty bugs that would cause it to crash on some readers' PCs. It was also rather slow at loading in each new page.*
- 2) *If you have 4Mb free RAM, Director runs nearly four times faster than Viewer because it preloads all the graphics and hotspot information into memory. If you have less free RAM you can use a swapfile instead (by running 386 Enhanced Mode) although turning some pages may take longer than with Microsoft Viewer. The videos, sound files and programs run equally well using either system.*
- 3) *Director movies do not require any runtime to be installed on the PC's hard disk, and now play in the centre of the screen — the two most popular features we had been asked to implement by our readers.*
- 4) *Director movies can also include a range of features not available in Microsoft Viewer, like spinning logos, transitions and animations.*

*A new version of Director 4.0 will be available soon and one of its new features is enhanced memory management for 4Mb PCs. As soon as we receive a copy it will be used on our CD-ROMs to make them run even faster.*

### Computers for Bosnia

Marie Stopes International, a charity founded in 1921, aims to improve the welfare of women and their families. At the invitation of the EU, MSI designed and implemented a programme to assist women from the war zones in former Yugoslavia. It started work in May 1993 and now supports 55 centres run by local women in Bosnia-Herzegovina and Croatia. The self-help programme provides trauma counselling, education and advice on healthcare. MSI now comes into contact with approximately 45,000 women a month.

On the educational, occupational and social side, courses are provided in languages, dance and typing. There is a strong demand for skills and knowledge, especially among the younger women, many of whom have lost their families and have become refugees. We now wish to introduce courses in word processing and computing, and so we are asking for your help. Before you throw away an unwanted computer (in particular 386DX, 4Mb RAM, hard disk, colour VGA or better) please remember us. Likewise if you have any old printers. I am sure you know how much your help will be valued in a community struggling to get back on its feet after the horrors of the last few years.

If you think you can help us, or would like more information, please contact Fiona Frazer on 0171 388 6909, fax 0171 388 8698.



### Hindsight

#### Personal Computer



#### May 1987

Tandon launched the Data Pac removable hard disk and a midi-tower PC designed to carry two units. The disks held 30Mb of programs and data at a cost of £200. About the size of a house brick, these units were designed to let users carry their PC environment with them. The company planned to sell two PCs and one disk for less than £3,000.

#### Update

The Pac sold fairly well but the price was high and slimmer disks arrived. And if the disk did have your computing environment it could only be transferred easily to an identically configured computer. These days, a Teac combined CD-ROM/removable hard disk unit fits into a single 5.25in slot for a few hundred pounds.

#### May 1990

Intel announced the Digital Video Interactive board for £1,450. The idea was to turn the PC into an interactive video console for games and training applications. The company also brought in video technology allowing a 75:1 compression ratio. A complete editing console would cost around £20,000.

#### Update

Look at the video capture cards group test in this issue. For less than £1,000 you get the FAST Movie Machine Pro with M-JPEG add-on, Adobe Premiere and the Xing-CD M-JPEG-to-MPEG convertor.





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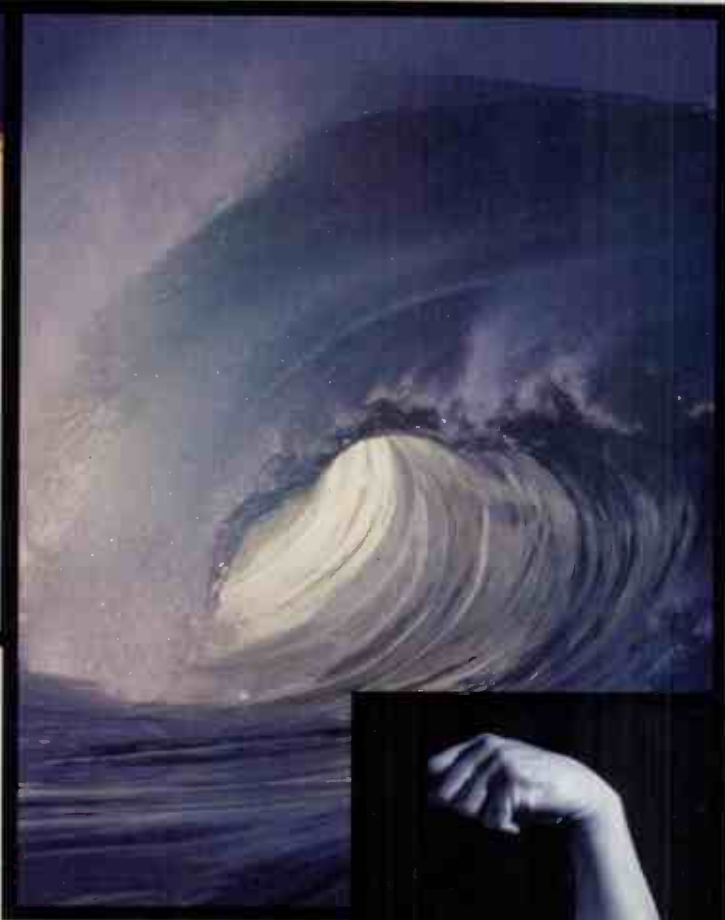
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PCW 5/95





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# First Impressions



## VNU European Labs

**VNU** Labs tests cover every kind of hardware and software including PC hardware, printers, network products, modems and software applications. The tests are continually developed and enhanced to reflect hardware and software developments.

Our tests closely simulate real-world use. For example, the suite of PC hardware benchmarks uses complete versions of industry-standard applications like Microsoft Excel and Word for Windows, WordPerfect 6.0 (DOS and Windows), Lotus 1-2-3 version 3.4 (DOS) and FoxPro (Windows and DOS).

Application tests are the backbone of all the VNU Labs system evaluations but it's nearly impossible to pin an application result to a specific machine component. Only system-level tests (also known as low-level tests) can reliably tell the difference. VNU Labs' system-level test suite is called Euromark. The tests, which are mainly Windows-based, quickly size up a hard disk, sound card, motherboard, display adaptor and printer, and give individual and overall figures.

● To make them easy to read at a glance, all the graphs in *PCW* are now drawn so that the bigger the bar, the better the result. Normally we'll also include the original data we worked from: for example, the time in minutes and seconds to print a page in a comparative test of printers.

● See next month's issue for an update on recent developments in VNU Labs.

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### Hardware

## ThinkPad 701C Butterfly

Boasting an excellent screen, highly innovative keyboard, and bags of power and features, IBM's latest subnotebook soars effortlessly above the competition. Try as he might, Ben Tisdall couldn't find a thing wrong with it — except, maybe, the price.

Only a month ago I was very impressed by Gateway's Liberty subnotebook. I had reservations about the pointing device but the large screen and high spec won me over.

But that was before IBM's ThinkPad

701C arrived on the scene. Almost all developments in notebook technology are incremental: a little more disk capacity here, a larger screen there, a faster chip, and so on. IBM's ThinkPad 701C is different. The secret is the keyboard. As a

colleague pointed out, no-one is content to open and shut the Butterfly's clamshell lid once. You have to open and close it repeatedly until you've seen for yourself how it works.

Here's what happens. As you open the lid of the machine, the keyboard divides. The left side of the keyboard moves left and the right side moves out and forward. The two halves come back together and you're left with a full-sized ThinkPad keyboard complete with eraser-head pointing device. The latest incarnation of IBM's pointing device now has a rougher tip and enhanced software for more control. The keyboard is a delight to use and within a couple of minutes I was



tapping away at full speed. The 701C is functionally identical to a full-sized ThinkPad but 30 percent smaller — a shade smaller, in fact, than Toshiba's once ground-breaking T3600CT subnotebook.

Our review machine packed a DX2/50 processor, a 360Mb hard disk and 4Mb RAM. Bizarrely, IBM still offers only 4Mb RAM in its base model and says that there's still some demand through its dealer channel for 4Mb machines. That said, most of the rest of the spec is well up to snuff, particularly the stunning 10.4in, 640 x 480 x 64K colour TFT screen on our review machine, presumably from the same factory as the screen of Gateway's Liberty.

Around the screen is a pronounced lip almost a centimetre deep, designed to hold the keyboard firmly in place when you close the lid. In use, the lip is unobtrusive. The screen itself folds back flat which is handy if you're using an external monitor. Other features include the now obligatory PCMCIA (or PC Card; see Newsprint, page 295) slot, a removable battery, built-in microphone, speaker, and SoundBlaster hardware support. Round

the back you'll find an IRDA-compliant infra-red port. IRDA-compatible infra-red now seems to have reached critical mass and will probably appear on all new notebooks before the year is out. Although the quoted range for IRDA is one metre, it's apparently possible to sit six rows apart on a jumbo and bounce infra-red beams off the roof to exchange data or, more likely, play Doom. Yes, some senior IBM executives are that sad.

The Super NiCad batteries offer two and a half to seven hours of power, and you can change the battery without turning the machine off. This ThinkPad also adds some innovative power management features: doze is a hotkey-driven power down for the screen, and safe suspend is a safer version of resume that writes all data to disk and nicely complements the standard resume mode. IBM claims a suspend battery life of up to six weeks! The whole lot weighs 4.4lbs, and the tiny power supply (100 x 58 x 27mm), port replicator and external floppy disk drive add an extra pound or so to this total. The port replicator is pretty much essential as the back of the ThinkPad has no ports other than IRDA and the replicator's own connector — unless, of course, you opt for the ThinkPad Dock II. This is the same docking station the full-sized ThinkPads use and adds stereo speakers, two ISA slots

*Is there a better way of parting with £2,835? We think not*

and another PCMCIA slot.

I struggled in vain to find anything I didn't like about this machine. It's only real drawback is its price. Prices start at £2,835 but that gets you a dualscan screen, 4Mb RAM and a 360Mb disk. The spec I'd really like — DX4/75, 540Mb disk and TFT screen — is a hefty £4,295. Corporate fat-cats won't blanch but SoHo users might find this too much to stomach. IBM's bundle includes an external floppy disk drive and plenty of software but no office suite or integrated package. With its Liberty subnotebook, Gateway includes a desktop IRDA port as standard with an external floppy disk drive as an optional extra, which seems a better idea. Let's hope IBM's patents for the Butterfly technology aren't watertight because the expanding keyboard is simply too good an idea not to be shared.

### PCW Verdict

Gallops home, by several lengths, as the best subnotebook on the market. I want one.

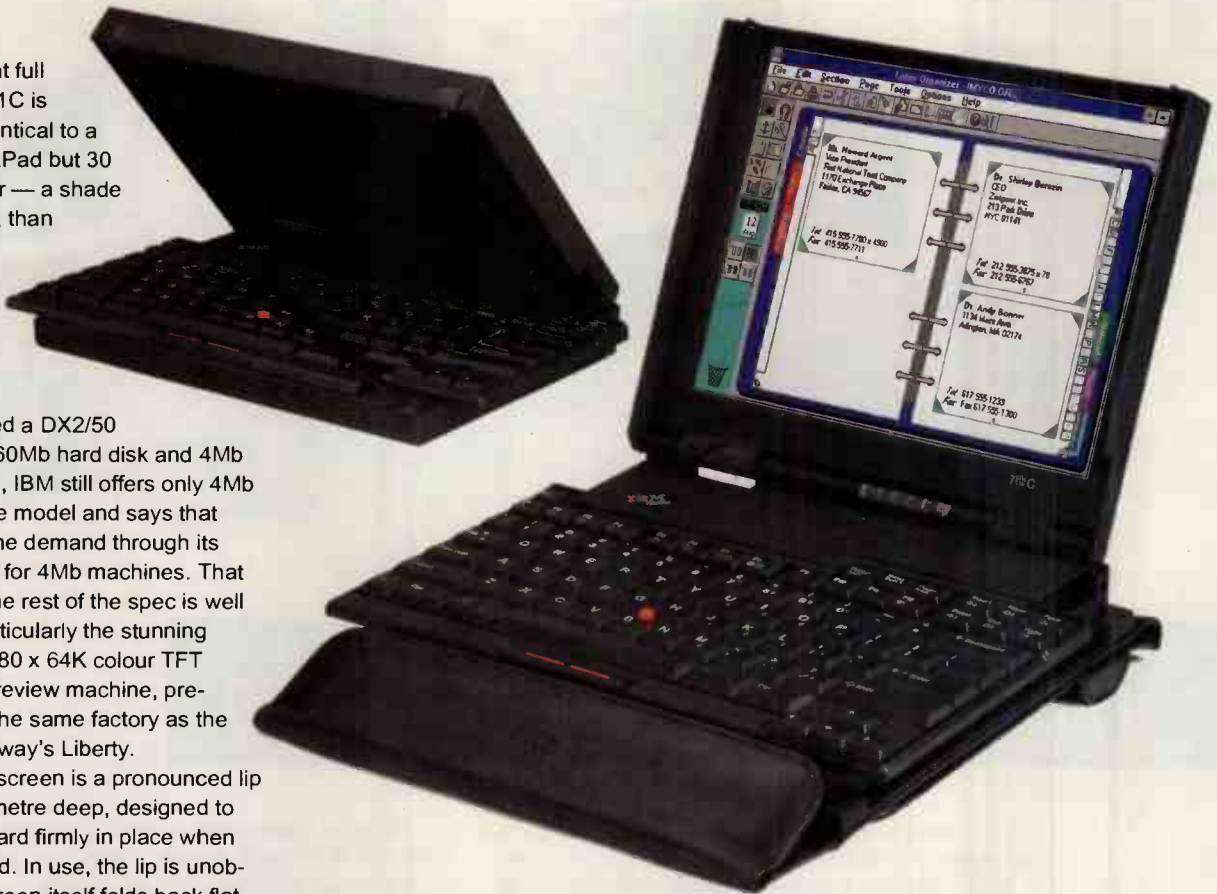
Price £2,835 to £4,295 depending on spec  
Contact IBM 01256 343000,  
Fax 0256 843168

### What you get with a ThinkPad 701C

- External floppy disk drive
- IBM PC DOS 6.3
- Windows 3.11
- Official Airline Guides (OAG) Flightdisk
- Triton CoSession remote comms package — allows IBM technicians to dial into your ThinkPad and sort out problems.
- Lotus Organizer
- Lotus ScreenCam
- Lotus cc:Mail — special mobile edition
- Puma TranXit — Infra-red transfer software
- Asymetrix Compel Personal Edition multimedia presentation software
- IBM diskette factory — utility for making program disks of pre-installed software

### Optional extras

- Extra batteries £55
- Memory expandable to 24Mb (on DX4 models)
- Portfolio — leather carry case £50
- Traveller case — modular case with space for accessories and paperwork £130
- ThinkPad Dock II — docking station £555





Best Sound Card  
Sound Galaxy WaveRider 32+  
April 1995



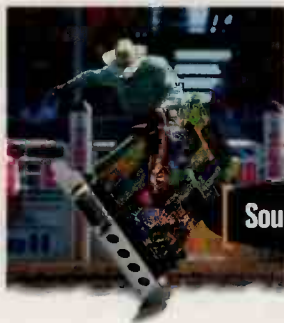
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## Software

# Lotus Organizer Release 2.0

For those of you with days and dates to remember and a memory like a sieve, the new Organizer should keep you in check. It's where PIMs are at, says Geof Wheelwright.

You would think that Lotus Organizer would already have reached well beyond Release 2.0; after all, the product has been around in one form or another since UK-based Threadz first developed the application in 1990 and then sold it to Lotus Development. But given the chopping and changing this product has seen, and its eventual inclusion in the Lotus SmartSuite set of bundled desktop office applications, it should be no surprise that it was due for a comprehensive overhaul. And that's what the recently released Lotus Organizer 2.0 is all about.

Despite a shaky rollout in late December and early January — when CompuServe users deluged Lotus with reports of various niggles in Lotus Organizer 2.0 — the shrink-wrapped product finally started shipping in late February, and its feature set proves an instructive guide to what you would expect from the PIM product category these days.

The most heavily touted new features in Organizer 2.0 relate to its network and electronic mail connectivity, which have been enhanced to provide group scheduling for Lotus Notes and Lotus cc:Mail. Lotus calls the product a "networked PIM" and boasts that it "allows easy integration of LAN-based group scheduling and daily task management features that include calendaring, address keeping, notepad filing, tracking to-do's and a new calling logging section".

While we didn't have an office full of

network Organizer 2.0 users to hand in testing this new offering, there were enough extras for standalone users to keep us busy with those. We found, for example, that you can now easily set up "user control lists" which grant different levels of access to the same Organizer file. If you have a number of people sharing the same PC, or sharing some Organizer information over a network, you can set up Organizer 2.0 to allow other users to see only parts of your Organizer. And you can customise Organizer so that different users would be given access to different parts of the file.

As a longtime Organizer user, I was also glad to finally see Organizer 2.0 including some long-demanded features such as being able to see a 30-day calendar view, book conflicting and overlapping appointments (which we can then resolve at our leisure) and attach files when scheduling meetings over a network with other people (i.e. "here's the document I want to discuss at our meeting").

If you use Organizer 2.0 with the other applications in Lotus SmartSuite, you'll notice a much better level of integration with Approach, Ami Pro, Lotus 1-2-3 and Notes. While only four of the main pull-down menu headings (File, Edit, View and Help) are consistent with the other SmartSuite apps, most of the SmartIcons are now the same. In addition, there are now tighter links within the various parts

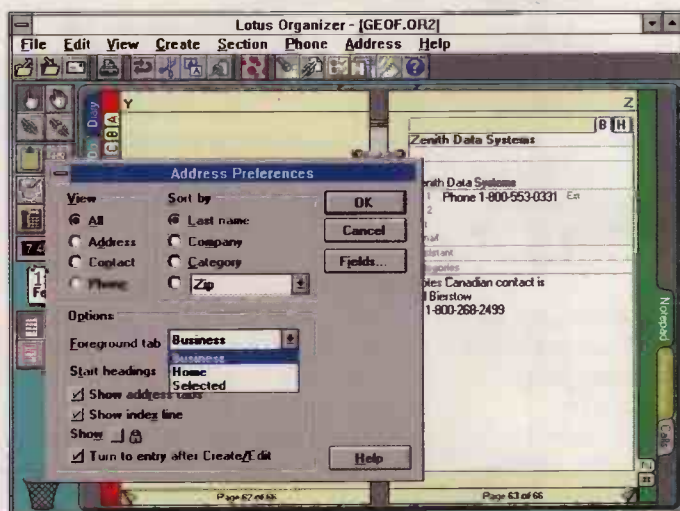
of Organizer 2.0 itself. Using the Telephone Call feature, for example, you can list and display both incoming and outgoing calls by name, date, company, category, or status — and it is finally linked properly to the address book so that you can make full use of the data there.

Given our ever-expanding ToDo list, it was useful to see some improvements here, with the ability now to schedule repeating tasks, to actually specify completion dates (known as deadlines in our business) on screen, and display your to-do tasks by priority, status, date or category.

In the address book, we welcomed the sight of both home and business address records for each contact, as well as the ability to properly customise fields. And in the planner, being able to see both yearly and quarterly views of your schedule — and put in overlapping events — does provide you with a much more accurate roadmap of your working life.

There are a couple of dubious improvements that didn't seem to add much to the package. In the Notepad, for example, you can view pages by page number, by creation date, alphabetically by title, or by category. If you're a particularly organised individual, then this might help you. But if, like most of us, you live a more "freeform" existence and expect packages like Organizer to help organise you, rather than the other way around, these features won't make much difference. Meanwhile, the fact that you can now organise anniversaries by year, month, category or zodiac sign is also unlikely to cause a major rift in the fabric of life. If you don't know the major anniversaries in your life by now, you'll probably be hard-pressed even to remember to enter them into Organizer 2.0.

On the whole, we were quite impressed with Lotus Organizer 2.0. It offered a lot of improvements to the previous version, provided a tighter set of personal information management tools than ever before, and still gave us the most sensible metaphor we have yet seen for any product that seeks to replace the daytimer and desktop diary.



*The long-awaited upgrade to the popular Organizer PIM provides more features and superior integration with other programs*

## PCW Verdict

A worthwhile upgrade for existing users and a strong PIM in its own right.

Price £99, or £49 as an upgrade from Organizer 1.0  
Contact Lotus 01784 455445,  
Fax 01784 445351



## Hardware

# Orchid Kelvin MPEG and Aztech VideoGalaxy Oscar

The flood of PC MPEG video cards continues with new releases from leading multimedia suppliers Orchid and Aztech. Although these are £100 apart in pricing, they can both be considered among the cheapest entry-level MPEG cards available. Tim Frost explains all.

## Orchid Kelvin MPEG

At £299 the Orchid is the more expensive of these cards, but comprises an MPEG player and a Kelvin Windows VGA accelerator. So if you are already thinking of upgrading your VGA card anyway, you are getting the MPEG playback function for an additional £170. The Kelvin is one of the less costly accelerator cards around and in its 2Mb version can happily deliver 16 million colours at 800 x 600.

By integrating the MPEG chip into its Kelvin VGA card, Orchid has achieved more than a price advantage. Apart from only using up one PC slot for video playback, there's no need to link the VGA and MPEG cards together using the internal features connector or a Y adaptor VGA lead. This is both neater physically and leads on to the second advantage, which is that the conflicts between the VGA and MPEG functions have already been sorted out by the manufacturer. Anything that reduces the possibility of DMA/IRQ-type conflicts during installation of an MPEG card is extremely welcome.

The card's connections are kept to a minimum with a 15-pin VGA connector and stereo 2.5mm sockets for line level and speaker outputs. This amplified speaker output, with the thumbwheel volume control, is a handy addition as it means that if the PC system is only going to be used for video replay — as a presentation tool, for example — then the Kelvin MPEG can be used without a separate sound card.

The advantage of Orchid's approach to building VGA and MPEG into the one package was proved when the card was installed and the software loaded: totally unexpectedly, it worked first time.

The whole system has been created in collaboration with RealMagic and is effectively an on-board RealMagic clone. The card uses the same Sigma Designs MPEG chip and the software is unashamedly RealMagic's latest 2.2

either under MediaPlayer (or any presentation software that supports M/M) or using the RealMagic CD Station. This is a general CD-playing package that displays a VCR-like control panel when an audio disc is loaded, or takes over the whole screen with "TV set", if the disc contains MPEG video.

Tracks can be selected at will and a slider can select any point on a track. As well as the pause/play-type controls, CD Station lets you screen-capture a still from the MPEG video stream down to a BMP file. This is handy since the video



*The Orchid Kelvin MPEG includes fast graphics and MPEG*

release. This is no bad thing, however, since RealMagic has been in the MPEG card business the longest and has had time to sort out incompatibility problems; Orchid has been sensible to take advantage of that experience.

The software is comprehensive and looks good. The installation checks the system and automatically (and correctly) sets IRQs and DMAs. After that it leaves a "Snooper" program in the startup group that checks for changes in the PC's configuration each time it's switched on. It will reset the interrupts if there's a conflict caused by a new card.

Another, perhaps less exciting advantage of the RealMagic software is that you can run RealMagic-compatible games, which are somewhat few and far between. Since the software suite also includes an MCI driver, ordinary MPEG Video-CDs and video clips can be played

image is not part of the VGA data stream and cannot be captured using normal screen-grabbing software.

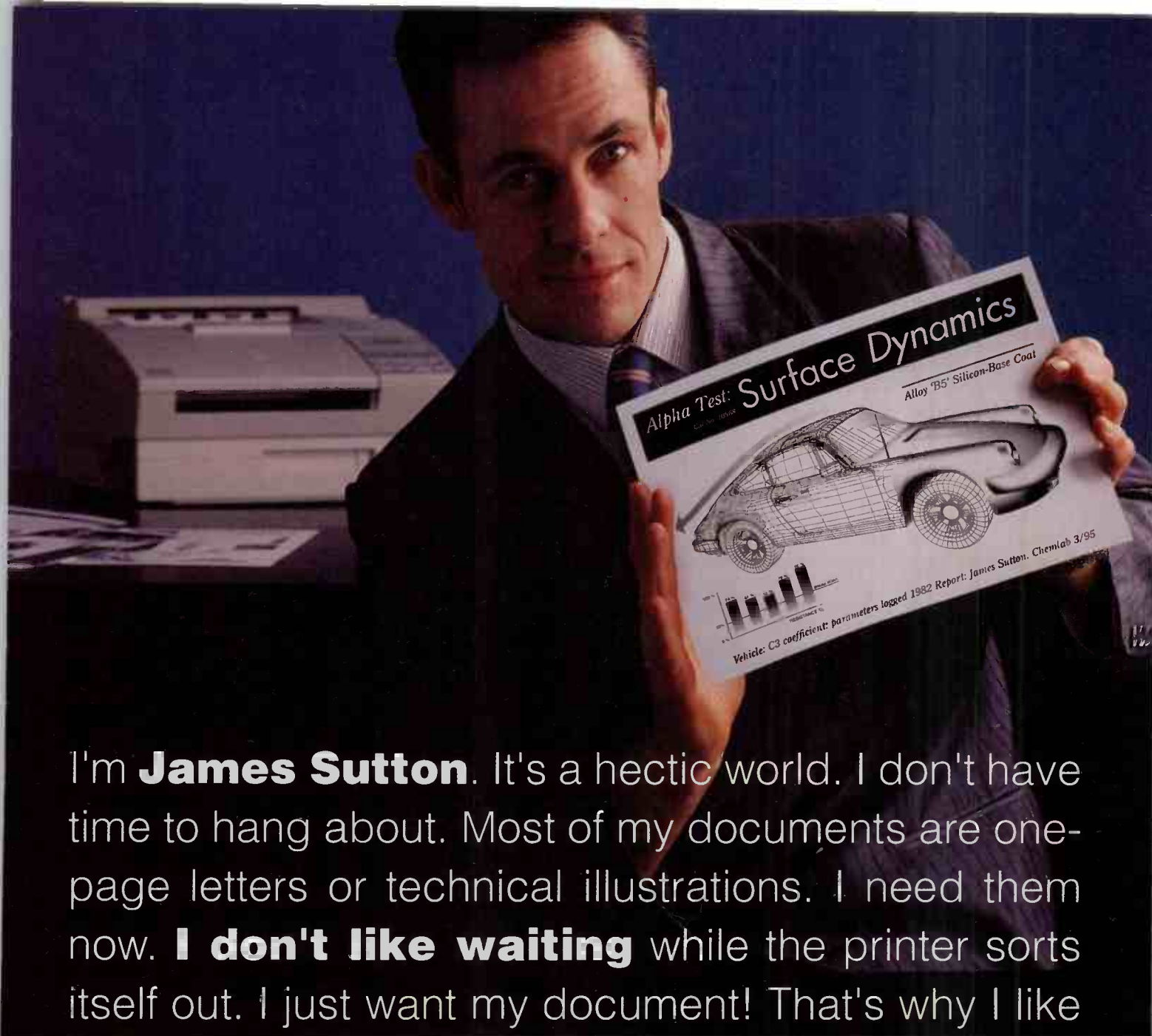
The whole thing functioned well except for a minor glitch in the pre-release software which meant that CD Station had to be closed first whenever a disc was changed.

The only disappointment was the overall video quality. While delivering 24-bit colour, the images were more noticeably "blocky" than on some more expensive cards. This was quite visible in full-screen mode although the images looked perfectly clean when reduced in size.

## Aztech VideoGalaxy Oscar

The VideoGalaxy Oscar is a separate MPEG processor that's connected to your VGA card using both the internal features connector and a VGA lead Y adaptor. Although this card has jumpers to alter base address, DMA and IRQ, the setup routine does it all for you in





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software. And again, much to the surprise of everyone, this card worked first time too.

The connections may be clumsy, the manual less than explicit (and more than a little confusing on occasions) and the picture quality average, but this is the first MPEG card that can be said to be real fun. The software is packed with goodies that are going to appeal to anyone who wants their video playback as a toy, an extra gizmo to add to your PC.

Aztech supplies just one software package called MPEG Video, which is split into two distinct sections — the Remote Control and the Playback Display. The Remote is the main controller that calls up the disc tracks and controls play, pause and fast forward, but unusually there are no reverse modes. It has audio controls for volume, bass and treble and a re-sync button to bring picture and sound back together if they get out of sync, which can happen. In other words, the Remote Control is the basic everyday control.

The Display gives four different ways of showing the video on screen. The first option is a conventional window, which offers lots of extra control facilities on the top bar. The second is a fixed size "hand-held TV" which puts the picture in a wide, grey frame. The third, Frame option reduces the surround to the thinnest Windows surround, which is much neater for normal video display.

These three options can be forced to remain on top of any application, so you can have a movie in the corner of your screen while doing other work — providing your computer is powerful enough to



*Aztech's offering is cheaper than Orchid's, but still comes with great software*

handle the data stream uninterrupted by the normal PC activities.

Finally, there's Desktop view, which replaces your Windows desktop with full-screen video, with all your other software running over the top of it. You can select the colour "key" that the video plays through, so it's possible to configure your word processor so that you type on a movie image rather than a white page.

The Oscar isn't perfect: there are a few small question marks over both the video and audio performance, but only when compared to the more upmarket MPEG cards. It isn't totally user-friendly and won't meet the needs of the professional

multimedia user. But for its sheer ability to show off video on the PC and play it out in a multitude of different ways while you're working on other things, this is one high-scoring MPEG card.

#### PCW Verdict

- The **Kelvin MPEG** is an easy to use way into desktop MPEG, and is great if you're thinking of upgrading your VGA board anyway.

- The **Aztech** means more wires, but it's cheap enough and the software is great on silly gizmos.

**Prices** Orchid Kelvin MPEG £299 (1Mb), £345 (2Mb). VideoGalaxy Oscar £199

**Contacts** Orchid UK 01256 479898, Fax 01256 64222. Aztech 01734 814121, Fax 01734 819951

#### Software

## Elastic Reality & TransJammer for Windows

Morphs, transformations, animations, mattes... if you hate your friends you can make them look like X Files-candidates without enlisting a Silicon Graphics workstation.

Karl Dunkerley turned his hand to some effects.

When the glamorous woman reclining in the Toblerone advert goes into raptures, her face goes through a gymnastic routine that a champion gurner would be proud of. This kind of video distortion is becoming commonplace in the film and advertising worlds and is fast finding its way onto the humble desktop. Saatchi's *et al* may use Silicon Graphics workstations to achieve

broadcast quality but you can create quality effects on your PC or Mac. Elastic Reality and TransJammer are standard-bearers in bringing a new generation of effects to the home and workplace.

Elastic Reality has a number of facilities for creating morphs, transformations (warps or distortions), animations, mattes and composite images. TransJammer is primarily a digital video effects generator.

The facilities certainly work well although the interface is way behind the times. There are no icons, nor is there anything like Microsoft's Wizards to guide the novice through the process. If this were straightforward the omission would be forgivable, but it isn't: there isn't even an on-screen tutorial.

The manual comes in three parts: Getting Started with Elastic Reality; the full ER manual; and a brief one on Using TransJammer. Beginners should use Getting Started first. Be warned though, Getting Started does contain the odd error and confusing statement; at one point it says to choose File and New and the Open dialogue box will open: of



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course, the New dialogue box opens.

Installation is simple, but as ER and TJ are based on 32-bit technology they install the Win32s extensions on non-NT machines. Win95 will have these built-in. Win32s does not work on every machine so it is vitally important to try the FreeCell game that comes with it. If incompatible, normal Windows can crash next time so backing up is a wise and possibly vital move.

The simplest skill to learn is transformation (also called warping or distorting). Say you wanted to produce a caricature of a friend just like the beach-front artists do in holiday resorts. The first step is to scan in a photo of said friend. Once it's captured in a suitable format, you insert the image file into the Sequence Editor and Accept it. Next you need to decide how to distort it. On a simple level, you could draw an oval around your friend's face and then draw a larger one outside. Click the smaller oval, hold down the Shift key and click the larger one. Using the Join command, the two ovals become linked.

You are now ready to render the effect over the number of frames previously specified. Output can be in a large number of formats but you will normally use Microsoft AVI. As a quick check, you can render only the last frame to make sure the distortion has worked. If you're happy



*Eye eye — Elastic Reality lets you distort images in hundreds of different ways*

with it you can render the whole sequence and play it as a Video for Windows file. With this effect you will be able to prove conclusively that your friend is a big-head. Using other tools, you can distort any other body part, large or small.

For a laugh, you can then morph him to a chimpanzee if you have a suitable image file. The process this time is to load both images into the editor. On your friend's picture you use the Pen tool to outline his nose. Copy this to the second image and use the Reshape tool to map this shape over the chimp's nose. Again, you join and render the images. Repeat this for each body part and you

can create a smooth transition from man to ape.

The animation facilities can also be good fun although the manual does not seem to be in step with the released program. You can define the path an object takes, the keypoints at which it changes, the rate of motion and the degree of transparency. The image can change shape if you like; for instance, when two objects clash together. The composite facilities let you cut an image out of one scene and paste it over a different background. A

travelling matte feature lets you move one object over a different background to give a "flying carpet" effect.

TransJammer produces some great digital video transitions like Top of the Pops. Quantel systems to produce these used to cost a fortune. TJ's effects do go beyond the current level of Adobe Premiere but the package lacks any true editing facilities and this limits its potential.

### PCW Verdict

Elastic Reality will give hours of fun to anyone with a devious mind or creative bent.

Price £399

Contact Softline Pro 0181 401 1234

Fax 0181 401 1235

### Software

## Windows utilities

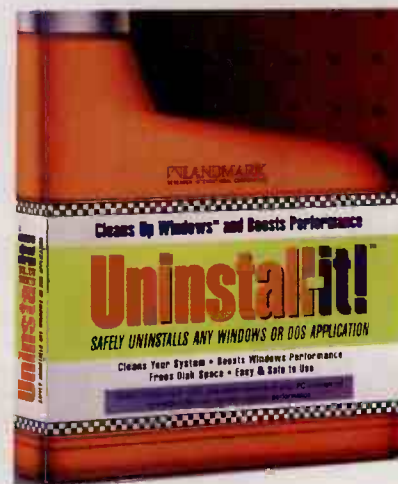
If you really don't know what's in the mess of applications you call a windows setup, there are utilities around to help you find out. Geof Wheelwright gets to grips with three of them.

### Landmark Uninstall-It

This is typical of the new generation of Windows applications "uninstallers". It is designed to help you perform several tasks: carry out clean removal of unwanted Windows applications from your system; move Windows applications to a different directory or drive without losing their Windows properties and associations; safely compress and back up Windows applications that

aren't in regular use; and find lost or stray applications on your disk that are no longer in use.

Like many other applications from smaller software houses, Uninstall-It is written in Visual Basic so no other Visual Basic applications can be running when you start installing or using it. Once installed, it offers you an opening screen providing four choices: Scan Applications, Find Strays, Find



Duplicates, Restore Backups.

Selecting the Scan Applications option reviews the Windows groups and icons installed on your system, and figures out



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*PC User November 1994*

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*Personal Computer World  
December 1994*

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which program groups, files, items, icons and entries are associated with each installed application.

Next, you can uninstall, move or back up any of the installed applications and their associated files. Given that Uninstall-It is designed to remove not only an application but also all the data files you created with that application, we found it essential to use the backup option before doing anything.

This backup process offers you a number of options, including a chance to list all the elements you're planning to back up. If you're unsure about the content of any of these files, they can be viewed individually using the Uninstall-It data viewer, which offers you views of data held in most popular Windows data formats.

Once you have selected the files you wish to work with, Uninstall-It will tell you how much disk space will be freed up by uninstalling the application in question, how much will be needed to back it up, and the amount of space left if you back it up and uninstall it on the same drive.

The latter option is not as crazy as it sounds because Uninstall-It backs up files by compressing them into a ZIP file. This makes it sensible to uninstall those applications you only use once every few months by doing a backup and uninstall on the same hard disk, thereby allowing you the option of restoring the application from the backup file without having to completely re-install your software from its original floppy disks. What makes this option really useful is that restoration of backed-up applications automatically restore files and entries to their original locations on your hard disk.

There are, however, some glitches. One is that Uninstall-It will not work with WIN.INI files larger than 21kb in size. Its publisher, Landmark Research International, has released a fix for this bug, but you should be aware of it if you decide to use the product.

### WinDelete

A somewhat slicker uninstaller for Windows applications comes from California-based IMSI in the form of WinDelete. It takes a completely different approach from Uninstall-It. Rather than being designed primarily to help users grapple with uninstalling Windows applications which already reside on their hard disk (although it can do this), WinDelete is optimally used as a resident safeguard system which manages the installation of all new Windows applications.

It is designed to keep a log of every single file copied to your hard disk during a Windows application installation, as well as keeping track of all changes made to INI, BAT, DAT, SYS and other system files. By creating its own database of such modifications and changes, WinDelete is in a better position to accurately uninstall applications when they're not needed.

It is a great package for anyone using a new hard disk from a standing start who wants to be able to delete applications after that. It is less useful, however, for those who already have hard disks full of old, existing Windows applications that they want to get rid of.

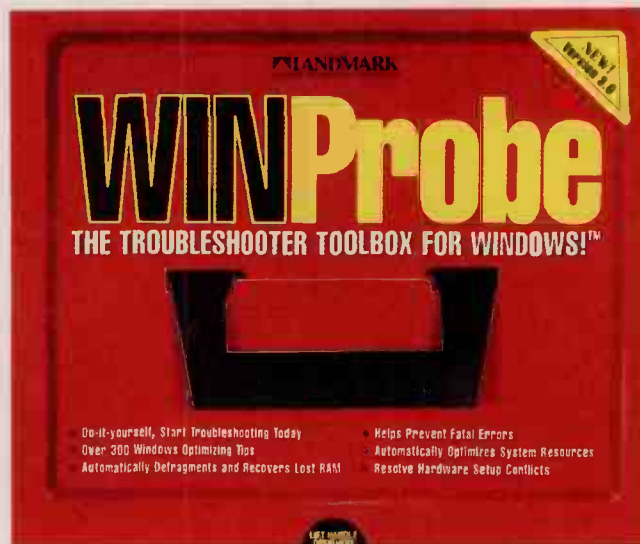
### WINProbe 3.0

More comprehensive is Landmark Research International's WINProbe 3.0, which falls broadly into the category of diagnostic and systems analysis tool for Windows users. Unlike some of its competitors, WINProbe performs all its diagnostic work within Windows and doesn't need to start up a DOS session to find out, for example, which version of DOS you're running.

WINProbe is designed to hook directly into the internal elements of Windows' building blocks such as its task list, memory management components and operating modes.

It will also run happily on Windows 3.x and must be one of the few remaining diagnostic packages to be able to run in Windows 3.0 Real Mode.

WINProbe bills itself as a "troubleshooter toolbox" for Windows and could be the kind of package you don't know you need until it's too late. When we looked at all the hardware tests it includes, we remembered many occasions on which it could have come in very handy. For example, it will carry out configuration tests on CD-ROM players, sound cards, CPUs and system boards, maths co-processors, memory, video adaptors, screens and more. It includes utilities to carry out drive utilisation tests, report on the accuracy of keyboard and scan codes, carry out mouse initialisation and so on.



Another really useful feature for offices where processor and hard disk loads constantly change is the Realtime Status Panel, a "strip-off" control panel which can be removed from the main WINProbe application window and be left floating on screen while you use other applications. It will offer you realtime information on things such as system load, cache hit rate (to help you determine whether your RAM cache is set up optimally), what system resources are available and what the current amount of free RAM is at any given time.

WINProbe looks like a useful set of tools for anyone who ever needs to explore their Windows system thoroughly.

### PCW Verdict

- **Uninstall-IT** is a good product for those who have lots of Windows applications which they want to be able to uninstall safely from their Windows system.

- **WinDelete** is a more comprehensive and safer option if you're able to install it before you install any other Windows applications. But it's much more limited in function than Uninstall-IT.

- **WINProbe** is a versatile and comprehensive diagnostic and systems analysis tool, ideal for those who want to get to know their Windows system well.

**Prices** Uninstall-IT £49; WinDelete £49.95; WINProbe £69

**Contacts** Window Line 0181 401 1177, Fax 0181 401 1178 (WinDelete and WINProbe); IMSI 0181 758 1447, Fax 0181 581 2200 (WinDelete)



## Software

# PhotoFlash 2.0

Photoshop is great for preparing images but it's expensive if you don't have the know-how to use it to the full. Cliff Joseph takes a bite out of Apple's alternative.

PhotoFlash is designed to be "Photoshop for the rest of us". It was developed by Apple, together with Storm Software, for home and business users who simply want a quick way of preparing scanned images for use in DTP and presentations.

The first order of business with version 2.0 was to bring it into line with recent developments in the Macintosh product line. That means a native PowerPC version of the program, plus support for System 7.5 features such as Drag and Drop and AppleScript. As expected, the native PowerPC version runs two to three times faster than the 68000 version. But just to see how good Apple is at writing code for its own PowerPC machines, we also compared the speeds of the native versions of Photoshop and PhotoFlash.

Oddly enough, PhotoFlash proved almost 30 percent faster than Photoshop when performing tasks such as rotating an image, but slower than Photoshop by the same margin when it came to resizing. Photoshop has many more filters than PhotoFlash but comparable filters worked at almost identical speeds.

PhotoFlash takes up only about half as much RAM as Photoshop, so it's more likely to run on machines used in homes and small businesses. Even so, you're still likely to need 8Mb — on both 680x0 and PowerPC machines — to get good results.

PhotoFlash 1.0 consisted of two separate programs: the main editing program was accompanied by a browser program that could be used to catalogue and view graphics files. These two programs have been rolled together in version 2.0 so that you can create and view catalogues from within the editing program. The browser has also been improved so that you can open multiple catalogues, and new search options have been added.

As well as the standard ability to search for filenames, or for words contained in captions, you can select an image from a catalogue and tell the Browser to search for other images that have similar colour content and composition. There's also an odd search tool that

PhotoFlash is one of the first applications we've seen that's fully scriptable and recordable, so you can create scripts simply by recording your actions within the program. The simple built-in script editor can be displayed at any time just by selecting Script Palette from the Window menu. Apple has provided a large number of scripts with the program

that can be used to perform tasks such as creating catalogues and placing images within other applications. There are even scripts for controlling Apple's QuickTake digital camera, for the few who have actually bought one.

A welcome addition is the ability to adjust the strengths of the individual reds, greens and blues within an image. This is the only major addition to the image editing tools, though, and it's disappointing not to see a few more changes here. At the moment PhotoFlash can only apply changes to selected areas, but any self-respecting image editor really ought to provide a pen or brush tool that could be used to edit right down at pixel level.

It would be very difficult to remove a minor blemish such as a mole from a picture of someone's face. There's no Fill tool, either, something that would come in useful if you wanted to quickly block

out a background. That said, PhotoFlash is easy to use and the tools it does provide are effective and easy to use. The recommended price is far too high — about £150 compared with \$130 dollars in the US — but it's worth considering if you shop around and can get it for £100.

## PCW Verdict

A simple and effective alternative to Photoshop, but too highly priced.

Price £150 approx

Contact Apple UK 0181 569 1199,

Fax 01753 537302



**1** PhotoFlash 2.0 combines its cataloguing and editing tools into a single program

**2** The main addition to its editing tools is this colour adjustment option

presents you with a small pixel grid into which you can draw a sketch, and then tell the program to search for images similar to your sketch.

These two features seem to work rather erratically and often locate images that have no obvious similarity. The sketch area in the latter feature is so small that it's hard to draw anything more than a crude shape, which doesn't provide much of a basis for searching on. However, they do provide a looser way of searching than just by using filenames or captions, and they might be good if you've got a large catalogue and aren't quite sure what you're looking for.





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## Hardware

# Lexmark Optra R

Hewlett Packard beware — this new SoHo 1200dpi printer is versatile, inexpensive, and even produces high-quality copies, reports an awe-struck Steven Helstrip.

Optra is the latest range of printers from Lexmark, which has five products in the offing to suit a variety of single-user and network environments. The Optra R, reviewed here, is geared towards the SoHo market and has a 200-sheet input tray and 2Mb RAM as standard, although the review machine was supplied with a further 8Mb.

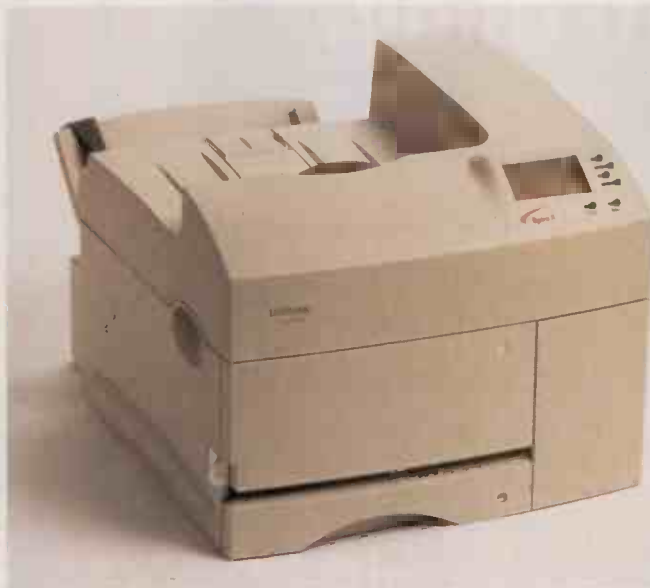
As a former division of IBM, Lexmark has spent the previous years phasing out IBM's trademark from its logo. The Optra represents this final stage and a new look for Lexmark. Unlike the company's previous products, which were often described as boxy and sometimes as ugly, the Optra is its first printer which can truthfully be described as stylish.

Good looks and design are only part of its make-up. The Optra also offers PCL 5 and PostScript level 2 emulation as standard, not as optional extras (as is often the case with other printer manufacturers). It's also the first 1200dpi printer not dependent on software interpolation. When printing at lower resolution (300 or 600dpi), resolution enhancement or Print Quality Enhancement Technology (PQET) can be applied.

There has been much discussion on whether print quality can be improved by increasing the number of dots placed on the page. Hewlett Packard says the most effective way to improve output is to position the "traditional 600dpi" more carefully on the page and that resolution enhancement is equally as important. Lexmark, however, has settled for a combination of the two theories.

Installation was straightforward and drivers for Windows and DOS applications were set up automatically. Lexmark's printer utility, MarkVision, is also installed.

MarkVision is similar to Microsoft's printing system and provides extensive



*Not just a pretty face, the Optra R copes well with a wide variety of media*

feedback on print status and job statistics. It displays the printer currently in use and a copy of its control panel. From a network supervisor's standpoint, MarkVision is probably the most useful printing utility ever as it allows each printer to be configured from a remote PC via bi-directional communication. It informs you of the amount of RAM each printer has, whether a duplexer is installed and of its hard disk properties, if installed.

Lexmark predicts the largest area of market growth will be in network printing and the Optra is well prepared for this. As well as serial and parallel, there's simultaneous support for 18 network protocols including Novell NetWare, AppleTalk and OS/2 LAN Server. The printer's SmartSwitch changes to the correct protocol and printer language automatically. There are seven network adaptors to choose from, each with Flash memory for installing or upgrading network protocols.

The printer's control panel is a 20 x 4 LCD display and is accessible from both software and six buttons on the front fascia. The operating system is clearly thought out and intuitive. There are four

submenus, each with reams of parameters. If a network adaptor, hard drive or Flash memory is installed, further menus become available.

Flash memory (up to 4Mb) is available for storing fonts, macros and forms. This vastly reduces network traffic and increases print speeds. Utilities within MarkVision are supplied for downloading custom patches and forms.

Installation of RAM, hard disks and network adaptors can be carried out with relative ease. The righthand side of the case is mounted on a hinge and opens to reveal SIMM banks and connectors for disk and network adaptors. Maximum RAM on all Optra systems is 64Mb using two 32Mb SIMMS. The hard drive option is currently 40Mb.

The Optra R's paper handling is excellent: it has one paper bin as standard with an additional single-sheet feeder at the rear for card and other media including labels and envelopes. The input tray has a useful paper gauge visible from the front of the unit so

you know when you're about to run out of paper.

We threw all types of print samples at the Optra including text, photographic images, bitmap and vector graphics, all of which printed successfully in a variety of resolutions. There is a clear difference between documents output at 1200dpi over 600dpi. Text becomes cleaner, images are smoother and more shades of grey become available. High-quality paper is needed, though, to benefit fully from 1200dpi printing. That said, even at 600dpi the print quality is comparable to that of the HP 4si.

The 8Mb upgrade is essential for printing at 1200dpi as memory requirements start to run pretty high. The Optra Lxi, for LAN printing, is supplied with 8Mb standard. It comes pre-installed with a network adaptor and a 1,000-sheet paper tray.

## PCW Verdict

A versatile printer highly suited for small workgroups and LAN printing. Watch out, Hewlett Packard.

Price Optra R £1,299, 8Mb upgrade £390  
Contact Lexmark International  
01628 481500, Fax 01628 481886





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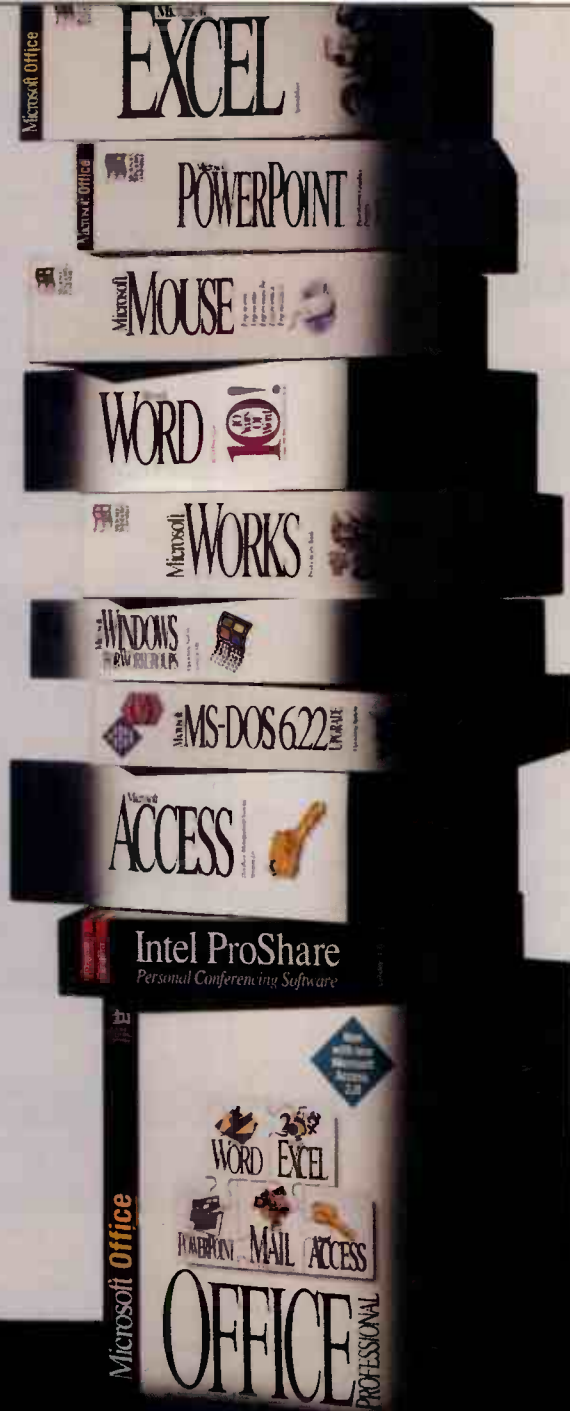
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## Software

# AVID VideoShop 3.01

Versatile, good value for money, and positively packed with useful features, this latest version of the popular multimedia authoring package deserves to win itself a lot of friends, says Mike Collins.

**A**VID's VideoShop software has been around in various versions for some time now and is a viable alternative or complement to Adobe Premiere for QuickTime video editing. This latest version is PowerMac Accelerated which means that effects creation is faster by 100 to 150 percent. It is also fully compatible with QuickTime 2.0, and is the first software I am aware of which lets you take advantage of the new enhanced MIDI features available via QuickTime 2.0.

Just about all the features you might be looking for in this kind of package are available with VideoShop 3.01. For instance, you can use it with any of the QuickTime video digitising cards, such as Radius VideoVision Studio or RasterOps MoviePak Pro Suite, as well as with any of the AV Macs or PowerMacs. AVID has also now made this software work with its own MediaSuite Pro video digitising hardware, which none of the other QuickTime video editing packages will do. And as far as control of external VCRs is concerned VideoShop supports VISCA, RS422 and Sony Vbox protocols, which covers most professional and "prosumer" models of VCR. With a suitable VCR controlled directly from within VideoShop you can log all the clips you want to record from your VCR and then use the batch digitisation feature to automate the capture process.

Getting started couldn't be simpler. You just open up a folder containing video clips from the Desktop Folder Access Menu, and drag the "micons" (movie icons, showing the first frame) of the clips you want to use into the sequencer, placing them in the order you want them to appear in Storyboard View. To trim and edit these you switch the sequencer to Time View which shows the frames with a time readout above them. Here you can rearrange or delete frames, and apply filters and transition effects. To view your movie you can press the spacebar or click the Play



1 VideoShop's main view

2 The sequencer looks similar to Adobe Premiere

button in the Canvas window. The Canvas window displays the video and plays it back smoothly without having to build preview files as you do in Premiere — which makes VideoShop appear to be rather more responsive as a result.

So what's new when you open up the software? Well, straight away I noticed there's a new Info Palette which gives you instant feedback in a convenient way, and there are a couple of very useful new buttons on the redesigned toolstrip for Quick Fade In and Quick Fade Out. Then there's the new Trim dialogue which lets you quickly trim the heads and tails of adjoining clips.

I decided to go through the short tutorial manual to put together a test movie and found this very easy to follow. It guides you through how to import a few video clips, edit these using cut and paste, set up a transition, add a filter, add a video overlay track and reduce this to fill the top left quarter of the screen, add a scrolling title, and add both audio

and MIDI tracks. Once you have finished editing you can save your work as a standalone QuickTime movie, and display this on your Mac screen or transfer it to video cassette using the Print To Video feature. I only encountered one problem here, which happened when I saved a version using the MIDI music track, and this appeared as 8-bit audio in the final QuickTime movie but at a very

faint, unusable volume level, and with the fades "messed up" to boot.

Otherwise it was all quite straightforward, although it did take over a minute to save as a movie, and my test project was less than seven seconds long!

The comprehensive User's Guide explains some of the more advanced techniques you can use. For instance, you can export portions of clips as "filmstrips" to painting applications such as Fractal Design Painter or Adobe Photoshop, where you can paint or draw on individual frames to create customised effects and details. Another possibility is to shoot some video

against a blue background, "key out" the blue using the chroma key feature and place a background of your own choice behind the video. You can create complex transparency effects using the three-track Alpha Map filter, which takes the middle track and uses it to create a dynamic alpha channel. The third track is revealed through the first by using the second to set the alpha values.

A neat trick here is to create the effect of video in a moving title by combining scrolling text with an Alpha Map filter. Then there's the Mesh Warp filter which lets you stretch, shrink, or twist an image based on a modifiable mesh. This is similar to the Morph two-track filter which lets you morph from one image in the top track to another in the bottom track. These tools are similar to those available in Gryphon's Morph software. And there are the Transcript Tracks and the Delayed Video Wall, but you'll just have to check those out for yourselves — I'm out of space right now.

So, to wrap things up, I can definitely say that I was far more impressed with this release of VideoShop than with any of its previous incarnations. AVID has



done some serious work here and added several features which many multimedia producers are going to find extremely useful, even if they are already using Premiere, VideoFusion or After Effects. The package represents extremely good value for money, especially as it comes

bundled with another excellent piece of software in the shape of Specular's LogoMotion (which lets you quickly create flying 3D titles or logos), and with a royalty-free CD-ROM full of useful video, music and sound effects clips to get you started.

## PCWVerdict

An excellent package that's also good value.

Price £299

Contact AVID 0171 434 0122,

Fax 0171 434 0560

## Software

# LottoWin

If there's a blank space below you'll know that this software to help you win the National Lottery has worked and Paul Begg is lazing on a beach in the Bahamas. If there's a review, then he's still a struggling hack writing First Impressions for PCW.

It's Saturday evening and Mystic Meg has done her bit: a Lottery winner will have a name beginning with "Q", be wearing a gold and puce evening dress and heavy eye makeup, and his birth sign will be Aries. Then the moment comes. The numbers are read out. Nope, haven't got that. Nor that. Missed that by one. Ah, well, another week of poverty stretches ahead.

We've had the Premium Bonds, football pools, and the hopes of a fortune when a rank outsider in the 3.30 at Sandown romps home at a trillion billion to one. But the National Lottery, every week making millionaires and multi-millionaires, has grasped the nation's imagination and caused more people to speculate about what they'll do when the fortune is theirs.

LottoWin is a lottery analysis, prediction and management program. It isn't the joke or complete waste of time it appears at first glance, and those of you who run a syndicate might even begin to wonder how you ever managed without it.

First off, I should say that it isn't restricted to the UK National Lottery, but will work with the French and Irish lotteries etc, so it can be used wherever you live. Basically, LottoWin is a lottery database. You can store all the winning numbers, winnings and so on, analyse the results. The program can store virtually any type of existing lottery and has the ability to maintain and analyse all its draws, including winning combinations and the amounts won.

Syndicate organisers will find the Syndicate Tables invaluable. Here you can record the names of the syndicate members and the number sets of each

The screenshot shows the 'Open Lottery Table (UK Lottery)' window. It contains a table with columns for Date, Numbers (1-49), Bonus, Match 3, Match 4, Match 5, and Match 6. The table lists several lottery draws with their corresponding numbers and prize amounts.

| Date     | 1  | 2  | 3  | 4  | 5  | 6  | Bonus | Match 3 | Match 4 | Match 5   | Match 6        |
|----------|----|----|----|----|----|----|-------|---------|---------|-----------|----------------|
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**IT'S YOU! — well it could be, if you organise your Lottery syndicate using LottoWin**

member; it'll take as many members and member sets as you have. But where it really shines is with the Money Manager. Each member has their own Money Manager which keeps a record of their transactions and winnings. It even allows members to pay for games in advance and on credit, and detailed reports can be printed out. You can add new members or members' numbers, edit existing ones, or delete members when they resign or default.

I particularly liked the Test Number Generator. Have you ever stood there, sucking the end of your biro as you tried to work out your numbers: "Now, have I done 42? Damn. I've done it twice!" And as you start to fill in the form for the third time, don't you just hate those bright sparks who walk in, jot down their pre-chosen numbers and vanish towards the counter to pay? A chap in my local has

all the numbers written on bits of card and he pulls them out of a bag to select his Lottery combination. This is effectively what the Test Number Generator does, but it's slicker, neater and quicker.

Numbers are chosen by the computer at random and displayed against a coloured background. You can increase the randomness by only noting down the numbers which come up against a chosen colour.

There's also a Simulation Database which is capable of creating, maintaining and analysing years of simulated draws with all the features of the Lottery Database, and the package includes all the essential tools for predicting a calculated set of numbers based on Lottery Database, Simulation Database, or the computer's own random number generator.

My main complaint is that installation is as unfriendly as someone who spits in your face. A readme note warns you that installation can take 10 to 15 minutes and the "percentage complete" bar can stay at the one position for a lengthy period of time. A fly in my office died of old age while that bar stuck at 38 percent. Also, LottoWin may not run correctly with 32-bit file access and some high-end graphics cards, in which case you have to open the Windows Control Panel and, under Enhanced, set the option for 32-bit file access to false.

Finally, adding to its unfriendliness, it is copy-controlled and can only be installed twice from the original disks. Similarly, any installation from copied disks will also result in an error. This all comes about because a bit of how's-your-father without which LottoWin won't work is contained in a thing called a Protection Token. There are two tokens. One is copied from the floppy when you



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install the software. Install the software again and the second token is used. Go for a third installation and — sorry, no protection token: LottoWin will refuse to run.

In order to move LottoWin from one machine to another you need to use the Transfer Token program which moves the Protection Token from the installed LottoWin to the second version, which, of course, means that the first LottoWin won't work. Got that? Right. Now, the

manual warns that you should copy the Protection Token to the second LottoWin setup disk, otherwise the token will be lost and you will not be able to recover it. I'm not sure what happens if a rogue piece of software decides to trash some of the programs on your hard disk (which can happen and happened to me the other day, causing *big* problems). Or what about accidental deletion? Presumably you have to buy another copy of LottoWin.

Overall, though, if you take your National Lottery seriously or if you manage a syndicate, this is a package well worth taking a look at.

### PCW Verdict

A bit of fun but also a handy tool, especially for those who run a syndicate.

Price £19.95

Contact Blue Quetzal 0181 810 6500,  
Fax 0181 998 3602

## Software

# CD Studio

The latest digital delight from Gallery Software lets you copy data from audio CDs straight to hard disk. Ian Waugh sounded it out and quickly added it to his must-have list.

Gallery Software's CD Studio for the Mac will be of immense interest to musicians, people who create QuickTime movies and anyone who uses digital audio for multimedia. It performs a very simple but useful and powerful function: it transfers audio data from a CD to your hard disk.

The advantage of doing this rather than playing a CD and recording the sound using a microphone or line input is that the sound remains in the digital domain, thereby preserving its quality. It's also a lot easier and less fiddly than setting up recording levels and so on.

CD Studio uses a password for copy protection. When you install it, up pops a reference number derived from the system you are running it on. You must then call Gallery for a password, so make sure you install the program during office hours! This limits the program's use to a single machine.

In order to do its stuff, CD Studio requires an Apple double-speed CD-ROM player such as the CD300, CD300i or CD300plus/e using the Apple CD-ROM driver, preferably version 5.0 or later. Other drives using the Apple CD-ROM driver may work but you should check with Gallery first if you have a different drive.

The program is very easy to use, and it needs to be as it has the shortest manual I've even seen — a mere three pages of instructions, two of which contain installation instructions and a keystroke table. What's rather funny is that four people are credited with writing it. Okay, guys, the program is easy to use, but a

five formats: SD II (Sound Designer II), AIFF, Snd, WAV (for Windows) and QuickTime. It can create a mono recording from a stereo file and split a stereo recording into left and right files.

I love it. CD Studio makes working with sample CDs so easy that you'll wonder how you managed before. Just make



CD Studio — Transfer audio files from CD to your hard disk with CD Studio

little walk-through wouldn't do any harm.

Basically, you pop an audio CD into your CD-ROM drive and CD Studio lists the tracks. You can save a complete track or use Mark In and Mark Out functions to isolate specific sections. Having selected a region you can move the start and end points until you have the exact section you want.

A loop function, which could loop around a selected area, would be useful. As it is, when the program reaches the end of the marked section, it simply continues playing the track.

The program can save files in one of

sure you don't infringe copyright with commercial CDs.

Incidentally, if you have Digidesign's SampleCell, check out Gallery's SampleSearch which does all the things SampleCell's software should do but doesn't, and can transfer audio from CDs to your hard disk too.

### PCW Verdict

An excellent utility for anyone who wants to use sounds from audio CDs. A couple of extra features would make it even better, but it's easy to use and highly recommended.

Price £95

Contact Gallery Software 0171 431 6260,  
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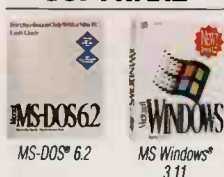


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### SOFTWARE



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- 1MB Video RAM
- 14" SVGA 0.28dp Low Radiation Colour Monitor
- Ergonomic Keyboard & Mouse
- Double Speed CD-ROM
- Desktop Case
- MS-DOS® 6.2 & MS-Windows® 3.11
- Lotus SmartSuite (Lotus 1-2-3, AmiPro, Freelance Graphics, Approach and Organizer)

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|   | Add  |
|---|------|
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All prices exclude VAT

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| Delivery                     | £15.00          |
| VAT 17.5%                    | £171.32         |
| <b>Total to pay</b>          | <b>£1150.32</b> |

### EXAMPLE 2

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|----------------------------------|-----------------|
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| Delivery                         | £15.00          |
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PERSONAL COMPUTER WORLD  
MAY 1995

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**PLEASE QUOTE PCW04**



## Hardware

## Primax DataPen

Who could possibly resist a pen which reads text straight into Windows from a business card or letter? Clive Akass knows who...

Some devices are so obviously useful in concept and yet so rarely seen you suspect they must be fundamentally flawed in practice. Thus is the Primax DataPen, which every hack and huckster between here and Ulan Bator would own if it really lived up to its promise. The idea is that you have only to sweep the pen across a line on a business card or letter to feed names, addresses and other text into any Windows application.

Of course, it doesn't work that well, although it does make a creditable attempt at reading a wide variety of type-faces. The success rate depends much on the source text, rising to close on 100 percent for phone numbers on letters and

other well-printed documents. Errors increase on hard-to-read business cards to the extent that typing may be quicker, but the DataPen is still worth using because you can check the numbers as they are read in.

It is fatter than an ordinary pen but still sits easily in the hand. On the tip is the sensor, which lights up in use. White lines etched on one side, and a cylindrical roller which resists lateral movement, help you restrict your sweep to the target line.

New to the latest model is a sliding switch which allows you to adjust to three different sensitivities.

On top of the pen is a click-switch which you can set up to send a command or string of commands to the PC. We configured this to send a Tab code so that we could read a name, address etc straight into Word for tidying up before exporting

it directly to Idealist as a tab-delimited database record, which worked very well.

You can set up the DataPen software to translate specified characters into strings or commands; for instance, a vertical line can be translated as a tab so that a printed table can be read into a tab-delimited spreadsheet.

The device connects to the parallel port via a double-ended socket into which you can plug a printer: a hotkey allows you to toggle between the two connections. It draws power from the keyboard via an adaptor socket; alternatively, you can fit a battery pack for use with portables.

The DataPen's largest market is likely to be in niche applications, especially those involving a narrow range of type styles that the DataPen can be trained to read. This is largely because the manufacturer, Primax, has priced it at £248 — far too expensive for the mass market. Which is a pity, because at the right price the DataPen could create its own market; and if everyone had one, designers might start printing contact details in text designed for machines to read.

That would be no small thing: used on Net addresses, devices like the DataPen can provide the "missing link" between paper and the World Wide Web.

### PCW Verdict

Useful, though not so much as you might wish, and priced too high for its own good.

Price £248

Contact Primax 01865 744346

Fax 01865 751256



The pen of the future?  
Maybe...

## Hardware

## NEC MultiSync MTg Data Projector

One of the new breed of LCD projectors, this stylish machine is guaranteed to make presentations persuasive, games exciting, and films downright brilliant. Next time Gordon Laing finds £8,995 in the street, this is what it's going on.

One of the really nice things about working for (and, we hope, reading) PCW, is the huge variety of products it covers. Not just your hardware group tests and software round-ups common to other titles. I would say "take this NEC video projector for instance", except had

there been any opportunity to take it, you wouldn't have seen me for dust. Why? Because I can sincerely say, with my hand on my heart, that the NEC MultiSync MTg data projector is the single most desirable piece of kit I have ever laid my hands on. But I'll hold back on

the superlatives for a moment, calm down, and get on with the technical stuff.

A data projector does for video what a film projector does for celluloid: it takes a small moving image and enlarges it onto a distant screen with a bright light and lens. If you want to give a computer presentation, or watch videos on the big screen you have two basic choices: go for a huge television box or a data projector.

The former has the advantage of being a single-box solution. Large-screen boxes using glass tubes are available at a maximum of around 34in, while rear-projection sets become rare above 50in. This may sound like a big screen, but sit more than a few metres away, or in a large room with several heads bobbing up and down, and you'll soon find yourself



yearning for more.

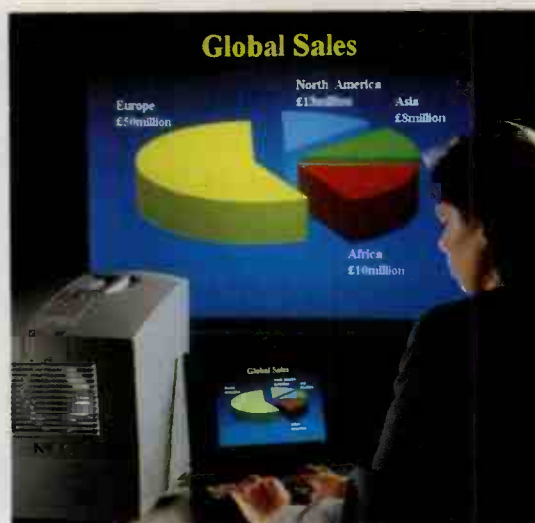
The advantage of a data projector is a relatively small and sometimes portable box, the possibility of a fold-away screen, and an image of truly cinematic proportions. Data projectors fall into two main camps: those which form the image with separate red, green and blue CRTs, and those which use one combined full-colour LCD panel or three separate LCD panels.

The trouble with CRT projectors is that each of the three primary-coloured tubes must be focused separately to avoid undesirable coloured fringes. This convergence process can take some time, resulting in many CRT projectors being permanently installed in an undisturbed location such as a ceiling. On the up side, CRTs are an established technology offering either relatively low prices or unequalled specification.

LCD projectors work very similarly to slide projectors. A small LCD panel is mounted with a bright light and diffuser on one side and a single projection lens on the other. With only one lens there are no convergence worries — you just switch it on and focus the image on the screen. However, the resolution is fixed, the quality not always so great, and if you look too closely you'll notice the thin black grid around the matrix of dots.

NEC's latest pair of LCD data projectors, the MultiSync GT (graphics theatre) and MTg (multimedia theatre) have addressed any earlier quality concerns. The GT is an extremely impressive high-end unit, offering a maximum resolution of 1280 x 1024 pixels with three 4.2in LCD panels, and costing in the region of a somewhat frightening £75,000. The lower-specified MTg, reviewed here, comes in at a far more reasonable-sounding £8,995. Costs are kept down by using a single 3in active colour TFT LCD panel, offering a maximum resolution of 640 x 480 pixels in 24-bit true colour.

Both projectors boast NEC's new LightGate technology, which provides much more uniform illumination from edge to edge. All LCD projectors polarise the light from the bulb for illumination, but inefficiencies in this process result in a dramatic fall-off in light output towards the edges. LightGate technology uses prisms to recover scattered light and direct it to the edges. While it's not perfect, the central area is only noticeable as being a tad brighter on completely plain images of solid colour.



NEC's MultiSync MTg — "There is none higher."

At just over 36lbs with a convenient carrying handle and measuring roughly 11 x 15 x 21in (WHD), the MTg really is portable. I lugged it around VNU House showing it off, before sticking it in the boot of a car and driving it home. And it looks brilliant too, all gentle curves and finished in pure white, not dissimilar to Apple hardware.

Installation is an absolute breeze. Just sit the unit on a low table, connect the power and a video source, then focus and zoom the lens as desired; I had it up and running in less than five minutes. An optional ceiling mount is available. Remember that since this is not a CRT, there are no geometric distortion controls: if the image is suffering from trapezoid, make sure the focal plane of the lens is square to the screen. You certainly won't have any convergence problems or barrel distortion unless the screen is curved.

A detachable infra-red remote control offers on-screen adjustment of brightness, contrast, colour, tint, sharpness and volume of the small, built-in 1.2W speaker. The image may be flipped vertically or horizontally in case the unit is ceiling-mounted or rear-projecting behind the screen. The remote may also be used to switch between composite video (PAL and NTSC) and two RGB sources (BNCs or Mac or PC D-SUBs). The 30MHz bandwidth offers an RGB resolution of 640 x 480 pixels and video resolution of 500 lines.

The bright 250W metal halide lamp in combination with the standard 105-605mm f5.0 zoom lens can produce an image diagonal size of between 40 and 150in. I used the MTg at its minimum focusing distance of 1.9m (6.23 feet)

which, with the zoom at its widest position, produced an image with a diagonal of just over 60in. I projected onto plain, matt white card which was stuck to a wall, and it performed quite adequately. Like all projectors the best results were found in complete darkness, although acceptable images are possible with a little ambient lighting. Using a proper projection screen would be best.

I've used several video projectors and like many people have witnessed countless presentations made with them. The first thing I noticed with the MTg is its ease of use in setting up. This is common to all LCD projectors, but in the past, most have been very low resolution and with poor uniformity. The heavily touted LightGate technology along with true 640 x 480 resolution cleared up both concerns.

The bandwidth is only sufficient for VGA but in Windows this looked fine for almost any application. Switching to games under DOS was an extraordinary experience. The vibrancy of the colours in Doom, Descent and X-Wing had to be seen to be believed. Perhaps most surprisingly of all was the MTg's NTSC and PAL performance. Even the limited number of lines on a 2.35:1 ratio widescreen laserdisc was perfectly watchable, enlarged to 60in and viewed eight feet away.

CRT projectors may be cheaper in some cases, and usually higher quality, but LCDs are catching up and they've already overtaken and accelerated far into the distance in the convenience stakes. The NEC MTg is consequently the only decent projector which is truly transportable, but to condemn it to exclusively portable presentations would be a shame. This is a unit you would be proud to leave set up in the board room for truly persuasive presentations. I would, however, recommend a Doom session as soon as the audience has left, and then taking the unit home where they can reconvene for the feature film.

### PCW Verdict

The convenience and ease of use of LCD is still there but now with superb image quality. The NEC MultiSync MTg is perfectly transportable but more than good enough for a fixed computer presentation, and equally at home with composite video. Absolutely fabulous.

Price £8,995

Contact NEC Peripherals 0181 993 8111, Fax 0181 992 7161



## Software

## SpinRite 3.1

Here's a new version, with new code, of the insurance against hard and floppy disk disasters. Don't wait until your computer packs up to buy it, recommends Paul Begg.

Okay, so you're dissatisfied with your computer, your spreadsheet has all the functionality of a tree and the super-duper word processors you see in the magazines are only to be read about and envied. But just imagine what it would be like if you turned on your computer and... nothing happened. Imagine if you couldn't access your spreadsheet or word processor at all.

This happened to me only last week. I'd fitted a scanner card and dislodged some thingy which simply had to be pushed back into place. But the best part of a day had passed while I fiddled and fumed, eventually throwing my pride to the wind and phoning the local computer shop for help. The experience brought home to me — again — the importance of regular backups and running regular diagnostic checks.

One thing you will almost certainly have experienced already is your machine being unable to "read" a floppy disk. If you re-inserted the disk and pressed Retry a few times, did the floppy suddenly work? If it did you have seen the theory behind SpinRite in action. The difference is that SpinRite works with your hard disk as well as floppies.

Now, I can't claim to be an expert in these matters and I suspect that Gibson Associates anticipated few reviewers would fully grasp the intricacies of their product, which is why they supplied us with a little booklet called *What's Under The Hood*. It isn't what you'd call light reading but it explains how sometimes an

unreadable sector, be it on hard or floppy disk, can be read by delivering a firm bang with the palm of your hand on the side of the computer. Of course, such tactics would probably do other damage and isn't to be recommended. Which is where SpinRite 3.1 comes in: it represents the palm of your hand.

First, SpinRite keeps trying and retrying to read the sector. Just as with a floppy, this trying sometimes wears down the sector's will to resist. If SpinRite gets just one good read, that's all you'll need to recover your data completely because the data will not be read back to the problem sector.

If this fails to work, SpinRite wiggles the drive's heads. According to *What's Under The Hood*, this allows compensation "for the long-term alignment drift that occurs in non-servo based drives, and the positioner hysteresis that occurs in servo-based designs".

Of course it does. Clear as day, *n'est-ce pas?* What this wiggling actually does is cause lots of different bits of the faulty sector to be read. One of those bits might be the key to reading the whole sector.

If the wiggling doesn't work, the third weapon in the armoury is brought into play. While SpinRite has been trying and retrying to read the disk and excitedly wiggling the drive's heads, it has been saving all the bits of data it's read. Sometimes it has collected all the lost data, sometimes only some of it.

Some of it! What good is some of it? Well, as Steve Gibson explained: "If the

bad sector was part of a partition's file allocation table, a few lost bytes would probably damage the structure of just one file. But losing the entire sector would confuse 256 clusters and all the files containing them."

But dragging data back from the very jaws of oblivion is only part of what SpinRite does. In fact, this bit is done by the DynaStat Data Recovery module. SpinRite also looks after disk defects. It does this even with IDE and SCSI drives, apparently described by some "experts" as unrepairable.

SpinRite incorporates a benchmarking module, but even this is different in that it incorporates a whole new measure of drive performance. Called Sector Access Velocity (SAV) it measures the "seek to the data" performance — a megabyte per second measurement that closely tracks the drive's perceived performance.

SpinRite has been around for about seven years but was getting a little long in the tooth. Gibson Research decided against tacking on a module here and there, instead scrapping the code and starting afresh. The program runs from DOS and needs total control of your machine, so it must be loaded from a clean boot. So, you can't have any other programs running, not even disk cacheing. This caused a problem for me and I received a message telling me Gibson Associates had never encountered a configuration like mine and they'd love to know more about it. Flattering as it was to be considered unique, it delayed my evaluation of SpinRite.

This problem aside, SpinRite was easy to install, took overnight to run a battery of tests and was easy to use. It ran transparently with DoubleSpace, Stacker and SuperStor partition compression, and produced a detailed log.

For a single floppy disk which you won't be using on a daily basis, SpinRite 3.1 seems unjustifiably expensive at £129, but no price will seem too high on the day you have a hard disk problem and your data vanishes.

SpinRite Detailed Technical Log generated at 1:13 pm on Jan 25th, 1995.

SpinRite 3.1 (serial number: E8332447) (c) Gibson Research Corporation.

|  |                                  |
|--|----------------------------------|
| Partition C: with 245 megabyte capacity on the 1st physical drive. |                                  |
| 14 : heads   | Yes : drive caches reads         |
| 35 : sectors   | No : caches avoidable            |
| 977 : cylinders  | --- : revolutions per minute     |
| 244,858 : total megabytes  | --- : physical intersector angle |
| F000 hex : bios entry segment                                      | --- : sector interleave          |
| 1st hard : bios drive  | --- : extreme sector translation |
| Hardware : interaction method                                      | --- : zone bit recording         |
| No : identify drive cmd  | --- : has engineering cylinder   |
| Yes : retry suppression  | --- : drive caches writes        |
| No : cache disable cmd   | --- : subtle sector translation  |
| Yes : drive diagnostics  | --- : miscellaneous anomalies    |
| unknown : ecc data available                                       | Yes : "dynastat" data recovery   |

SpinRite —  
a good cure  
for those  
hard disk  
blues

## PCW Verdict

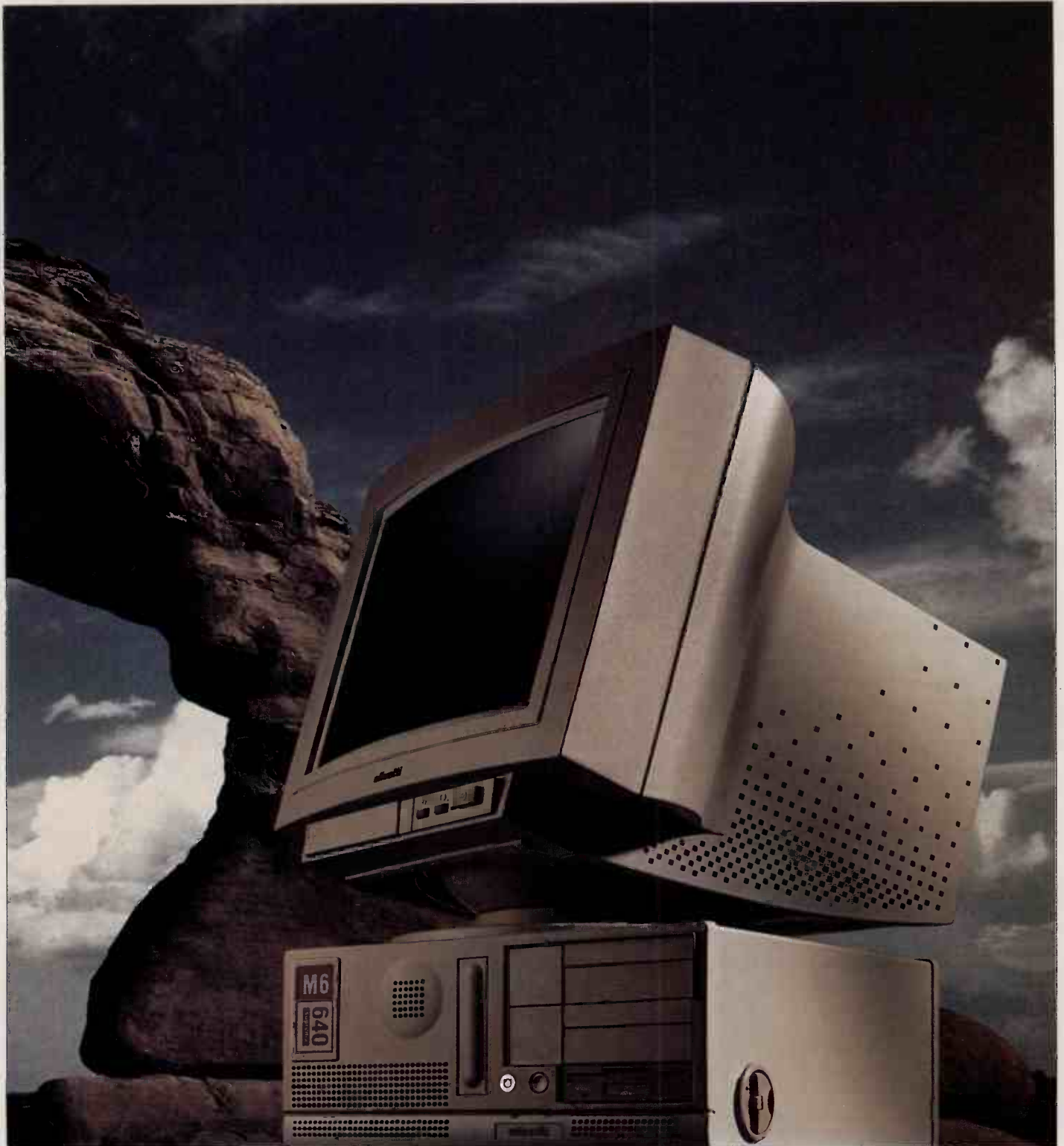
In the corporate environment, probably a wise and economical insurance against hard disk disaster. Otherwise, cost has to be weighed against the value of the data lost if your hard disk crashes.

Price £129

Contact Computers Plus 0181 952 1389,  
Fax 0181 951 3868



# Olivetti Suprema. Before choosing any other PC, count to ten.



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## 3 PERSONAL COMPUTER WORLD - JANUARY 1995.

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### Hardware

## Orchid SoundWave 32

**Chris Preston was spared the trauma of a messy multimedia installation by his SoundWave 32 card, which coped admirably and continues to give sterling service.**

I recently celebrated my SoundWave 32's first birthday by listening simultaneously to the Carpenters on CD-Audio, a MIDI rendition of Another One Bites The Dust, and an Amiga MOD version of that classic rock-and-roll anthem, Popcorn. The whole was definitely less than the sum of its parts, but the sound card coped admirably.

At the time I purchased the card, it seemed the most elegant solution to the multimedia problem. It supported all the important standards, including Sound Blaster, General MIDI and even Microsoft's Windows Sound System, plus it had connectors for all the major CD-ROM devices of the time. This would be less important if I were buying now, since most drives use IDE or SCSI interfaces; but back in the dark days of early 1994 I felt it vital to have Panasonic, Sony and

Mitsumi options — just in case.

When I finally came to add a Sony CD-ROM a few months later, I encountered surprisingly few problems. I had heard terrible tales of woe from colleagues concerning multimedia installations, but I was spared. The trickiest part was letting the sound card know that I wanted it to control the CD-ROM, but this was simply a matter of loading Orchid's own driver before installation. Whether this indicates the SoundWave's ease of use, my knowledge of my DIY PC, or a sudden cessation of wing-flapping by antipodean butterflies, I cannot say. I suspect it was a combination of all three.

One of the best features of the SoundWave 32 is its ability to emulate multiple sound standards simultaneously. This means I can play Doom with SoundBlaster samples and General MIDI music. I'm sure there are sound cards that can do a better job, but this is more than scary enough for me. My only gripe would be that it is often impossible to get DOS games to take advantage of the card's higher sampling rates and stereo sound. While most games support SB Pro or even SB 16 standards, very few can be convinced of the SoundWave's ability to match these. However, the standard SoundBlaster emulation is excellent, and I have yet to find a game that is not convinced.

If I were buying now, my choice would be between a SoundBlaster 16, AWE-32 and the SoundWave 32. The SB 16 is only slightly cheaper but lacks wave table synthesis, and the AWE-32 is more expensive. I could use the extra money to buy a SoundWave 32+ and get the benefits of SCSI.



One of the best features of the SoundWave 32 is its ability to emulate multiple sound standards simultaneously

1 YEAR  
TEST

### PCW Verdict

An excellent card that will meet my needs for some time to come.

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## Software

# Resedit 2.1

**Paul Magee is a devotee of this handy little utility which, once you've mastered it, can bring much pleasure to Mac programming.**

**2 YEARS  
TEST**

**R**esedit can strike fear into the heart of many a Mac user: tales abound of system crashes and data loss following a little experimentation with the program. For its devotees, however, this handy utility can become the most essential item to reside on your disk — the ultimate system hacker's tool.

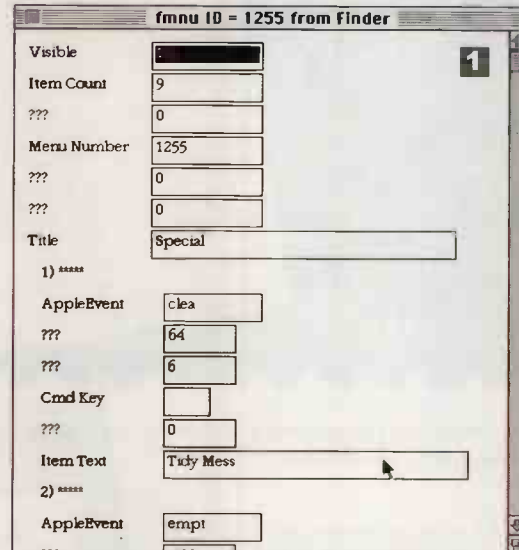
What exactly does Resedit do? Well, many things. At its heart, Resedit can open any application and allow you to explore and change the various parts inside. These parts, or Resources as they are properly known, are split into a number of different types and contain things like the contents of menus, dialogue boxes and so on.

Each resource has its own unique i.d. number, and when a program needs to display one it opens the box of resources, pulls out the item matching the number it wants and puts it on the screen. The real beauty of this system lies in the fact that the application doesn't care about the contents of the resource; it just needs the structure to be correct.

For example, when the System displays the icon for a folder, as long as the i.d. number is correct and it measures 32 x 32 pixels, the contents are irrelevant. The same applies to menu titles, text in dialogue boxes and the shape of your trash can.

This is where Resedit comes to the fore for system hackers. With a little effort you can have your trash can look like a PC, alert messages that display the Simpsons (in full colour) instead of the boring exclamation mark, or weird and wonderful balloon helps (with pictures) attached to all your custom icons. But Resedit is also the programmer's tool: it's used for designing splash screens, windows and icons for any program under development. It also implements

## Mac programming made appealing

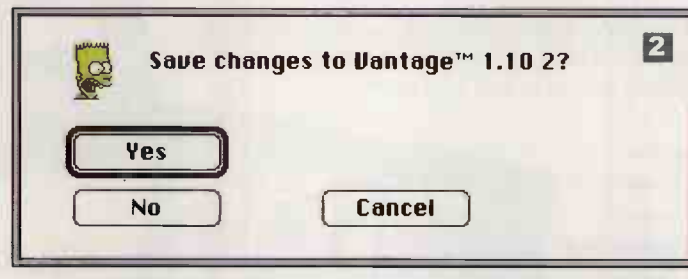


**1** Templates allow you to define structures to handle your data

don't come with a native editor (although this is available as an add-on). The "Font" editor is a redundant item and should be removed from the application, if only to prevent amateur font design. If this is your leaning then I recommend an investment in Altsys Fontographer.

Another annoying feature is more fundamental and lies with the program interface itself: if you have two or more apps "opened" by Resedit, the screen soon becomes cluttered with windows, almost to the point of counter-productivity.

Because Resedit is designed and distributed free by Apple, it is not such a commercial product, so Apple is less responsive to its users on updates and improvements. Third-party manufacture capitalises on this and is capable of delivering a product that is far superior in many aspects. Mathemaesthetics Resor-



the interface — that is, the look and feel — of any application.

On top of this, it's an application that's expandable. Template design is a powerful feature that enables you to implement a structure to display raw hex code in an orderly fashion. A template consists of a form with labels to describe the relevant data types, and a field to display the result. This allows the programmer a more efficient way to handle his resources; instead of trawling through endless streams of hex, he merely has to fill out a form.

More powerful again is the ability to construct resource editors of your own (akin to the FatBits pixel editor). Writing these separately in something such as Microsoft Programmers Workshop (MPW), the new editor is "bolted on" to Resedit itself, thus enlarging its scope.

It's at this stage that some of Resedit's shortcomings creep to the surface. For example, "Code" resources

cerer is the best example. It's a much larger application that provides a more intelligent interface combined with superior template design and a C starter code generator, and generally delivers a more comprehensive and flexible resource design environment.

But despite this, Resedit is still there, the alias on my desktop. Although there are bigger and better out there, it still has an appeal that draws you back. It embodies something of the Apple ethic: its designers are saying, "Look, here's our system and here are the tools to change it as you please." So you sit, explore and learn, but most of all you follow that ethic — and enjoy. Highly recommended.

### PCWVerdict

An undoubted appeal for Mac programmers.

Details ResEdit is available to programmers from Apple's APDA Catalogue, part number M0910LL/C. Tel: 0101 716 871 6555



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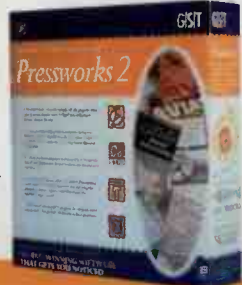
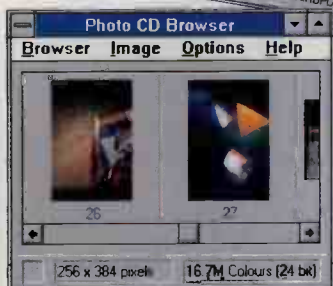
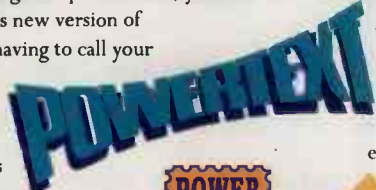
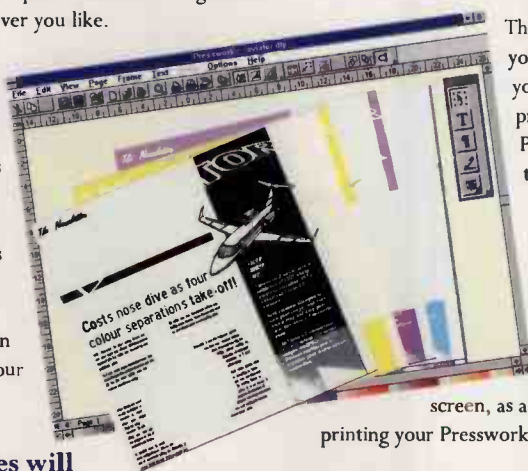
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120MHz PENTIUMS

# Fast and Furious

Fast, powerful and well-equipped, these are undoubtedly the Linford Christies of the PC world. Gateway and Viglen are among the first to use the 120MHz Pentium and their machines don't just lap the competition, they're superbly built too. Karl Dunkerley witnessed the two fastest PCs we have ever seen.

GATEWAY & VIGLEN: SPEED FREAKS



PC Photography by David Whyte





**“**I feel the need, the need for speed!” cries Tom Cruise in *Top Gun* before blasting off in his state-of-the-art jet fighter. It's the same feeling that will tempt you away from a 486 and into buying one of the latest Pentium models from Gateway and Viglen. They are both serious speed merchants, thanks to their 120MHz Pentiums and excellently matched components. Who says the x86 family is dead?

There is always a rush to release new models based on the latest chip and often the first turn out to be the worst. Probably the most reassuring aspect of this clash of Titans is how mature the two products look and feel. These machines run at over 24 times the clock speed of the original 4.77MHz IBM PC, with 256 times more memory and the kind of performance and graphics capability the original PC designers wouldn't have believed possible. Even a 10Mb hard disk was prohibitively expensive when the IBM PC shipped, yet the Gateway arrives

with a 2Gb disk drive squeezed into a 3.5in drive bay.

Although there are significant differences between the two machines reviewed here, let's start with the similarities. Both have three ISA and four PCI slots, giving six in total: the two adjacent ISA and PCI slots cannot be used simultaneously. Unlike older designs both motherboards are free of jumpers. All configuration of slots, and so on, is done through the BIOS and stored in CMOS. Compared with the horrendously complicated setups of old, the AMI BIOS is simple yet flexible, although some knowledge of PCI is advisable if you intend to alter the advanced settings. And although 256kb of processor cache is standard on the boards, the BIOS allows for the new EDO RAM that reduces the need for cacheing. Small and neat best sums up both motherboard designs.

All input/output is controlled from the motherboards with built-in parallel, serial and Enhanced IDE controllers, although the Gateway uses a SCSI hard disk instead. E-IDE allows for up to four devices including CD-ROMs, and for much higher data transfer rates than with

standard IDE. The old limit of 540Mb per drive has been extended to 9Gb, proving there is plenty of life left in the old technology and making E-IDE a useful low-cost alternative to SCSI.

Both machines use their PCI slots for graphics cards, which allows the card, processor and memory to communicate at extremely high speeds. Redraw speeds are astonishing even with large, detailed graphics; even better, full colour is available at high resolution thanks to plenty of on-board memory. Both machines arrived with full multimedia including quad-speed CD-ROM, sound cards and speakers.

### Gateway P5-120 Elite

The Gateway arrived in an impressive ivory tower case, perhaps to drive home the impression of speed and power. Towers are bulky, but for removing components or cramming peripherals inside the box there is nothing to beat them. The 300W power supply will happily support anything you put in the nine bays, and there is plenty of space although the cabling could be tidied up. Four 72-pin SIMMs allow plenty of RAM expansion to



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handle big spreadsheets and images, and the standard configuration is 16Mb.

The 120MHz Pentium has a large heatsink attached to it and a fan blows air across this into the roomy void. Overheating should never be a problem. Three of the slots are occupied, the first with the PCI SCSI card which controls the CD-ROM and the massive 2Gb drive. This is a significant departure from the Viglen design which goes for Enhanced IDE.

Another PCI slot is occupied by the ATI Mach64 graphics card. Problems were encountered with this, although they turned out to be largely the fault of badly installed drivers (this was a pre-shipping model). When installed properly, the card ran quickly and gave good colour depth thanks to 2Mb VRAM. It even ships with

drivers to accelerate playback of digital video AVI files.

The Vivitron 1776 monitor is good but pales next to the Viglen, and there was a slight adjustment problem in the top left corner. The control panel is comprehensive and you can use the full width of the screen. Mach64 has a fast-switching utility between resolutions and colour depths, eliminating the need to reboot Windows. The graphics element was good but not

● A heatsink and three fans in total make the Viglen Genie P5-120 a really cool machine

spectacular.

Gateway's generous software bundle includes Encarta 95, QAPLus, Microsoft Office 4.3 (on CD) and a host of extras. The audio software is no great shakes, which is a shame as the speaker system is by Altec Lansing and includes a huge sub-woofer which dwarfs the speakers. Cables run everywhere, but the sound is hard to fault.

The CD-ROM drive is an unusual creature, one we have not seen before. This SCSI device has a three-disc cartridge and each disc is recognised as a separate drive. These default to D:, E: and F: which was a problem for me as they clash with standard local and network drive settings, so I changed them to G:, H: and I: in the Autoexec.bat. Another hitch was getting the drives to recognise discs until I realised they went in shiny side up. For anyone using several CDs frequently, this is a great addition to a real tower of power.

● The number of bays in the Gateway P5-120 will satisfy even the most expansive power-user

## 120MHz Pentium PCs: overall results



Manufacturer and Model

Totals in real values

|                | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |     |
|----------------|---|---|---|---|---|---|---|---|-----|
| Viglen P5-120  |   |   |   |   |   |   |   |   | 6.7 |
| Gateway P5-120 |   |   |   |   |   |   |   |   | 6.8 |
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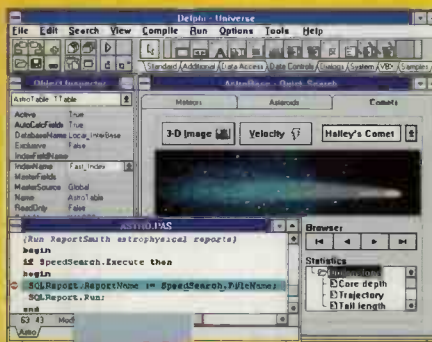
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### Viglen Genie PCI Professional P5/120

This too comes in a hefty box which isn't as aesthetically pleasing as the Gateway but, being a mini-tower, it doesn't take up quite as much room. Even so, it allows three 5.25in and four 3.5in devices to be installed comfortably. Inside, the review machine looked more like a production model than the Gateway did and the cabling was secured properly.

The keyboard and mouse use standard connectors rather than the Gateway's PS/2 links. Again, four 72-pin SIMMs are available and currently filled with four 4Mb modules.

Three fans should ensure the chip stays cool: one on top of the Pentium, one on the PSU and the other at the front of the case. Using the on-board E-IDE connectors for the CD-ROM and hard disk frees up more slots. The CD-ROM drive is a quad-speed Toshiba XM5302B and the hard disk is a 1Gb Seagate. The disk is on the primary controller and the CD on the secondary, so the slower speed of the latter should not interfere with the former. A PCI slot is used for the Diamond Stealth64 card. Clashes with some network cards over memory can occur, but this card is generally highly regarded and it won second place in this month's graphics cards group test [page 390]. The drivers work fine and the

screen redraw is very fast.

The monitor is what makes the Viglen really stand out. Appropriately named the Envy 17PE, its colours are deep, the image stable and even text appears pin-sharp. This is clearly a professional monitor. One giveaway is that the rear has five inputs which split each part of the signal down into its components; normal monitors combine the signal, thereby sacrificing clarity. The front panel allows a high degree of control over the image size and position, with a White Light switch which swaps between a white background of either 6,500 or 9,300 Kelvin. In practice, this is the difference between a warm, soft white and a cool, harsh one. Colour-critical tasks are best performed at 9,300K (like a bright tube light) while 6,500K is generally more relaxing for prolonged use. This monitor is a real pleasure to use.

The multimedia side will be more than adequate for most people as it couples the Creative Labs SB16 card with Creative Labs speakers — good, but not outstanding.

### Conclusion

There's little to choose between these two speed demons. Each is excellent in its own way with well integrated components: there are no obvious faults. It all comes down to what you want to do. The

Gateway's huge hard disk is ideal for mega-database applications and as a server. The Viglen is better suited to heavy image-based work thanks to its graphics card and monitor combo.

The Genie also did slightly better at rendering a three-dimensional video animation using 3D F/X. As this extremely demanding task relies almost entirely on the processor and graphics card, Viglen has obviously optimised its system better. However, the overall difference is small: the Gateway takes 28 minutes compared with the Viglen's 25 (my Genie P5/90 takes 37 minutes, proving processor speed can make a real difference). This was borne out by the Euromark component benchmark tests, although the VNU European Labs application-based tests gave a slightly higher overall figure for the Gateway; see the graph on page 374.

So, if you want lots of storage and a triple-disc CD-ROM, go for Gateway. For general-purpose and graphics use, it's the Viglen every time.

PCW

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### The Intel Pentium 120

The 120MHz Pentium is faster, but is it better? Intel uses its own iCOMP index to give an idea of processor performance: a 66MHz Pentium has an iCOMP rating of 567, a Pentium 100 scores 815 and the 120 hits 1,000. But a nominal speed increase of 20 percent should give an iCOMP of 978, which means other improvements have been made as well.

Part of the answer lies, ironically, in the use of a slower bus speed. The 60MHz bus operates at exactly half the frequency of the 120MHz Pentium, which means that the new chip can run with zero wait states. The 100MHz chip, which runs with a 66MHz bus, needs one wait state.

An additional improvement comes from the die size being substantially reduced to 0.35 microns, even though the same four-layer process as the 75, 90 and 100MHz chips is used. With processors, smaller is better — smaller chips mean a higher yield from each 8in silicon wafer. The 120MHz Pentium is the first Intel chip to use the new process in its Oregon-based factory.

The small die size does cause timing problems for dual-processor systems, but this only affects systems which exploit the MESI shared cache system offered by all Pentiums. Though this is a minor problem in the general scheme of things, it means that anyone needing a multi-processor system may be better off waiting for the P6. A more

significant problem is that the new chip runs at 3.45v yet motherboards generally run at 3.3v. The result is that motherboards have to have the voltage stepped, although the design of the chip ensures this will not affect its long-term reliability.

The 0.35-micron process used in the 120MHz chips is the same that Intel will use for the P6, which will also be made as a 0.6-micron chip. This gives the P6 program a chance to try the new process on something more simple before using the new chip on the process.

The new chip has a 296-pin Staggered Pin Grid Array (SPGA) package, and will plug into the Type 5 socket used by 90MHz machines and a new Type 7 socket. Extra voltage and dual-processor problems notwithstanding, it should be easy to upgrade a 90MHz machine. It won't be sold as an overdrive for the 90MHz chip because Intel only sells overdrives which are 50 percent faster than the original, and the 120MHz isn't that quick. There will be an overdrive for Pentiums, and for the DX4 (a two-chip package), but this is not it.

Cooling should not be a problem since the 120MHz chip is roughly equivalent to a 200MHz one, but since a future version of the 120MHz might use 0.6-micron processes it is specced to 20 percent more heat than a Pentium 100. Bear in mind that this is still significantly cooler than the original 60MHz chips.

The biggest effect of the new chip will be on prices. Until now, the 100MHz has been high-end and very expensive. The introduction of the 120MHz chip now, with 133MHz and 150MHz to follow, will push down the prices of 100MHz Pentiums.

Simon Rockman







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# Going for gold



Two camps are out to set the universal standard for high-density CD. In one corner we have Sony and Philips with Golden Book; in the other, a fearsome conglomerate of other electronics giants backed by Time Warner. But with a bit of luck, reports Tim Frost, the two sides might just agree to a compromise.

**J**ust when things seemed to be stabilising with the different CD-ROM, CD-Video and CD-Audio formats, the market has been turned upside down again with two different High Density CD proposals.

The need for HDCD is becoming increasingly apparent. Today, a standard CD-ROM holds around 650Mb of data which can be in various forms, from audio to movies, from text to programs. Although it is unlikely that even Windows 95 will need program sizes exceeding the 650Mb barrier set by standard CD, the enthusiasm for adding in disc-consuming images, audio and video clips soon fills a CD to bursting. As a speaker at a recent HDCD conference noted about how quickly software companies find ways to fill a CD-ROM, "eating just makes for more hunger". The other driving force behind the need for HDCD is the use of CD as an alternative to VHS video tape, for video movies.

Although Video-CD has already achieved a reasonable uptake in the UK and Europe, it is virtually non-existent in the US and Japan. The reasons for this are complex. The obvious ones are that



Philips has considerable more marketing clout in Europe than in the US and Japan. In addition, the Hollywood movie companies are less than happy with the MPEG1 video encoding standard used on Video-CD. This is linked to the fact that as each disc has a playing time of only 74 minutes, two discs are needed per movie, sometimes three, with the additional manufacturing costs entailed and the enforced pause between discs. In the ideal world, the movie moguls argue, they want a CD that provides LaserDisc-quality video with a complete movie on a single disc.

This means high-density CD of some variety with at least five times the capacity of the existing disc. What that disc is exactly going to be like is now opening up as a major discussion point.

But while two giant consortiums size each other up — the guardians of CD, Sony and Philips (with a little assistance from IBM and Microsoft) in one corner and the mega-electronics grouping of Hitachi, Pioneer, Toshiba, Denon, Mitsubishi and Matsushita (Panasonic/Technics) with the able assistance of the Time/Warner media empire on the other — let's first look ahead at how HDCD will hopefully at least sort out some of the "book" mess that has developed around standard CD.

### Hi ho, silver disc

It's worth remembering that the compact disc and PC came on to the market around the same time, in the early eighties. Just as no-one predicted how universal desktop PCs would become in the ensuing 14 years, Philips and Sony, who had pooled their resources to develop the CD, had no idea about the diversity of uses their 5in silver baby would be put to. They had a feeling that as a digital data medium it would be used as a computer storage system. But with 650Mb of capacity at a time when few desktop PCs even had a hard disk, it is hardly surprising that they wouldn't have considered it as a consumer or office format.

The first move to a computer-based CD format was made in 1985 when the Yellow Book CD-ROM standard was published, and then updated with the High Sierra Application format (otherwise known as ISO9660) in 1988. Putting aside recordable CD, the next development to impact on the CD was the first step into multimedia with Philips' own CD-i standard, the Green Book, in 1989. But it was the multimedia applications that then showed up the inevitable flaw in



the way the standards had been allowed to develop down separate tracks. While music and computing remained mutually exclusive activities, there was no problem with creating one CD file standard for audio discs and a different one for data. You only run into problems when you want the one disc to do both.

As a quick fix, as recently as 1991 the CD-ROM-XA standard was established, which created a file format that could bridge between the different applications. But the inheritance of the apartheid between audio-visual and computing developments keeps rearing its head. There has been Photo-CD which brought in the problems of multisession and non-multisession discs, and White Book Video-CD with its mode2/form2 problems. Now, in the last couple of months, there has been the announcement of CD+, another crafty quick-fix to put audio and data onto a single disc that will play on both hi-fi and computer.

*The Philips/Sony proposal for HDCD should allow the new discs to be manufactured at existing plants with little or no modification*

Here is where HDCD will have the biggest effect on stabilising CD as a distribution format to move into the next century. HDCD is seen as an opportunity for a *tabula rasa* — a clean sheet — in developing a new file structure for CD. Instead of a range of different colour books, each integrating different applications and fixes to attempt to talk to one another, the new Golden Book standard will try to integrate them all into a universally readable format.

### A four-level standard

Instead of producing a single HDCD definition, the standard has been broken down into a hierarchy of four levels. On the base level are the physical standards:



# You can always tell the true

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# Road Warrior



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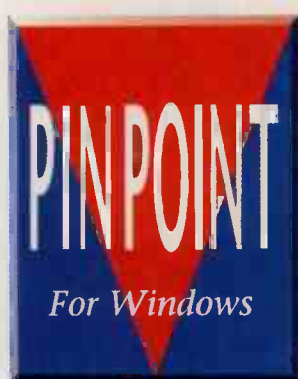


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how big the disc should be, how long the pits should be, what wavelength laser light will be used to replay it... all the things that Sony/Philips and Toshiba/Matsushita are arguing about at the moment.

In the floppy-disk world, these physical standards relate to such things as the size and shape of the plastic shell and the magnetic characteristics of the disc inside the shell. The next layer is the data format, defining the conventions that allow reliable recording and replay off the disc; aspects such as the error-correction system are set in this level. This and the next level, the file format, are where the new HDCD standard can undo most of the conflicts that exist between the different applications of standard-density CDs.

It is reasonable to assume that the bulk of the applications for CD have now emerged. And although there is always the possibility of a few surprises in the future, further developments are likely to be variants on the data, program, stills image, audio or video uses that are being currently explored with standard-density CD. That understood, it is possible to redefine the data and file structure so that a single disc will be playable on all drives and the data can be reliably and accurately extracted by any drive. This leaves the problems of sorting out what the different types of data actually do, to the very end of the chain, by the applications level.

Where the other three layers are about moving towards a universal and transportable standard, the applications level is the one that encourages diversity. The main application areas are seen to be interactive games, data, publishing, interchange and video. Setting a separate standards level for the applications is not an attempt to unify them all together; rather, it's an attempt to control the use of resources such as user bits, so that no application treads on the electronic toes of another.

So, the HDCD Golden Book will end up defining a largely universally playable disc, where the differences lie mainly with

### Higher density: where the gains are achieved

The high-density CD extends existing CD technology rather than coming up with anything radically new. Because CD mastering equipment and CD pressing plants have become so much more sophisticated over the last decade, it is possible to work to much tighter tolerances than standard CD requires.

The two biggest gains are achieved by putting the data tracks closer together (reducing the track pitch) and making the optical dots that represent the digital information smaller. Introducing a more effective modulation system (EFM+) and a more powerful error-

correction (CIRC+) also plays a major part in the gains in data density on HDCD.

Finally, there is a slight increase in the area used for actually recording data on the disc.

#### Gains in data capacity compared with

|                                |               |
|--------------------------------|---------------|
| Standard CD closer track pitch | x 1.91        |
| Small optical dots             | x 1.85        |
| More efficient EFM/CIRC        | x 1.48        |
| Increased program area         | x 1.04        |
| <b>Total</b>                   | <b>x 5.44</b> |

the information content rather than the file and data structure. This brings us back to the two format proposals, which are remarkably similar. Both take the technology of the standard CD as a starting point and tighten up the specifications all the way down the line. Philips/Sony are looking to get 3.7Gb per layer, while Toshiba/Matsushita reckon on even tighter tolerances to get 5Gb per side.

#### Sorting out single and double

It is the "per layer" and "per side" that is the giveaway to the major difference between the two formats. While the Sony/Philips HDCD is a single-sided disc, just like a standard CD, Toshiba/Matsushita have gone for a double-sided disc. This is made by glueing two aluminium data surfaces together, back to back, and moulding them in the middle of the CD's clear polycarbonate surface. The HDCD player is likely to have a double-headed laser so that it can access both sides without physically having to turn the disc over.

Philips has responded to this double-sided doubling of the HDCD capacity by offering a multiple-layer option developed

by 3M, which places a semi-transparent data layer above the normal aluminium data layer. The HDCD player's laser can either focus on this middle layer and read off its data, or beam through it and read the information on the normal aluminium layer. Each layer will have a capacity of 3.7Gb and it is theoretically possible that up to eight layers could be put on a single disc, although double-layer discs would be the norm.

There are arguments in favour of both formats which can be rolled out to support either system. Certainly, the power of the Toshiba/Matsushita/Time Warner camp cannot be underestimated and the additional data capacity is of some benefit. The double-sided option is not welcomed by CD manufacturers as it introduces the sort of complexities that have kept the price of the double-sided LaserDisc so high. On the other hand, while the double-sided disc may be difficult to produce, the 3M system is unproved in commercial circles so no-one really knows how difficult it will be to make.

These arguments between the two systems may well turn out to be academic. Both sides are making a big display of marking out their territories, but by insisting that they are only bringing proposals to the table for discussion means they are leaving the door wide open for a compromise. This may well end up with a set of adjustments to both proposals, resulting in a common HDCD format under a Golden Book standard with double sides and multiple layers as options, and those all-important royalties shared between everyone.

PCW

### High density disc formats compared

|                    | Standard CD | Philips/Sony       | Toshiba           |
|--------------------|-------------|--------------------|-------------------|
| Disc diameter      | 120mm       | 120mm              | 120mm             |
| Disc thickness     | 1.2mm       | 1.2mm              | 2 x 0.6mm         |
| Memory capacity    | 650Mb       | 3.7Gb per layer    | 5Gb per side      |
| Running time MPEG2 | 20 mins     | 135 mins per layer | 140 mins per side |
| Track pitch        | 1.6µ        | 0.84µ              | 0.725µ            |
| Laser wavelength   | 780nm       | 635nm              | 635/650nm         |



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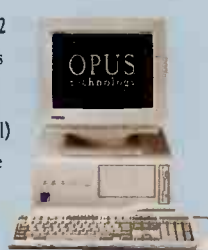
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PC User November 1994  
OPUS Pentium P54-90

*It performed very well in the tests and at this low price compared to some of the 486's, it can't be ignored.*

PC Power January 1995  
OPUS Pentium P60

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- 15" SVGA Colour Monitor, Full Scan with Power Management
- 1MB PCI Windows Accelerator Card
- MS DOS 6.22
- MS Windows 3.11
- MS Works
- LOGITECH Mouse (Serial)
- Desktop Case Style
- MS Office: Word 6, Excel 5, Powerpoint 4, MS Mail Licence
- 12 Months Parts and Labour Warranty



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- 3.5" (1.44MB) Floppy Disk Drive
- Dual speed Multi-session CD ROM
- 14" SVGA Colour Monitor, Full Scan with Power Management (.28 dot pitch) low emission, N.I (800x600)
- 1MB PCI Windows Accelerator Card
- 102 Key UK Keyboard
- MS DOS 6.22
- MS Windows 3.11
- MS Works
- LOGITECH Mouse (Serial)
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- Separate Stereo Speakers (15w)
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- 3.5" (1.44MB) Floppy Disk Drive
- 14" SVGA Colour Monitor, Full Scan with Power Management (.28 dot pitch) low emission, N.I (800x600)
- 1MB PCI Windows Accelerator Card
- 102 Key UK Keyboard
- Dual Speed, Multi-session CD ROM
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There is no doubt that the OPUS is a quality machine. It has been built to a specification rather than to a price – yet the price is a reasonable one.  
*Practical PC December 1994*  
**Prestige MPC P60**

**PRACTICAL PC**

In fact, of all the PC's I've used recently, the OPUS is by far the best equipped for multi-media applications.  
*Computer Shopper March 1995.*  
**OPUS Prestige MPC P60**

**COMPUTER SHOPPER**

A competent multi-media Pentium system at an affordable price.  
*PC Direct March 1995*  
**OPUS MPC P60**

**PC Direct**

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- 16 Bit Sound Card
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- 700MB Hard Disk Drive
- PCI Enhanced IDE Controller
- 3.5" (1.44MB) Floppy Disk Drive
- 15" SVGA Colour Monitor, Full Scan with Power Management (.28 dot pitch) low emission, N.I (800x600)
- 2MB Diamond Stealth Windows Accelerator Card
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- Dual Speed, Multi-session CD ROM
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- 3.5" (1.44MB) Floppy Disk Drive
- 14" SVGA Colour Monitor, Full Scan with Power Management (.28 dot pitch) low emission, N.I (800x600)
- 1MB PCI Windows Accelerator Card
- 102 Key UK Keyboard
- MS DOS 6.2
- MS Windows 3.11
- MS Works
- LOGITECH Mouse (Serial)
- Mini Tower Case Style
- 12 Months Parts and Labour Warranty



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Product Code: PREL 66 M

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Finance Example (PRESTIGE MPC P60 model)

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| Less 25% deposit                     | £385.95  |
| 10 Monthly payments                  | £115.80  |
| Total amount payable                 | £1543.95 |

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# Come the resolution

**Some say the only way to improve Windows is to get a Pentium. But a fast processor isn't everything: graphics performance is just as important. Chris Cain rounded up 15 PCI graphics cards and found that there aren't any jokers in this pack.**

**A**long with changing your hard disk, one of the biggest improvements you can make to a Windows PC is to upgrade the graphics card. Windows, after all, is a Graphical User Interface (GUI) and the more pixel power you have, the better it will perform. As well as providing extra speed, new hardware can allow you to work in higher resolutions, use more colours on screen simultaneously, and keep your eyes happy with a flicker-free display.

Graphics hardware has improved dramatically over the last two years, and prices have dropped to a point where powerful high-end products are affordable. You can now buy cards powered by full 64-bit graphic engines for under £150, with 2Mb or more on-board DRAM. Pay a little more and you can have a 128-bit device with up to 4Mb of fast dual-ported VRAM — essential for those high-resolution CorelDraw and Photoshop moments.

In addition, the success of Intel's fast Peripheral Component Interconnect (PCI) bus has had a big effect on the power of graphics cards. The performance is no longer hampered by the data bottlenecks imposed by older, less well designed buses. To explain exactly why, on page 404 Simon Rockman goes into

everything you wanted to know but were afraid to ask.

Other noteworthy boxouts in this group test include a look at resolutions and bit depths (page 400), and a report from the VNU European Labs on the design of the new Euromark 2.0 graphics tests (page 407).

Of course, the only problem with having all these products to choose from is working out which one is right for you. The tasks you perform every day will largely dictate where you need improvements, and you don't want to spend money on a card that only does half the job. If, for example, you do a lot of work with TrueType fonts, you'll more than likely want high resolutions and fast text redraws. On the other hand, someone set on exploring multimedia will want good software video playback and true-colour displays.

Over the next 10 pages we take a look at 15 PCI graphics cards, from top manufacturers such as Spea, Matrox, Orchid and Number 9. They range in price from just over £100 to almost £600 and we found that the performance difference was just as vast. Which one won the Editor's Choice? Which ones should you avoid? For the answers to these and other questions, read on...

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### Blue Dragon PCI

**D**esigned here in the UK, the Blue Dragon PCI is a new Weitek 9100 board from hardware distributor Eurotech. At £449 it's one of the more expensive products on test, but it does come in a single 4Mb VRAM configuration. It offers 24 bits per pixel at up to 1280 x 1024 and 65,536 colours at the top 1600 x 1200 resolution. It is let down in its highest display mode by a low refresh rate. Some might argue that this doesn't matter as only a few monitors support this resolution, but there's really no point in having it at all with a practically unusable refresh. This card also lacks the ability to be upgraded with a 9130 video co-processor.

The Blue Dragon PCW tested was a late beta, packed in a generic box without any documentation. The card is still available to buy, but Eurotech stresses that the drivers are standard Weitek editions and have not been fully optimised for this particular setup.

Despite a powerful engine, under the VNU European Labs benchtests the Blue Dragon turned in what could only be described as a poor performance. At 1024 x 768 pixels the speed was little short of appalling, and in higher bit depths the card couldn't compete with others here even at low resolutions. The results clearly showed that optimised drivers make a world of difference no matter how much RAM you have or the speed of the host PC.

Without bundled software utilities, a full manual and proper drivers, the Blue Dragon is something of a white elephant. Only time will tell if this a good product, and we may well test it again when everything is finished. But at the moment, it just isn't in the race.

#### PCW Details

##### Blue Dragon PCI

###### Good Points

Powerful engine.

###### Bad Points

Drivers don't use it properly.

**Conclusion** Wait for the finished version.

**Price** £449

**Contact** Eurotech  
01734 810011



### Cirrus Logic Alpine

**W**hen a product arrives in a small white box with no identity or instructions, it's difficult to know exactly what to expect from it. Such a product was the Alpine, a tiny card from Cirrus Logic powered by the company's own 5434 graphics controller.

At first glance the Alpine hardware doesn't look up to much: it's the smallest card on test and comes with 2Mb DRAM. The only other notable items are a VESA feature connector at the top and a Cirrus VGA BIOS. Not the most impressive design, but appearances can be deceptive. The Cirrus Logic 5434 at the heart of the Alpine is a fast 64-bit engine found increasingly on PC motherboards. It's the power behind Orchid's Kelvin 64VLB, which was Editor's Choice in our July 1994 group test, and in tests with optimised drivers the performance of this chip is something else.

Resolutions available range from 24-bit 640 x 480 pixels with 75Hz refresh, through to 1280 x 1024 with 256 at 60Hz or a horrible 87Hz interlaced. The most usable mode seems to be 1024 x 768 pixels at 72Hz with 16 bits per pixel.

Software supplied with the review model came on four disks and comprised drivers for Windows 3.1, Windows NT and OS/2 2.1, plus a DOS setup utility and patches for WordPerfect, WordStar and AutoCAD.

In tests the Alpine blew our socks off. It's outstanding at Windows text, making it ideal for word processing; it's quick in 24-bit modes, and achieved a greater overall video transaction per second rating than any other card. What's more, it only costs £129, making it outstanding value for money.

#### PCW Details

##### Cirrus Logic Alpine

**Good Points** Very fast, good value for money.

**Bad Points** 2Mb maximum, limited refresh and resolutions.

**Conclusion** Incredible value. Highly Commended.

**Price** £129

**Contact** Eurotech  
01734 810011



### Datapath Tornado VIP

**T**he Datapath Tornado is one of three products in this test with a Weitek chipset. Two versions are available, the Tornado and the Tornado VIP, the difference being an extra video accelerator chip and feature connector on the latter.

The Tornado boasts 4Mb VRAM and a top resolution of 1920 x 1080 pixels, specifically for use with Sony wide-screen 16:9 monitors. A more conventionally shaped 1280 x 1024 is available in 24 bits per pixel, and 1600 x 1200 can be displayed with 16-bit depth. The card's 220MHz IBM RAMDAC gives refresh rates of up to 80Hz at this resolution, and all other SVGA modes support high refresh rates too.

The additional video accelerator on the VIP is a Weitek P9130, which provides realtime scaling, dithering and pixel averaging to improve the performance of Video for Windows files. This works in much the same way as VideoLogic's PowerPlay, found on the excellent PCI Movie reviewed last month. A custom feature connector allows digital input directly to the co-processor.

Setting up was a breeze, with additional drivers provided for CAD, NT and OS/2. The display was sharp at all resolutions, and with runtime video software installed the co-processor lived up to expectations. The Tornado allowed 24-bit 320 x 240 pixel video clips to be rescaled to 1024 x 768 pixels with minimal blocking and no perceivable frame drop. The drivers are "Twindows"-ready, with the ability to drive more than one Tornado for multiscreen power setups.

The usual array of utilities to adjust monitor timings, resolution, cursor size etc is supplied. Nothing to make you gasp, but everything worked first time — it isn't often we can say that.

#### PCW Details

##### Datapath Tornado VIP

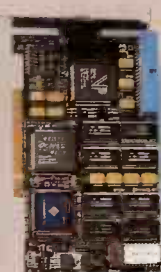
**Good Points** Easy to install, fast, high refresh, video acceleration.

**Bad Points** None to speak of.

**Conclusion** Goes like the wind.

**Price** £495; £549 with co-pro

**Contact** Datapath  
01332 294441







# DISCOVER THE SOUND SENSATION

Monday 23 January 1995

"Entertainment, MIDI and Business Audio, with beautiful, crystal-clear sounds? It must be the new SoundWave 32 Pro from Orchid" cried Henry. "Using Orchid's latest PRO ROMs, which combine wavetable and algorithmic synthesis, natural sounds like pianos and horns sound incredibly real, while sound effects keep their depth and vibrance."

Friday 27 January 1995

"Did you know you can now have sampling capabilities with a GameWave sound card?" I asked the Doctor. "That's right" he replied, "and now, you can not only record with Orchid's GameWave 32 Plus, but you also get the sensational sounds provided with their latest PRO ROMs."

Sunday 29 January 1995

It seems too good to be true - all the astounding features of a SoundWave 32+ SCSI bundled with the amazing Toshiba XM5201B triple-speed CD-ROM Drive. But then you realise that all this is included in Orchid's SoundWave SCSI Kit, as well as MIDIsoft's MIDI sequencer and MIDI cable. Such a diversity of features must surely be a gift from the Gods.

## SOUNDWAVE 32 PRO

- Compatible with leading audio standards
- Latest PRO ROMs
- 20Mhz DSP technology
- Bundled Software
- SCSI option available

## GAMEWAVE 32 PLUS

- Compatible with leading audio standards
- Latest PRO ROMs
- 20Mhz DSP technology

## SOUNDWAVE SCSI KIT

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- Toshiba XM5201B Triple-speed CD-ROM Drive
- MIDIsoft Recording Session
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### Diamond Stealth 64 VRAM PCI

**D**iamond's Stealth range have all been designed around acclaimed S3 processors. First was the Stealth 24, followed by the award-winning Stealth 32, and now we have the top-of-the-line Stealth 64. The version on test here is the Stealth 64 VRAM, but a cheaper, less specified DRAM model is available.

The Stealth 64 VRAM comes in 2Mb or 4Mb configurations and is based around the new S3 Vision968 engine. There's a VESA feature connector, a Texas Instruments RAMDAC, the Diamond BIOS and, on our unexpanded review model, four proprietary connectors for the extra memory module.

Software supplied consisted only of Windows 3.1, OS/2 2.1 and 3.0 drivers, but setting up proved easy and revealed a set of hidden tools in a Windows Control Panel for changing resolution, specifying monitor type, and so on.

With 2Mb VRAM the Stealth 64 supports a 24-bit display at 800 x 600 pixels, fine for 14 or 15in monitors, and at 1152 x 864 pixels with double the memory. The card has a maximum resolution of 1280 x 1024 with 65,536 colours and a top refresh rate of 120Hz.

As expected, the Diamond card came in with high scores in both high- and low-resolution display tests. Interestingly, it excelled at many of the direct speed tests such as line drawing, but couldn't quite match the similarly priced Orchid card in real application routines. Perhaps the power of the new 968 chip isn't being tapped by the drivers.

This is a great Windows accelerator and is being bundled with machines from quality PC suppliers like Dan Technology.

#### PCW Details

##### Diamond Stealth 64 VRAM PCI

###### Good Points

Quick, great value.

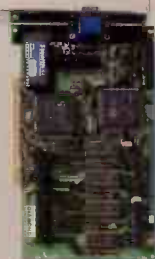
**Bad Points** Better at benchmarks than applications.

###### Conclusion

Superb.

**Price** £235 (2Mb), £365 (4Mb)

**Contact** Panrix  
01532 444958



### Diamond Viper Pro Video

**D**iamond appears to be playing it safe technology-wise — the Viper Pro Video is based on the Weitek 9100 engine. It has 2Mb or 4Mb fast VRAM and can manage resolutions up to 1600 x 1200 pixels with the higher configuration. Closer inspection reveals a 175MHz IBM RAMDAC, which limits the refresh rate to 66Hz at the highest resolution. According to the documentation, 1280 x 1024 pixels can be achieved at a more respectable 75Hz, in 24 bits, and all other modes supported are available at 100Hz or higher.

Our 4Mb sample had an optional video co-processor included. Strangely, the Weitek 9130 was attached to the reverse side — it looks as if it was included as an afterthought. Nevertheless, it greatly improves the performance of Video for Windows AVI files.

The Viper Pro is provided with standard Weitek drivers for Windows, AutoCAD and Microstation. Diamond also supplies a monitor setup program, VPROMODE, and recommends using this before running anything else. It has refresh settings for a number of popular screens, including those made by Hitachi, Sony and NEC, and there's a Generic option and test if your own setup doesn't match.

The Weitek engine has its good points and the Viper Pro did well in all tests. Its performance in high resolutions was excellent and it gave a good overall performance. In comparison with the Datapath Tornado, the only other card here with a similar Weitek setup, it loses out slightly as it doesn't offer the new 16:9 screen support or refresh rates as high. But in its 4Mb configuration, the Diamond Viper Pro Video is extremely desirable hardware.

#### PCW Details

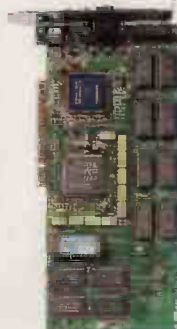
##### Diamond Viper Pro Video

**Good Points** 4Mb VRAM option, fast, AVI acceleration.

**Bad Points** Highest resolution under 70Hz refresh.

**Conclusion** First class.

**Price** £495  
**Contact** Panrix  
01532 444958



### Matrox Impression Plus

**M**atrox's Impression Plus is based on the custom Matrox Graphics Architecture (MGA) chipset, a 64-bit engine designed to go head-to-head with more popular off-the-shelf technology. It features hardware acceleration for 3D graphics in AutoCAD and MicroStation, with Gouraud shading at resolutions up to 1152 x 882 pixels. It comes with either 2Mb or 4Mb fast VRAM, and provides a maximum resolution of 1600 x 1200 pixels at 72Hz, with 8 bits per pixel on a 2Mb configuration or 16-bit colour with 4Mb. All other popular Windows resolutions are supported at higher refresh rates.

Thanks to the miracle of PCI installation is easy, and PowerDrivers are supplied for Windows, AutoCAD for DOS 11 and 12, AutoCAD 12 for Windows and MicroStation. A terminate and stay resident (TSR) program gives compatibility with software that calls for VESA-compatible SVGA modes, and a suite of Windows graphics utilities is bundled free. Possibly the best of these is ModeSwitch, which lets you change resolution and bit depth on the fly without restarting Windows.

The Impression Plus is a fine example of Matrox engineering, with smooth performance in the all-important 16-bit and 24-bit colour modes. The same cannot be said of low bit-depth operations, which were slow compared with many of the other products here. The MGA hardware offers more when it comes to serious 3D manipulation.

If you plan to work in 256 colours there are cheaper devices around, but those working with CAD and high resolutions should take a close look.

#### PCW Details

##### Matrox Impression Plus

**Good Points** Hardware 3D acceleration.

**Bad Points** Average 8-bit performance.

**Conclusion** Designer hardware.

**Price** £308  
**Contact** Memorex  
Telex 01734  
441544





**miroCrystal 40SV**

Employing the new S3 Vision964 64-bit engine and 4Mb of non-expandable VRAM, the miroCrystal 40SV is "a complete Windows solution". The half-length card offers a maximum resolution of 1408 x 1024 pixels with 16-bit colour at 70Hz, more than enough for most CAD, multimedia and DTP requirements. A Texas Instruments RAMDAC makes true colour available in modes from 640 x 480 through to 1152 x 864 pixels at 80Hz, and some resolutions have TV-compatible timing for use with an additional adaptor.

miro supplies optimised drivers for Windows and AutoCAD for DOS and Windows, and options are available for OS/2 and versions of WordPerfect. Several utilities are bundled, including programs to set a virtual screen, configure the tint of white used for particular environments, and adjust the monitor display settings.

Setting up went smoothly, but the miro gave only an average performance under our VNU European Labs graphics workout. The card is undoubtedly usable but is easily outgunned by the Tornado, Stealth 64 and Spea cards. It matched the Blue Dragon and the PixelSprint in 8-bit tests but fell down using higher bit depths.

AVI performance was acceptable but lacked the power of a dedicated video co-processor. Images scaled to full-screen at 800 x 600 or 1024 x 768 in any bit depth looked ropery.

The 40SV can't be faulted as a Windows solution, but at £415 it just doesn't cut it when compared with other products here. miro can supply more powerful products, but the price obviously increases with the performance.

**PCW Details****miroCrystal 40SV****Good Points**

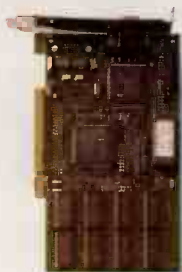
Good refresh rates at high resolution.

**Bad Points** Speed suffers at high bit-depths, no video acceleration.

**Conclusion** Good, but there are comparable cards for less money.

**Price** £415

**Contact** miro  
01494 510250

**MRT PixelSprint**

The Norwegian company MRT specialises in video products and has seen success in the UK with its VideoPort capture card (reviewed *PCW*, March 1995). The Weitek Power 9100-based PixelSprint is its first PCI graphics board. Our review model had a clean design, 4Mb VRAM, an IBM RAMDAC and a BIOS EPROM mounted in a chip carrier. There were no feature connectors of any kind, preventing the card from being used with overlay hardware such as Orchid's Videola. According to the pre-production documentation supplied, a 2Mb version is also available.

MRT's Weitek implementation supports display modes up to 1600 x 1200 pixels with 16-bit colour but at a 60Hz refresh rate that gives it a flicker many will find intolerable. Lower resolutions have higher refresh rates and the card can be used at a respectable 1024 x 768 pixels without problems. 32 bits per pixel displays are supported, but our high bit-depth tests were all carried out at 24.

The PixelSprint comes with drivers for Windows 3.1, NT, OS/2, AutoCAD and MicroStation. These will get you up and running, but that's about all they'll do — MRT doesn't give you a suite of graphics utilities. The standard Weitek Windows drivers are easy to set up and support an optional video co-processor not installed on this card.

For a first attempt the PixelSprint did well in all true-colour tests, due primarily to the power of the 9100 processor. It performed as well the Datapath Tornado, Stealth 64 and Number 9 GXE64 Pro, but it appears that the drivers have been optimised for 16.7 million colours: results in 256-colour modes were a little disappointing.

**PCW Details****MRT PixelSprint**

**Good Points** 4Mb VRAM, fast Weitek engine.

**Bad Points** No video co-pro.

**Conclusion** Good hardware, but needs more software.

**Price** £439 (2Mb),  
£499 (4Mb)

**Contact**  
Visimetrics  
01436 677557

**Number 9 GXE64 Pro**

The GXE64 Pro is Number 9's top 64-bit offering and comes in VL and PCI versions. It is an S3 Vision964-based card which comes with either 2Mb or 4Mb VRAM installed. *PCW* was supplied with the former, but this model is field upgradable using eight easy-to-fit plug-in memory chips. It has standard and enhanced VESA feature connectors for attaching additional devices such as digital video overlay boards.

With 2Mb the card delivers 1280 x 1024 pixels in up to 256 colours at 74Hz. All other modes offer a maximum refresh rate of 100Hz or higher, and 24-bit colour is available at 800 x 600 pixels. With 4Mb users can get 65,000 colours at the top resolution, and 16.7 million in all other SVGA modes.

As well as drivers for Windows 3.1, NT and OS/2, the GXE64 Pro comes with Number 9's HawkEye for Windows utilities for changing resolution, setting the monitor refresh rate, creating a panoramic virtual screen and making use of the hardware's zoom feature, which can magnify images up to five times for precision editing. All the software proved intuitive and easy to use.

Amazingly, under the VNU European Labs tests, the GXE64 Pro performed almost as well as its 128-bit brother, and slightly better in some cases. The hardware was particularly adept at high-resolution 8-bit manoeuvres, and the results for true colour tests were excellent too.

With an RRP of £339 the GXE64 Pro is reasonably priced, but not as good value for money as, say, Orchid's offering. If you really need higher modes a more expensive version, the Pro1600, is available, but most users' needs will be well catered for.

**PCW Details****Number9 GXE64 Pro****Good Points**

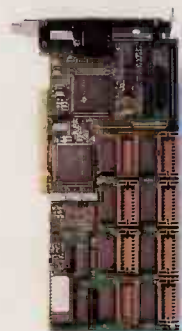
Good performance.

**Bad Points** Could be cheaper.

**Conclusion** A great card.

**Price** £399 (£505 with 4Mb)

**Contact** Mentor  
01582 483381





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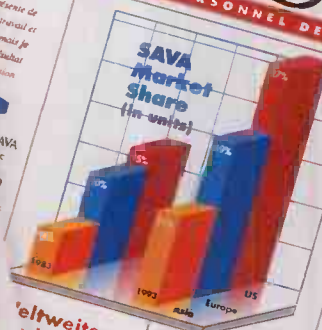
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posto di lavoro ..... 2  
Lavoro e famiglia: come il tuo  
datore di lavoro risponde ... 2  
Il colore nelle tue  
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### Number 9 Imagine 128-1280

With a brand new 128-bit custom graphics engine, the Imagine 128-1280 from Number 9 is billed as "the world's fastest true-colour graphics and multimedia accelerator". At first glance it certainly looks the part: three huge pieces of well integrated silicon dominate most of the board. The largest is the new graphics engine, geared specifically for fast image manipulation at high bit-depths, followed by a 175MHz Texas Instruments RAMDAC and a Cirrus Logic VGA chip. Another version of the card, the 128-1600, has a 220MHz RAMDAC and offers slightly higher resolutions.

Our review model had an empty chip socket waiting to take an additional 512kb-2Mb of DRAM. This DRAM acts as what Number 9 calls "masking memory", a kind of temporary bitmap storage zone that speeds up window redraw speeds. Display modes available on our version ranged from 640 x 480 through to 1280 x 1024 at 74Hz or higher. The highest resolution can be used in either 8- or 16-bit, and true colour is offered in all resolutions below this.

The Imagine did prove interesting under our benchmark suite and its performance in 8-bit tests was nothing short of unremarkable: despite the power of its 128-bit engine it was slower than many significantly cheaper products. Other tests proved that it excels at 16-bit and 24-bit operations, and anyone who buys the Imagine is unlikely to want to use anything other than true colour.

This is a well designed product aimed primarily at those who work heavily in true colour. Its only real drawback is price: at £779 it's a lot more expensive than some 64-bit cards for only slightly better performance.

#### PCW Details

##### Number 9 Imagine 128-1280

**Good Points** Fast in true colour, easy to set up.

##### Bad Points

Average performance at 256 colours.

**Conclusion** Great for high bit-depth work.

**Price** £799

**Contact** Mentor  
01582 483381



### Orchid Fahrenheit Pro64

The Fahrenheit Pro64 PCI is Orchid's current top-of-the-line product for users who demand the best in Windows acceleration. It uses the 64-bit S3 Vision964 processor, cunningly disguised with an Orchid sticker, coupled with a BrookTree RAMDAC and either 2Mb or 4Mb VRAM. A three-quarter-length card, it's bigger than most other products here, but strangely doesn't boast any kind of feature connector, VESA or otherwise.

As with other S3 cards the 4Mb version supports non-interlaced displays up to 1280 x 1024 in 16-bit colour. All lower modes can be used with 24-bits per pixel at refresh rates of 70Hz or higher. If your monitor can handle it, the card can put out 640 x 480 at a rock solid 120Hz.

Orchid supplies optimised drivers for Windows, AutoCAD, Microsoft Word, WordPerfect and Lotus 1-2-3 in the box. Options are available for other operating systems like OS/2 2.1 and NT although it would have been nice to see these included as standard, and the company can be contacted through its own technical support BBS and on CompuServe. The usual virtual desktop and zoom control software utilities are provided.

The Fahrenheit Pro64 gave an outstanding overall performance, and its user-friendly software made it easy to install and get going. In tests the hardware proved better at 8-bit work than with true colour, but its performance with high bit-depths is above average. The card compares favourably with the more expensive Number 9 GXE64 Pro, which in turn proved almost as good as its 128-bit brother, and comes virtually neck and neck with the Diamond Stealth 64 VRAM.

#### PCW Details

##### Orchid Fahrenheit Pro64

**Good Points** Fast, good value.

**Bad Points** No VESA connector.

**Conclusion** A hot product.

**Price** £279 (2Mb),  
£369 (4Mb)

**Contact** Orchid  
01256 479898



### Paradise Bahamas 64PCI

When I arrived at PCW in 1987, the Paradise VGA card was akin to gold dust. In tests it had been confirmed as one of the best devices around, and anyone who knew anything about graphics cards tried to get their hands on a review sample. Being as sneaky as they come, I quickly secured one.

The Paradise entry here is the excellently named Bahamas 64, a 1Mb DRAM card upgradable to 2Mb with plug-in chips. Our review model came with the extra megabyte installed and put out a top resolution of 1600 x 1200 pixels in 256 colours at 60Hz. A 75Hz refresh mode is available in all other resolutions, but high bit-depth modes above 800 x 600 pixels are not supported on the unexpanded model.

Windows drivers are easily installed with the supplied setup program, and other custom DOS drivers for use with Autodesk software, including 3D Studio, are on the disk.

Under our benchmarks this S3 Vision864-based card did amazingly well in all bit-depths and resolutions. The engine is relatively old, but the drivers appear to be well crafted and deliver speeds comparable to some Weitek 9100 and S3 964 products. It was compatible with everything thrown at it, but then, Paradise has always been good in this area.

Paradise has clearly kept its leading position and has produced a fine card. Raw processor speed tests put other cards ahead, but in our application-based benchmarks its results were impressive. It would have been nice to see a VRAM version with more memory, but it's unlikely that anyone who buys the Bahamas 64PCI will complain.

#### PCW Details

##### Paradise Bahamas 64PCI

**Good Points** Speedy.

##### Bad Points

Limited to 2Mb, no VRAM.

**Conclusion** Well made.

**Price** £110 (1Mb);  
£130-£140 (2Mb)  
(street prices)

**Contact**  
Western Digital  
01372 360055





**Samsung PVGA-S3**

**S**amsung is a name more often associated with monitors and microwaves than graphics cards, but the company decided to enter our group test with the PVA-S3. This small card boasts an S3 engine and RAMDAC, plus 1Mb or 2Mb DRAM and an Octek BIOS.

PCW was supplied with the upgraded version of the card which, according to a VESA extended mode table at the back of the manual, can deliver a 1600 x 1200 pixel interlaced display at a more or less useless 43Hz. Strangely, the rest of the manual stops at 1280 x 1024 with 16 colours at a far more usable 75Hz. The best compromise on offer is an 8-bit 1024 x 768 mode, ideal for word processing or spreadsheet work on a 17in screen.

Software supported is Windows 3.1 and NT, AutoCAD, 3D Studio and MicroStation but not OS/2. No utilities are included.

In common with the other 2Mb DRAM products here, the Samsung came up with good video transactions scores in both 8-bit and 24-bit tests. Unfortunately, its limited RAM and low refresh rates and bit depths at high resolutions mean that it can't quite cut it when compared to most of the other cards tested. Also, although it's inexpensive, it works out a little more costly than the outstanding Cirrus Logic Alpine.

The Samsung PVGA-S3 is a nice little budget number, and if you can get it cheap enough then it will be great for most Windows operations on small screens. Annoyingly, Samsung could only give us a firm price for the 1Mb version; it's up to users to find the chips if they want more video RAM.

**PCW Details****Samsung PVGA-S3**

**Good Points**  
Cheap. Easy to use.

**Bad Points**  
Limited.

**Conclusion**  
Cheap and cheerful.

**Price** £120 (1Mb),  
approx £160 (2Mb)  
**Contact** Samsung  
0181 862 9311

**Spea Mercury P-64**

**T**he Mercury P-64 is one of two Spea entries in this test and is another card based on the popular 64-bit S3 Vision964. With 2Mb of high-speed VRAM the Mercury offers all the expected VGA and SVGA resolutions. Full 24-bit colour is available at both 640 x 480 and 800 x 600 pixels, and an eye-friendly 75Hz refresh rate can be set in all modes.

The S3 Vision964 chipset provides bit block transfer, line drawing, polygon/ellipse fill routines and a cursor sprite in hardware. With the right driver these features can greatly increase the speed of the screen update, especially in art applications like CorelDraw.

Spea's Windows setup program is easy to configure, and the Mercury was up and running in the VNU Labs in a couple of minutes. If the display is slightly off-centre it can be corrected with the supplied WinTune program, and a rather smart SpeaView utility lets you switch resolution without restarting Windows provided you stay at the same bit depth.

All the software bundled is well presented, but the bit depth changer can be confusing at first because it doesn't grey out modes that are unavailable at the select resolution.

In both 8- and 24-bit tests the Mercury was a top performer, scoring the same kind of results as the all new 128-bit Imagine from Number 9. It performed well with general applications such as Word and Excel and its speed was a bonus when using Adobe Photoshop. It's a credit to Spea's engineers that while the miro40SV uses the same chip, it didn't get anywhere near the same score.

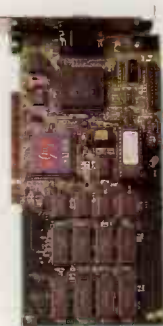
**PCW Details****Spea Mercury P-64**

**Good Points** Fast, good software.

**Bad Points** Only 2Mb VRAM.

**Conclusion** A nice Windows solution.

**Price** £265  
**Contact** Spea  
01844 261886

**Spea Mirage P-64**

**S**pea's other contender for our Editor's Choice is the Mirage P-64, a lower-end upgradable solution based on the tried and tested S3 864 graphics engine. The card features 1Mb VRAM as standard, upgradable to 2Mb via easy to install plug-in chips, and externally looks much the same as the other cards here, with a VESA connector at the top and a VGA output on the back.

With 1Mb fitted the highest resolution on offer is 1280 x 1024 pixels, with a total of 16 colours on screen at a practically unusable 60Hz. A far better setting is a slightly lower 1152 x 870, which will run at a clear 70Hz in 8 bits per pixel. A true colour option can only be obtained at 640 x 480, but all the modes on offer are non-interlaced. Adding the extra megabyte of VRAM allows all resolutions to be used at 75Hz or higher with greater bit depths.

The Mirage comes with the BigWin driver for Windows, SpeaView, and an ADI driver and utility software for AutoCAD.

The Mirage managed to keep up with its brother in all 8-bit tests, and came out with an overall transaction score that was just one point less. Unfortunately, try as we might, we couldn't get the card to work properly with our benchmark suite in 24 bits. No results for this mode can be posted, but additional subjective tests were carried out instead.

The Spea Mirage P-64 doesn't perform as well as the Mercury or some other more expensive products, but makes a good entry level into the world of high-end graphics adaptors. At £145, or £185 with the much needed memory upgrade, it's a good budget offering that will suit most office workers who occasionally need some graphics oomph.

**PCW Details****Spea Mirage P-64**

**Good Points**  
Cheap, upgradable.

**Bad Points**  
Wouldn't run tests in 24 bits, often outperformed.

**Conclusion**  
Average.

**Price** £145 (1Mb),  
£185 (2Mb)  
**Contact** Spea  
01844 261886





## Resolutions and colour depth

Windows objects, icons, spreadsheet cells and title bars will always be the same number of pixels in size whatever the resolution. Consequently, at higher resolutions they will appear smaller and you'll be able to fit more on the desktop. Make them too small and you won't be able to see them at all, which is why higher resolutions work better on physically larger monitors where the pixels are correspondingly larger.

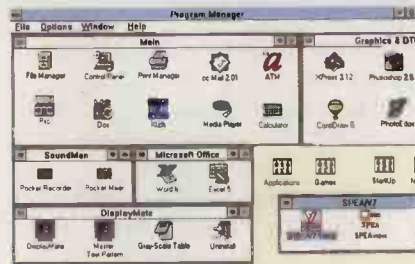
Typical ideal resolutions are 640 x 480 on a 14in monitor, 800 x 600 or 1024 x 768 on a 15in, 1024 x 768 or 1152 x 882 on a 17in, and 1280 x 1024 or even 1600 x 1200 on a 20/21in display. Usually, graphics circuitry can support much higher modes than a typical monitor, so make sure your display will be able to cope with any modes you have in mind (check out our monitors group test in the February 1995 issue).

The graphics circuitry, be it on a card or mounted on the motherboard, takes commands from Windows via the processor and turns them into a bitmap. This digital bitmap is then converted into an analogue signal, suitable for a monitor.

Windows describes the desktop in numerous ways, with parts or even the whole in device-independent vector form. This graphical device interface (GDI) information is rasterised into a bitmap, at the working resolution in the required number of colours. The graphics circuitry features video memory, like RAM, but is usually faster still and capable of shifting information in one end and out the other at the same time. This memory contains the bitmap. If you want a higher resolution or more colours, you'll need more video memory.

VGA mode works at a resolution of 640 x 480 pixels in 16 colours or sometimes 256, requiring around 256kb of video memory. A resolution of 1024 x 768 pixels in 256 colours requires 1Mb of video memory. The number of colours, or pixel depth, is described in numbers of bits. The total number of colours is two to the power of the number of bits; 8-bit offers 256 colours, 16-bit (high colour) supplies 65,536 and 24-bit (true colour) reaches that mystical figure of 16,777,216 colours.

With regard to precise numbers of colours, the more observant of you may have thought about real life. How many colours are there? Are there really just under 16.8 million of them? The answer to the latter question is a big no. Nature is an analogue system with infinite varieties and no quantised steps between. This includes our eyes, which despite falling off to zero



*The same desktop viewed at three different resolutions, 640 x 480, 1024 x 768, 1280 x 1024. Notice how higher resolutions fit more on screen, but the smaller details would be best viewed on a larger monitor*

sensitivity at the extreme ends of the visible spectrum detect continuous, stepless signals in between.

Digital devices, such as computers, by definition work with discrete, stepped values. In order to simulate reality they chop up the continuous, smooth analogue signal into little bits. This technique, known as sampling, produces a more realistic result with finer chops. The trick is to chop finely enough for the desired effect. Compact discs chop the analogue sound 44,100 times a second in order to fool us into thinking we're hearing the original music.

And on to vision. Imagine a line, jet black at one end and pure white at the other with a smooth transition of greys between the two. If you had to split the line up into separate, discrete grey levels, how many would you need to fool the human eye into perceiving a totally

smooth transition? Tests show the figure to be around 200. When developing perfect-looking digital greyscale displays, the number used is 256, or 8-bit once again.

If you want a display to fool the eye into seeing full colour, you need 256 shades of red, green and blue; that is, eight bits per three primary colours, hence 24 bits in total. 16-bit colour requires twice the memory of 8-bit, while 24-bit requires three times the memory of 8-bit at the same resolution. Consequently, 24-bit at 1024 x 768 pixels would require 3Mb of video memory.

Extra colours will render photographic images and shades more accurately. One point to note is that shifting 24 bits around the screen takes around three times longer than 8 bits, hence the proliferation of accelerated 24-bit offerings. Bear in mind that accelerated 24-bit may not even be as fast as unaccelerated 8-bit in simple tasks like moving or resizing windows.

But while having so much video memory that you can run millions of colours at extra-high resolutions may be great, it can cost lots of money. An alternative is to realise that video memory is a shared resource between resolution and pixel depth: decrease the resolution and you can increase the number of colours. If you have the appropriate drivers, 1Mb of video memory can do 8-bit at 1024 x 768 pixels, 16-bit at 800 x 600 or 24-bit at 640 x 480. 16-bit may not look as good as 24-bit but it's a vast improvement over 256 colours.

The terms "interlaced" and "non-interlaced" creep in around this point. Interlacing is the process of drawing every other line, say 1, 3, 5, until the entire screen is full, then going back to the top and drawing the others, say 2, 4, 6, again until the bottom is reached. Since an entire frame is drawn in two goes, the resulting effect is a highly undesirable flickering display. Non-interlaced is where every line is drawn before returning to the top for the next frame, resulting in a far steadier display.

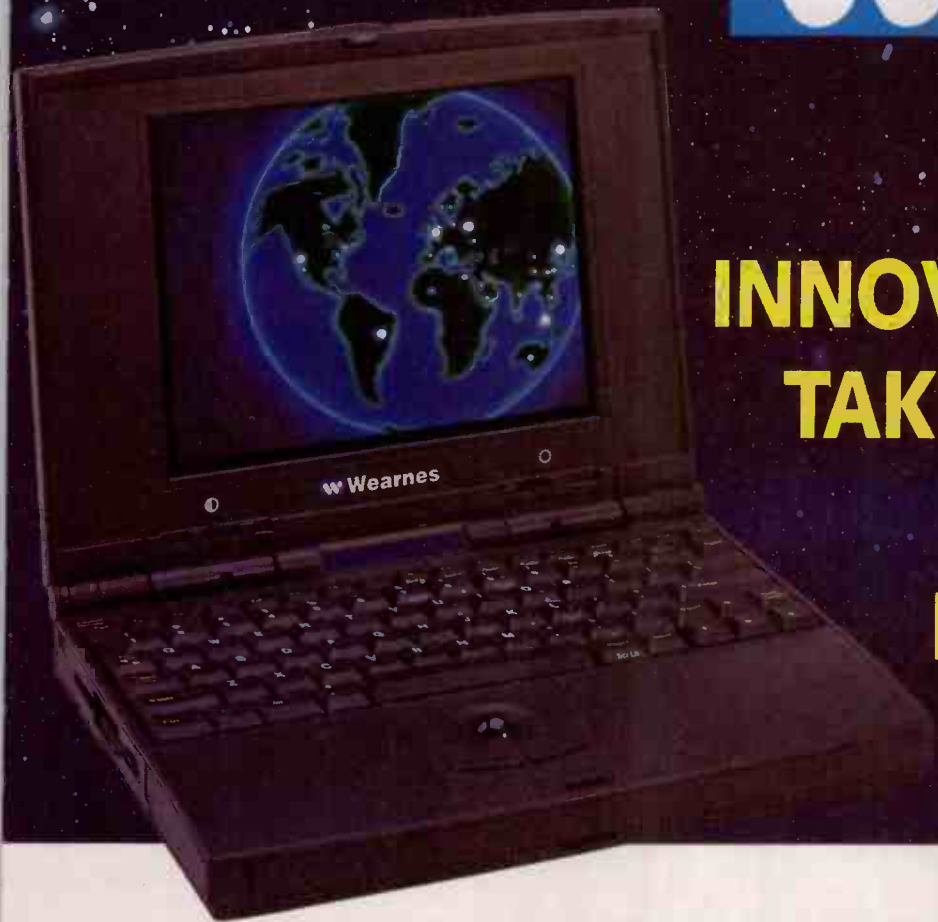
The last point to note is refresh rate, measured in hertz (Hz) and representing the number of frames displayed on screen per second. Too few, and the eye will notice the intervals in between and perceive a flickering display. However, at a certain point most people's eyes and brains can't keep up and perceive a perfectly steady display. The worldwide accepted refresh rate for a flicker-free display is 70Hz and above, although many can see improvements from 72 to 75Hz. Below 70Hz is unacceptable to most eyes, as are any interlaced modes.

**Gordon Laing**





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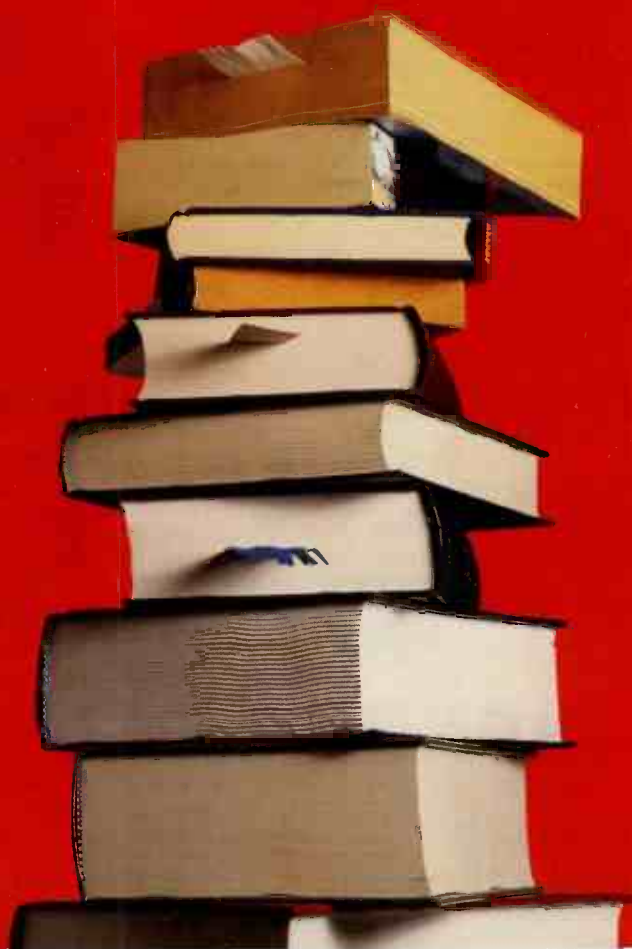


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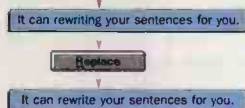
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## PCI explained

The PC world is dogged by standards. Most of these have come from autocratic market dominance and sheep-like following. Any attempt at producing a standard which has required the co-operation of a number of companies has failed, with one exception: Peripheral Component Interconnect. The impetus for this standard came from Intel, and despite corporate insistence to the contrary, the PCI bus is still seen as an Intel standard. It is also, as it happens, a very good standard.

Intel saw that a machine with a 32-bit processor and a 16-bit ISA bus wasn't going to be any good at pumping ions. A new faster, wider bus was needed. The VL-bus seemed up to the job: it was essentially the signals which came out of a 486 tidied up a bit and fed to whatever was plugged in. But there were problems, especially if you wanted to access several cards at once. With PCI, the committee formed by Intel, the PCI Special Interest Group (SIG) took the opportunity to address a number of other problems the PC was due to face in adolescence.

The new cards could offer simpler, standard circuitry to connect to the chipset on the motherboard, which would make add-in cards cheaper. In most graphics cards the

circuitry which does this is built into the video chips on the card. The system could be jumperless — none of the video cards in this test have to be reconfigured to avoid clashes with other cards; they do it automatically. And with the right operating system software, even the drivers could be automatically selected. This Plug and Play feature is supported by a lot of machines but won't be useful until Windows 95 makes it to the shops.

Before PCI, some graphics card manufacturers produced ever-faster cards which needed as little information from the processor as possible. Cards like the Hercules Graphic Station, which used the TIGA (Texas Instruments Graphics Array) soon became more powerful than the computer into which it was plugged. A much neater solution was to remove the bottleneck.

Some systems, including Intel's first dabblings, put the peripherals on the processor bus. With no system I/O controller to get in the way this might seem quicker, but while it's much easier to engineer than making special system I/O chips, and provides the end-user with a quick system, it's only really suitable for graphics and limits expansion of the system. By separating the local bus from the processor bus, the peripherals aren't

quite as local but there are manifold benefits. With the PCI local bus there's the ability to switch between 32- and 64-bit operation. The bus also becomes independent of the processor type. A processor bus-type local bus solution ties the peripherals to the pinouts of that processor. Intel sees this processor independence as a way to produce cards which will work with Pentium, P6 and Intel processors of the future.

For system builders the effect on video performance is remarkable. Again, local bus is cheaper and faster than traditional solutions. Using PCI, a dumb frame buffer can give an acceptable performance. Graphics performance is determined by the write speed. If the processor waits on a write it slows the display speed far more than waiting on a read, because video reads are so rare. By designing the PCI bus to have zero processor wait-state writes, especially on higher frequency processors, the bus gets the most out of video cards. For this reason the video is best put on the system I/O bus. Adding a buffer helps, but using the PCI controller eliminates the waits and makes the most of the burst mode. Intel claims this can give up to 50 percent better graphics performance than VL-bus.

**Simon Rockman**

## Editor's Choice

Choosing just one of the products here to receive the Editor's Choice turned out to be a particularly difficult task — and not because they were all bad, either. Just the reverse: almost all the cards reviewed here were fast and scored highly under the new VNU European Labs tests.

If speed were the only issue involved in making a choice, we could have simply picked the card that scored the highest number of video transactions per second. This is an important figure, to be sure, but no test can take the equally crucial aspects of price/performance, refresh rates, ease of setup, support and bundled extras into account. It was weighing up these points that caused us all the headaches.

In terms of price/performance and overall score under the tests, the Cirrus Logic Alpine card could not be beaten and receives a Highly Commended. It outperformed every card in 24 bits at 800 x 600 pixels and wasn't exactly a slouch in higher resolution tests. It was especially good at Windows text manoeuvres and would make an ideal product for those heavily involved in word processing. The problem

is that the Alpine's design is ultimately limited: with 2Mb of DRAM it can't match the competition when it comes to resolution and refresh. If Cirrus could come up with a 4Mb version with a faster RAMDAC it would give a lot of people a run for their money.

Other products that stood out once everything was taken into account were the Data-path Tornado VIP, Diamond's Stealth 64 VRAM and the Fahrenheit Pro 64 from Orchid. The Tornado is expensive but has just about everything you could want — a powerful engine, 4Mb of VRAM, video co-processor for superior AVI playback, the highest resolution support and good refresh in all modes. The only drawback with this card was the price: at £549 with all the features it's one of the most expensive on test. Still, it deserves to be our second Highly Commended card.

Finally, after much debate, we managed

to boil the finalists down to two products: the Diamond Stealth 64 VRAM and the Orchid Fahrenheit Pro 64. Both gave good performance in high resolutions and high bit-depth, and at just over £300 street price represent great value for money.

An in-depth review of the test results showed the Diamond to be great at coping with specific GDI routines that deal with line drawing and unfilled geometric shapes. The Orchid, on the other hand, was far better at the arguably more important application level and preferred to work with pattern or solid filled graphics. It was also faster at text handling in all tested modes.

Finally, in terms of technical support, Orchid has a UK office and in a number of telephone tests as Joe Public we managed to get through to it every time. There is also a bulletin board where new drivers can be downloaded by users. To be fair, Panrix gives good support for the Diamond range of graphics cards but doesn't quite match up when it comes to the crunch. The winner of the Editor's Choice is therefore the Orchid Fahrenheit Pro 64, and the Stealth 64 VRAM receives our final Highly Commended.





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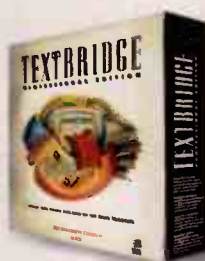
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## How the tests were done



The VNU European Labs Tests, currently Euromark version 2.0, have been developed to give a broad measure of performance at both the component and applications level. Component tests measure the raw performance of the hardware by carrying out certain low-level Windows functions such as drawing lines and polygons. These, unfortunately, do not always reflect reality so applications tests are used to simulate real-world use by running exercises in leading packages.

All the supplied graphics cards were PCI-based although many are available as VL-bus cards. Testing was carried out using VNU European Labs' IBM PS/VP reference machine: an IBM DX4/100 with 16Mb RAM and an IDE hard disk. The cards were tested in two resolutions: 800 x 600 at 16.7m colours (24 bits per pixel) and 1024 x 768 at 256 colours.

Emphasis is placed on testing with Windows as this places greater demands on graphics cards than DOS does. With the exception of CAD and similar applications, even the most graphically intensive

DOS program will seldom go above VGA or VESA resolutions and colour depths. Subjectively, all the graphics cards tested produce satisfactory results for DOS applications.

Examples of VNU European Labs' Windows component tests are routines that write text, or flash a picture or a DIB (Device-Independent Bitmap) on screen. In bench-testing display adaptors, low-level (GDI) tests are less trustworthy than application-level ones because many of the card/driver combinations can (and will) cache frequently written images, influencing the overall result. Nonetheless, Euromark tests the speed of many common GDI operations including a selection of BLT (blit) operations, line drawing, fills and polygon draws. Another important GDI function is text rendering speed — vital to word processing.

The application-level tests are the most relevant: applications used during tests include Lotus Freelance Graphics for Windows, CorelDraw, PowerPoint and Excel (used to produce graphs).

Not surprisingly, there are marked differences between a graphics card's

performance at different resolutions. High-end graphics cards are often fine-tuned for specific applications. They perform best at 1024 x 768 resolution and greater colour depths.

All results are presented in Transactions Per Second (tps) — the larger the number, the better the performance. Taking the normal arithmetic mean of all the numbers would make for easy evaluation of the cards, but it would be over-influenced by a card's particular good and bad points. To overcome this problem, the geometric mean is used. This reduces the effect of extreme results to give a more representative score overall.

One of the most important influences on performance is the quality of the drivers supplied. Drivers act as the interpreter between the hardware in your PC and that on the card itself. Poorly written drivers can slow the operation of the card tremendously and make it less reliable. In effect, the hardware starts talking in broken English and the two sides don't understand each other fully. Drivers can make or break a good piece of hardware.

## Video transactions per second

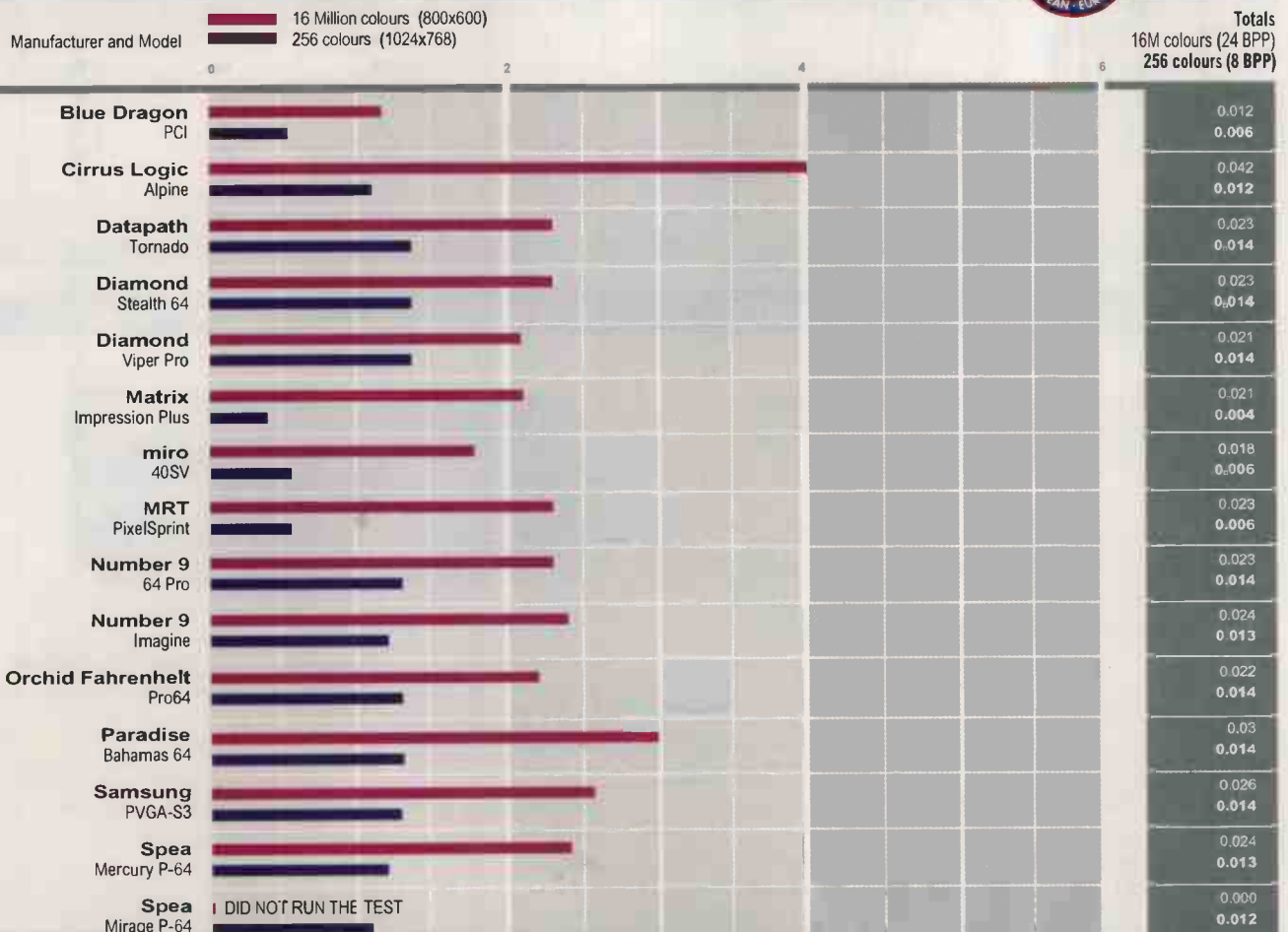




TABLE OF FEATURES PCI GRAPHICS CARDS

| MANUFACTURER & MODEL      | Blue Dragon     | Cirrus                  | Datapath                   | Diamond                      | Diamond                       | Matrox                       | miro         |
|---------------------------|-----------------|-------------------------|----------------------------|------------------------------|-------------------------------|------------------------------|--------------|
|                           | Blue Dragon PCI | Cirrus Logic Alpine     | Datapath Tornado VIP       | Diamond Stealth 64 VRAM      | Diamond ViperPro Video        | Matrox Impression Plus       | miro 40SV    |
| Supplier                  | Eurotech        | Eurotech                | Datapath                   | Diamond                      | Diamond                       | Memorex Telex                | miro         |
| Tel                       | 01734 810011    | 01734 810011            | 01332 294441               | 01532 444958                 | 01532 444958                  | 01734 441544                 | 01494 510250 |
| Price                     | £449 4Mb        | £89 (1Mb)<br>£129 (2Mb) | £495 /<br>£549 with co-pro | £235 (2Mb)<br>£365 (4Mb)     | £495                          | £308 (2Mb)<br>£513 (4Mb)     | £415         |
| Processor                 | Weitek 9100     | Cirrus Logic            | Weitek 9100                | S3 Vision968                 | Weitek 9100                   | MGA                          | S3 Vision964 |
| Processor type            | 64-bit          | 64-bit                  | 64-bit                     | 64-bit                       | 64-bit                        | 64-bit                       | 64-bit       |
| VRAM                      | 4Mb             | None                    | 4Mb                        | 2 - 4Mb                      | 2 - 4Mb                       | 2 - 4Mb                      | 4Mb          |
| DRAM                      | None            | 1 - 2Mb                 | None                       | None                         | None                          | None                         | None         |
| VESA feature connector    | ○               | ●                       | Yes (on co-pro version)    | ●                            | ●                             | ●                            | ●            |
| Video acceleration co-pro | ○               | ○                       | Optional                   | ○                            | ●                             | ○                            | ○            |
| Max bit depth 640x480     | 32-bit          | 24-bit                  | 32-bit                     | 24-bit                       | 32-bit                        | 24-bit                       | 24-bit       |
| Max bit depth 800x600     | 32-bit          | 24-bit                  | 32-bit                     | 24-bit                       | 32-bit                        | 24-bit                       | 24-bit       |
| Max bit depth 1024x768    | 32-bit          | 16-bit                  | 32-bit                     | 16-bit (2Mb)<br>24-bit (4Mb) | 16-bit (2Mb)<br>32-bit (24Mb) | 16-bit (2Mb)<br>24-bit (4Mb) | 24-bit       |
| Max bit depth 1280x1024   | 24-bit          | 8-bit                   | 24-bit                     | 8-bit (2Mb)<br>16-bit (4Mb)  | 8-bit (2Mb)<br>24-bit (4Mb)   | 8-bit (2Mb)<br>24-bit (4Mb)  | 16-bit       |
| Max bit depth 1600x1200   | 16-bit          | N/A                     | 16-bit                     | N/A                          | 8-bit (4Mb)                   | 8-bit (2Mb)<br>16-bit (4Mb)  | N/A          |
| Max refresh 640x480       | 100Hz           | 75Hz                    | 100Hz                      | 120Hz                        | 100Hz                         | 120Hz                        | 100Hz        |
| Max refresh 800x600       | 100Hz           | 75Hz                    | 100Hz                      | 120Hz                        | 100Hz                         | 120Hz                        | 100Hz        |
| Max refresh 1024x768      | 100Hz           | 72Hz                    | 100Hz                      | 100Hz                        | 100Hz                         | 120Hz                        | 100Hz        |
| Max refresh 1280x1024     | 95Hz            | 87Hz (int)              | 100Hz                      | 75Hz                         | 95Hz                          | 90Hz                         | 75Hz         |
| Max refresh 1600x1200     | 66Hz            | N/A                     | 80Hz                       | N/A                          | 66Hz                          | 76Hz                         | N/A          |
| Virtual desktop           | ○               | ○                       | ●                          | ●                            | ●                             | ●                            | ●            |
| Zoom                      | ○               | ○                       | ●                          | ●                            | ●                             | ●                            | ●            |
| Windows drivers           | ●               | ●                       | ●                          | ●                            | ●                             | ●                            | ●            |
| Windows NT drivers        | ●               | ●                       | ●                          | ●                            | ●                             | ●                            | ●            |
| OS/2 drivers              | ●               | ●                       | ●                          | ●                            | ●                             | ●                            | ●            |
| AutoCAD drivers           | ●               | ●                       | ●                          | ●                            | ●                             | ●                            | ●            |

● = Yes ○ = No

## Graphics cards: a glossary

## DIP

Dual In-line Package. In the context of this review they are memory chips with two rows of legs (or pins) along each side at right angles to the chip.

## SIP

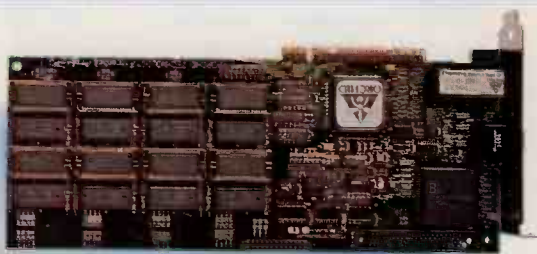
Single In-line Package. On graphics cards SIPs are used for memory (often VRAM) and are slim, rectangular chips with connectors along one edge. They are oriented vertically to take up less space on the circuit board.

## RAMDAC or DAC

Random Access Memory Digital to Analogue Converter. It converts the digital data from the PC to the analogue data required by the monitor for display.

## Feature Connector

A standard 26-pin plug for passing the VGA signal on to



some other device, often a video overlay board. The feature connector cannot pass the high-resolution signal from the card and is limited to VGA.

## VM Channel

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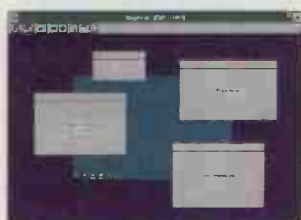
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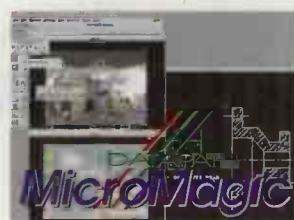
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**409**

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|                           | MRT PixelSprint          | Number 9 GXE64 Pro           | Number 9 Imagine 128-1280 | Orchid Fahrenheit Pro64      | Paradise Bahamas 64          | Samsung PVGA - S3            | Spea Mercury P-64 | Spea Mirage P-64             |
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| Price                     | £439 (2Mb)<br>£499 (4Mb) | £339 (2Mb)<br>£505 (4Mb)     | £ 799                     | £279 (2Mb)<br>£369 (4Mb)     | £110 (1Mb)<br>£140 (2Mb)     | £120 (1Mb)<br>£160 (2Mb)     | £ 265             | £145 (1Mb)<br>£185 (2Mb)     |
| Processor                 | Weitek 9100              | S3 Vision964                 | Custom                    | S3 Vision964                 | S3 Vision864                 | S3 Vision864                 | S3 Vision964      | S3 Vision864                 |
| Processor type            | 64-bit                   | 64-bit                       | 128-bit                   | 64-bit                       | 64-bit                       | 64-bit                       | 64-bit            | 64-bit                       |
| VRAM                      | 2 - 4Mb                  | 2 - 4Mb                      | 4Mb                       | 2 - 4Mb                      | None                         | None                         | 2Mb               | 1-2Mb                        |
| DRAM                      | None                     | None                         | 512kb optional            | None                         | 1 - 2Mb                      | 1 - 2Mb                      | None              | None                         |
| VESA Feature connector    | ○                        | ●                            | ●                         | ●                            | ○                            | ●                            | ●                 | ●                            |
| Video acceleration co-pro | ○                        | ○                            | ○                         | ○                            | ○                            | ○                            | ○                 | ○                            |
| Max bit depth 640x480     | 32-bit                   | 24-bit                       | 24-bit                    | 24-bit                       | 24-bit                       | 24-bit                       | 24-bit            | 24-bit                       |
| Max bit-depth 800x600     | 32-bit                   | 24-bit                       | 24-bit                    | 24-bit                       | 16-bit (1Mb)<br>24-bit (2Mb) | 16-bit (1Mb)<br>24-bit (2Mb) | 24-bit            | 16-bit (1Mb)<br>24-bit (2Mb) |
| Max bit depth 1024x768    | 32-bit                   | 16-bit (2Mb)<br>24-bit (4Mb) | 24-bit                    | 16-bit (2Mb)<br>24-bit (4Mb) | 8-bit (1Mb)<br>15-bit (2Mb)  | 8-bit (1Mb)<br>15-bit (2Mb)  | 16-bit            | 8-bit (1Mb)<br>16-bit (2Mb)  |
| Max bit depth 1280x1024   | 24-bit                   | 8-bit (2Mb)<br>16-bit (4Mb)  | 16-bit                    | 8-bit (2Mb)<br>16-bit (4Mb)  | 4-bit (1Mb)<br>8-bit (2Mb)   | 4-bit (1Mb)<br>8-bit (2Mb)   | 8-bit             | 4-bit (1Mb)<br>8-bit (2Mb)   |
| Max bit depth 1600x1200   | 16-bit                   | N/A                          | N/A                       | N/A                          | 8-bit (2Mb)                  | N/A                          | N/A               | N/A                          |
| Max refresh 640x480       | 72Hz                     | 120Hz                        | 100Hz                     | 120Hz                        | 75Hz                         | 75Hz                         | 100Hz             | 90Hz                         |
| Max refresh 800x600       | 72Hz                     | 120Hz                        | 100Hz                     | 90Hz                         | 75Hz                         | 75Hz                         | 100Hz             | 90Hz                         |
| Max refresh 1024x768      | 70Hz                     | 120Hz                        | 100Hz                     | 85Hz                         | 75Hz                         | 75Hz                         | 100Hz             | 75Hz                         |
| Max refresh 1280x1024     | 60Hz                     | 74Hz                         | 74Hz                      | 75Hz                         | 75Hz                         | 75Hz                         | 75Hz              | 75Hz                         |
| Max refresh 1600x1200     | 60Hz                     | N/A                          | N/A                       | N/A                          | 60Hz                         | N/A                          | N/A               | N/A                          |
| Virtual desktop           | ○                        | ●                            | ●                         | ●                            | ○                            | ○                            | ●                 | ●                            |
| Zoom                      | ○                        | ●                            | ●                         | ●                            | ○                            | ○                            | ●                 | ●                            |
| Windows drivers           | ●                        | ●                            | ●                         | ●                            | ●                            | ●                            | ●                 | ●                            |
| Windows NT drivers        | ●                        | ●                            | ●                         | Optional                     | ●                            | ●                            | ●                 | ●                            |
| OS/2 drivers              | ●                        | ●                            | ●                         | Optional                     | ●                            | ●                            | ●                 | ●                            |
| AutoCAD drivers           | ●                        | ●                            | ●                         | ●                            | ●                            | ●                            | ●                 | ●                            |

● = Yes ○ = No

## Graphics cards: a glossary

## Refresh Rate (or vertical scan rate)

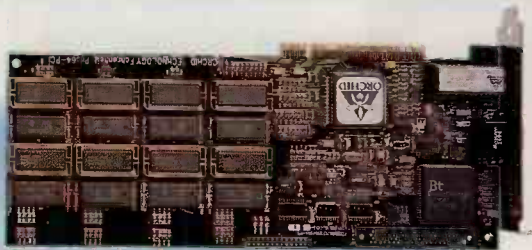
The frequency with which the whole screen is refreshed. At 60Hz (60 times a second) flicker is quite apparent. Above 72Hz the flicker appears to go away. Increasing the refresh rate above 72Hz makes the image increasingly solid.

## Horizontal scan rate

For each vertical pass the electron gun in the monitor has to scan side-to-side for every line of resolution. At VGA resolution this is 480 lines. Multiply this by the refresh rate and you get the total load on the monitor. This typically goes up to 64kHz, but is more for large, expensive screens.

## Interlacing

Where only every other line on the screen is refreshed with each pass. It is a way of increasing the colour depth or resolution if the card hasn't the muscle to do the job properly. The



result is very flickery and certainly not recommended for long periods.

## Virtual desktop

When the card is capable of holding in its memory a resolution greater than that being displayed on screen, the monitor can act as a "window" onto a larger viewing area. Using this system you can pan across your "desktop".



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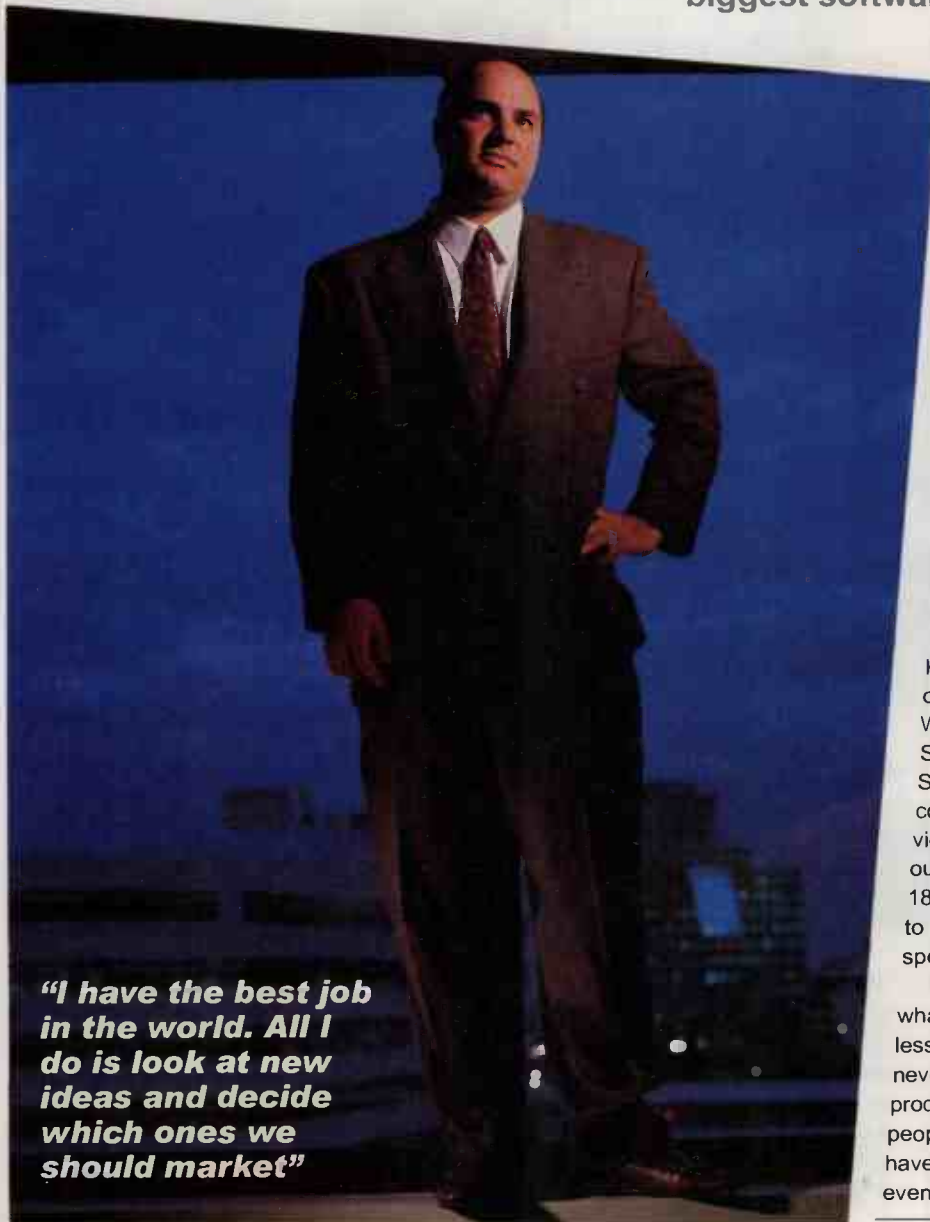
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# ROBIN HOOD RIDES AGAIN

It's the ability of Softkey to sell its products cut-price at K-Mart that inspired Kevin O'Leary to dub himself "the Robin Hood of software". Wendy M Grossman caught up with the founder and MD of the second biggest software company in the world.



***"I have the best job in the world. All I do is look at new ideas and decide which ones we should market"***

**M**any people had never heard of Softkey until mid-1993, when the announcement came that the then Softkey Products was merging with WordStar. And not just WordStar: shortly afterwards it announced a second merger with Spinnaker Software, manufacturer of PFS:Works, PFS:Window Works, Calendar Creator and Express Publisher. Now known as Softkey International, the company has since bought several small multimedia companies, including Compact and Aris.

But, says founder and president Kevin O'Leary, "we don't even consider ourselves to be a software company. We're basically an electronic publisher." Strange words, perhaps, considering that Softkey has moved into the number two consumer software slot now that the previous number two, Intuit, has been bought out by Microsoft. Softkey has more than 180 titles on the market, with distribution to mass retail outlets as well as software specialists.

"You have to put WordStar in context of what Softkey is today," says O'Leary. "It's less than four percent of our sales. It's never going to be the number one word processor again but it does make a lot of people very happy. A lot of solid core users have been using it for over ten years." It isn't even, he says, Softkey's most famous

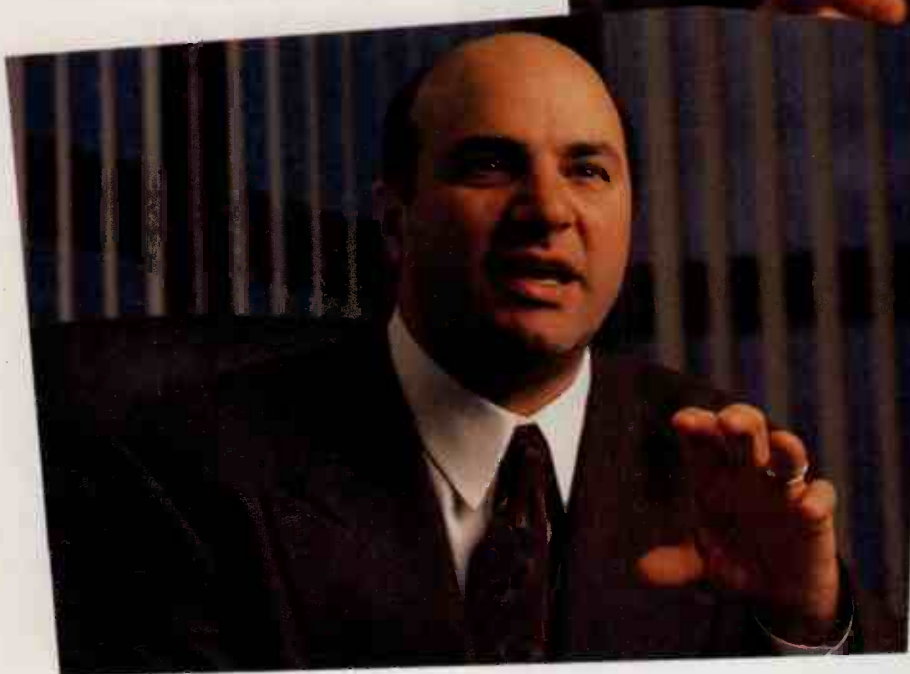
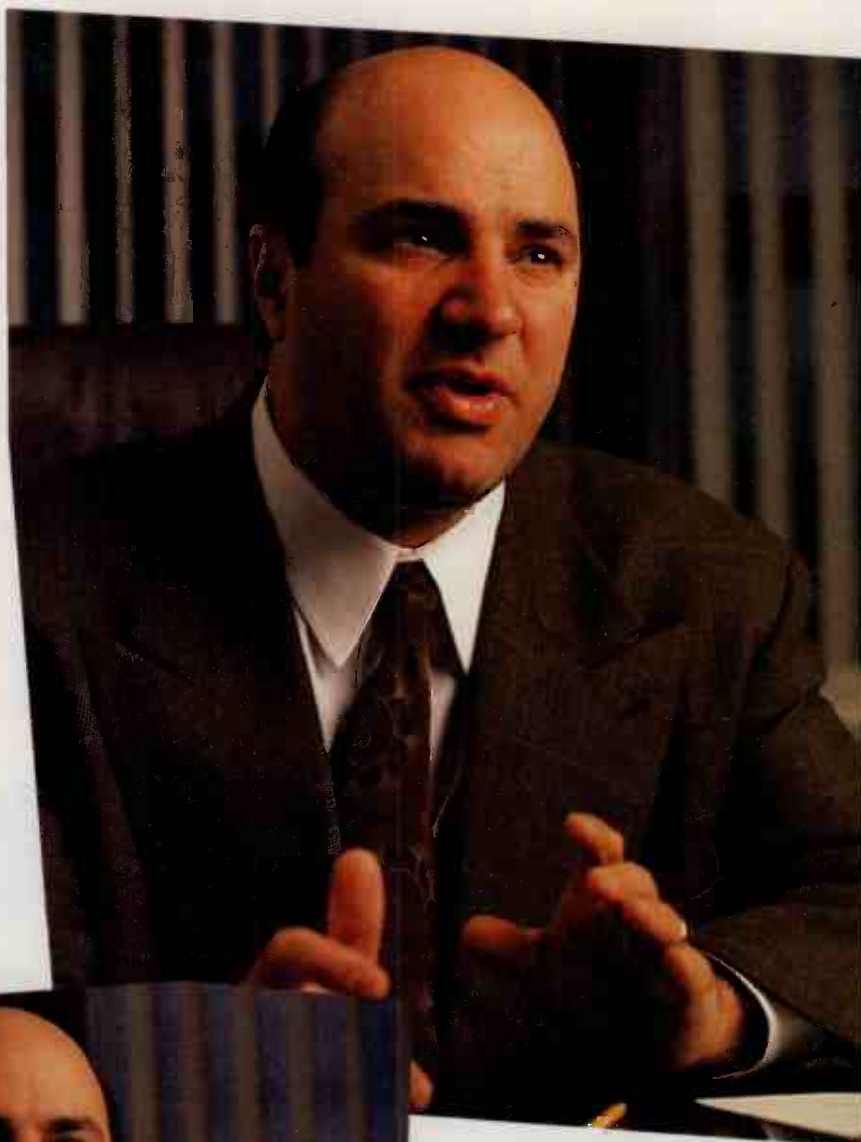


product: that's probably PC Paintbrush, a fancy version of the Paintbrush applet distributed with Windows. That's another one of those acquisition chains: PC Paintbrush was published by Zsoft, which WordStar bought in 1992.

All of which is quite impressive, really, for a company which originated in O'Leary's basement. Especially since prior to setting up in software, his career history spans TV and film production, plus a stint at Nabisco as assistant brand manager for pet food products. Born and raised in Montreal, he has an MBA from the University of Western Ontario and a BA and Hon BES from the University of Waterloo.

When the company started, it was selling vertical market software and experimenting with the first CD-i technology. This meant selling small, specialised products to "everybody from dentists to auto mechanics' shops". At the time, CD-i technology was analogue, not digital, but the company went public on the concept in 1986.

"We weren't successful in those years," admits O'Leary, "but we've learned an awful lot of things about the software business. Ten to twelve years later, CD-i has become a



reality in the form of CD-ROM. So I think we had our 'vision thing' right, it's just our timing that was wrong."

The decision to abandon vertical market software in favour of the consumer market took time. "One part of our business, even back then, was consumer products, which we were selling for \$99.

They continued to sell. No matter what else we did, they were always making money for us." This was in the CP/M and early MSDOS days. The company started by selling software for the Osborne, and then moved over to the first IBM and Apple machines. It wasn't until the mid to late eighties that things started to take off.

A lot of the company's growth has been through acquisitions but some of its success has come from Canadian tax software: it owns six different brands. In the US, Softkey sold its tax product, Easy Tax, to Computer Associates, which relaunched the product last year under the name Simply Tax.

"In that market you have to compete with Intuit and H&R Block and we don't really want to do that," says O'Leary. "There are three Titans battling for market share. That's not Softkey's operation at the moment. We prefer to find our own niches."

Softkey's next goal is to bring out a line of low-cost CD-ROMs. It is prototyping a rack of 24 new titles, which should be out in the US by the time you read this, at only \$12.99 — the same price as audio CDs. "I'm the Robin Hood of software," O'Leary says: he's really excited about the prospect of selling software that cheap. "We did a test in 42 stores in Canada, and the sell-through numbers





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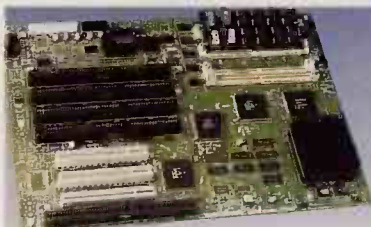
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were phenomenal."

The plan now is to test the concept in 2,000 to 3,000 locations in the US, with the aim of taking it international. O'Leary doesn't say, though, what prices might be like in the UK if and when that happens. He believes that software will be collected, just as records and books are, and sees pricing at similar levels as a key to making that happen.

The obvious question is, how can the company afford to develop and sell software at these prices? Standard office

created the Sports Illustrated Swimsuit Edition. Some code bases create 15 spin-offs, so that you have slight modifications to create completely different products in completely different categories at completely different price points; for example Calendar Creator at \$49.95, Instant Calendar at \$19.95, the Sports Illustrated Calendar at \$29.95 and the Softkey Platinum Calendar at \$12.99. They're all derivatives of the same source code base." The result of all this re-use, he says, is that the company spends only

brand of detergent... do you think they actually spin another detergent?" He points to Softkey's stock prices as extra evidence of the company's performance. "That's important, because you need a lot of capital to continue in this business," he says.

This is especially important now, he says, as the business is changing and consolidating. He believes that in five years' time there will only be two or three software companies left. One, for sure, is Microsoft. The other(s), he declines to

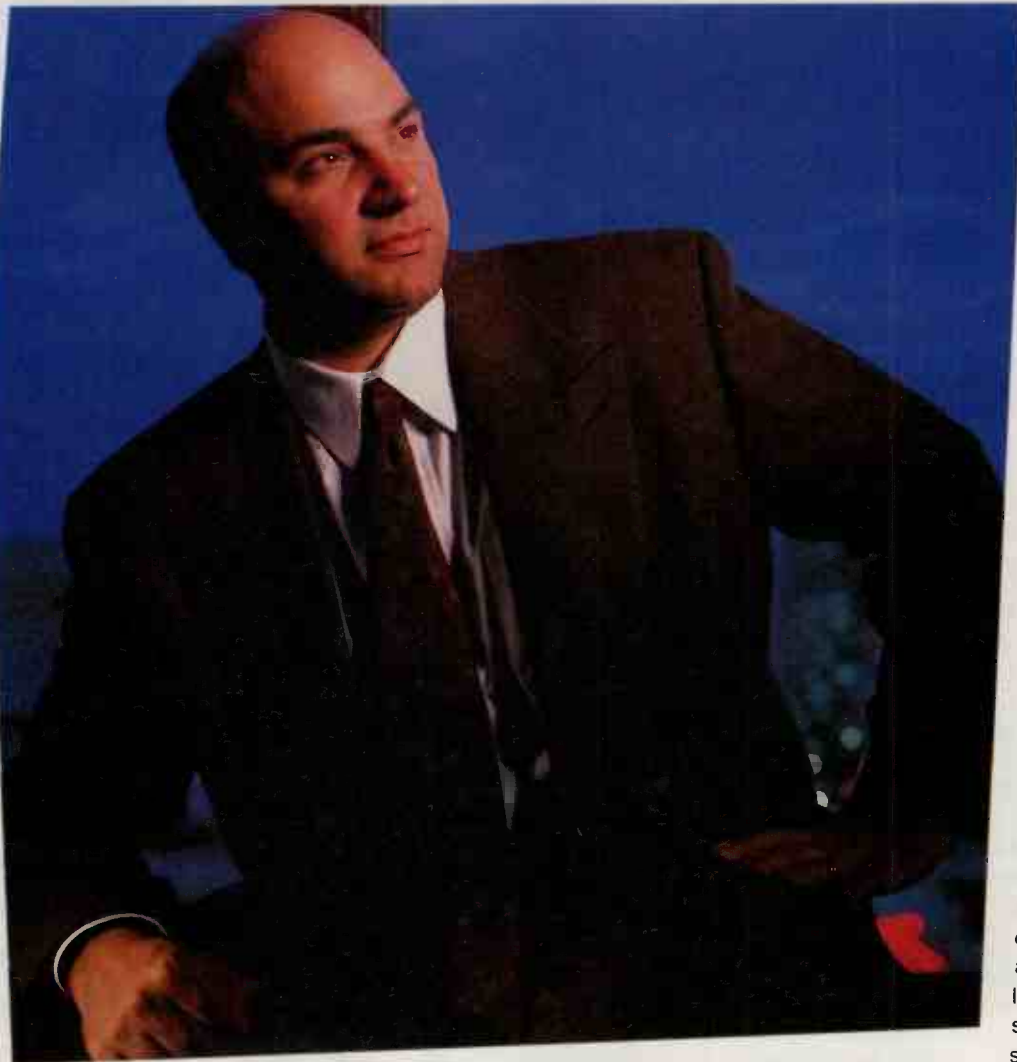
predict. "The economics don't allow any more for small software companies. Anything under \$15 million in sales is going to have a hard time staying profitable."

He modifies this slightly, admitting it might be possible for some companies to survive in particular market niches, but he himself would not invest in a company whose strategy was to remain small. Small companies, he believes, will face two problems: one is the way technology is developing, the other is access to distribution.

Let's take technological development first. O'Leary says: "As the platforms get easier to use, the underlying code gets more complicated in some cases. This next jump to Chicago means that small software companies are going to have to invest a lot more to support all its features and functionality. OLE 2.0 is not an easy thing to work with when you're developing for it: you have to invest more to make the product seamless under that environment. We're going to see a lot more reliance on larger publishers to provide a lot of the source code and overhead work so that the small authors don't

have to reinvent the wheel on a lot of this code base. Small is not pretty in the consumer market."

The other problem is that of access to distribution, something which happens in any mass market — look how hard it is for small record companies or publishers to get their products into the chain stores. Softkey sells its products in places like Wal-Mart and K-Mart, stores where people go looking for discount pricing on everything from toothpaste to clothing, to



software may have come down a lot in price, but we're always being reminded by the big companies how expensive development is.

"We have a new economic model for the consumer software business," is O'Leary's reply. "One of the biggest competitive advantages Softkey has is our leveraged core technology. Take Calendar Creator, a \$5 million product for us with the same source code that

about eight percent of its revenue on research and development where most of its competitors spend 22 percent.

"And yet our products are winning as many awards in terms of technology," O'Leary says. "What that tells you is that we are being much more efficient at managing the branding of those things." This is one of those areas where he likes to use other consumer industries as a model: "If you're Proctor & Gamble, and you have Tide and you have a generic





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"The barriers to entry are going up: it's hard to get distribution. Most of the people we see are companies that are \$3 to \$50 million in sales and they can't expand. What happens as products become commodities is that the base of business begins to shift from smaller speciality retailers to large mass merchants. It's hard to sell to Wal-Mart if you're small." A company with only five or six products can't handle a situation where they're placed in a major retailer and don't sell, so they lose that channel of distribution.

Another danger for niche software companies is that their market may disappear. Zsoft's well designed Zetafax, for instance, was one of the products dropped after the merger. "A strategy that dictates staying in one area of software and not diversifying is very dangerous." There are plenty of products that look promising for, say, nine months and then fizzle out, just as others the company has launched stay successful for years.

"When we launch new titles, our percentages are like this: two become A's — hits; two become B+ — very profitable, but not the same momentum; two are C's — losers." Even if the company loses its investment in the latter two products, it's still making money 80 percent of the time. "That portfolio approach is what has allowed Softkey to become successful." Individual failures can't hurt you, says O'Leary, but successes "are like a school of fish — swimming together they become a larger entity and they help in each other's success."

"We tend not to take risks on products that are unproven. We mine new ideas by publishing products, and when they become hits we internalise their development."

So: "If you come to me and say, I need a million dollars to develop this, I'll say no, thank you. But if you come to me with it half-finished, or finished, or have a budget of \$50,000 to finish it off, I'll probably finance it." On the floor of O'Leary's office is a line of boxes — mock-ups, finished products — waiting to be tried out. About 90 percent won't make it.

The plan for 1995 is to double — to 40 per quarter — the number of titles published in 1994, focusing much more on the "edutainment" market: products like Bodyworks that are meant to

educate while being fun to explore. As you'd expect, usability is a big issue. Softkey carries out usability testing and uses focus groups and, most of all, the complaints called into its technical support lines, to find the areas where it needs to improve its products' interfaces.

Longer term, O'Leary is less specific, although, he believes: "Ultimately, the traditional publishers, who own the content, will own the business. In five years, most of the software companies will have gone the way of Pearsons and Toolworks." (The Pearson Group, which owns Penguin, Longman, Addison-Wesley, the Financial Times, Madame Tussaud's and Thames Television, bought Software Toolworks, one of the

first and largest multimedia CD-ROM companies, in May 1994.)

"I feel very lucky and privileged to have been around at the beginning of the software business, to have enjoyed starting a company and growing it," says O'Leary. Opportunities like these are thin on the ground today, he says, and in the next decade they will be almost solely confined to divisions of larger companies.

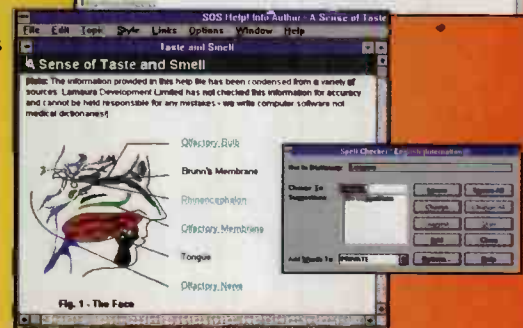
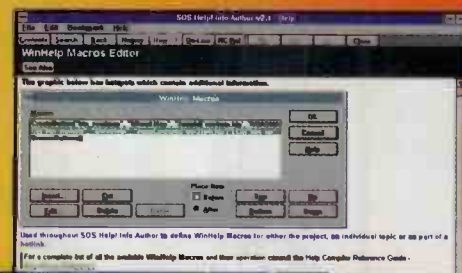
There will, of course, be new opportunities as technology evolves, but we can't guess what they will be. For now, O'Leary is as happy as Larry. "I have the best job in the world. All I do is look at new ideas and decide which ones we should market. I love software, and this is a chance to relish it."

PCW





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|    | <u>P</u> rice List         | Keep staff in touch with your latest prices                               |        |       |      |
|    | <u>P</u> arts List         | Equip staff with a parts list to save time and money for a better service |        |       |      |
|    | <u>N</u> otepad            | Run any Windows .EXE file direct from this menu                           |        |       |      |
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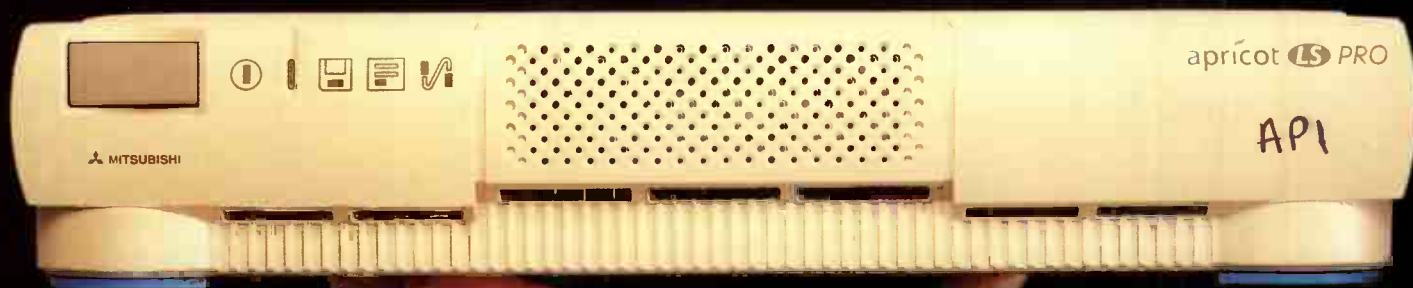
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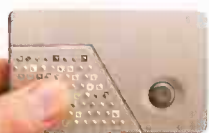
*LOC™ Technology security with full control over peripherals, timed access and advanced password management. Like the latest high performance parallel port delivering four times the performance of conventional ports.*

*And if you're wondering whether all this integration reduces your expansion opportunities, take a look at the back of the LS Pro and the two hot-pluggable PCMCIA slots (Type 2 & 3) for plug-and-go integration of fax modems, removable hard drives, flash memory, SCSI devices - and so on.*

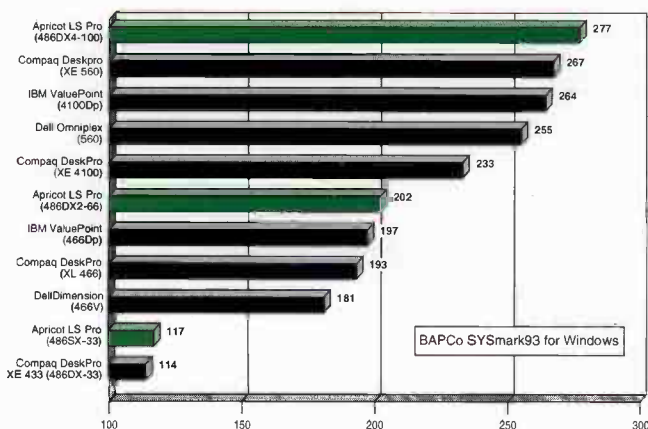
*Final proof of its superiority is confirmed by the BAPCo™ benchmark results which rate the LS Pro as the fastest PC in the world in each processor category.*

*All of which, with a starting price that's less than many standard PCs, should make it more than worth a call to Apricot for the name of your nearest dealer.*

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In the February issue of PC Magazine, Apricot's new LS Pro was Editor's Choice when tested alongside sixteen rivals, including systems from IBM, Hewlett Packard, Elonex and Dell.

*"There were sixteen LAN workstations in this review, but there was only ever going to be one winner - the Apricot LS Pro"*

*"...the LS Pro is designed from the ground up for life on the LAN and provides excellent performance together with an impressive array of extra features. The small size of the LS Pro's case belies the quality of its construction and Apricot manages to cram a great deal into a small space."*

*"With video, 32-bit Ethernet and sound all integrated onto the motherboard, the standard specification is very high indeed and gives excellent value for money."*



February 1995  
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# Fax and figures

**Faxmodems let you send faxes directly from your computer, via a modem, affording you the luxury of no more paper jams or queues at the office fax machine. Geoff Marshall has the facts on 16 current offerings.**

**S**ince the US company Touchbase began selling the first pocket faxmodem as recently as 1988, the concept of a modem with the added functionality of fax has taken off. Seven years later, there is now a wide range of competitively priced products to choose from, and plenty of good quality, easy to use software readily available for Windows and DOS users. Delrina's Winfax Pro software, which has recently reached version 4.0, dominates the Windows market.

Compared with a standalone fax machine, a faxmodem has the advantage of being able to fax directly from an application without first printing out the information to be faxed. This makes for better quality faxes and saves forests as well as avoiding paper-jams in both printer and fax machine.

Another advantage of computer-based faxmodem technology is that you can automate the sending of fax mailshots, which can be automatically personalised by the fax software application. You can also avoid the queue at the fax machine, and schedule faxes to be sent when off-peak telephone rates apply. With a faxmodem, incoming faxes may be spooled to the hard disk for viewing on the computer screen later — saving more forests — or automatically printed out via the computer's printer. If you already have a computer and a laser printer, the purchase of a faxmodem can be a very cheap way of obtaining the luxury of a "plain-paper fax machine". However, unless you also have a scanner, a faxmodem cannot send anything which you have not created on your computer.

Faxmodems do present problems which are generally greater than would be experienced with a conventional standalone Group 3 fax machine under the same conditions, largely because a faxmodem has to do something which fax machines do not: with faxmodems there must be a standardised means of interfacing modem hardware and fax software. Because manufacturers sometimes misinterpret the standards defined to facilitate this interface, or simply cut corners, the basis for communication between modem hardware and fax software can break down.

Unfortunately, things don't stop with the issue of standards and compatibility. Another major headache for users is that a portable faxmodem approved for use in the UK cannot

legally be used abroad. This is down to differences between countries in dial tones, transmit levels and the requirement in some countries, including the UK, that the software should not be able to set up transmit levels inappropriate to that country. The EC is looking carefully at this issue, so problems in Europe should be solved within a few years. However, the possibility of this also extending to the US seems remote at present.

Legally all modems, whether data or fax, need approval to be connected to the phone network. Approval comes from the British Approvals Board for Telecommunications (BABT) which tests that modems will work safely on the phone line and allows the manufacturer to display the "BABT-approved" sticker.

Broadly speaking, the range of faxmodem hardware available ranges from credit card-sized PCMCIA cards for use mainly with notebooks to fully fledged desktop modems which include fax capability almost as a useful afterthought. In the middle lie the majority of products, which exploit the portable faxmodem feature as their main selling point. In addition to their fax capability, the latter are also capable of functioning as data modems although they are often marketed primarily for their fax functionality.

Prices range enormously, and paying more does not seem to guarantee better value for money, but faxmodems which also incorporate fast data handling are sold at a price premium. If the ability to send faxes (rather than data) is a primary concern, then shopping at the lower end of the price scale should be perfectly adequate. All the modems tested support the faster V.17 fax standard and both Class 1 and Class 2 fax standards, unless otherwise stated. Where we have tested a fast V.34 product, most manufacturers also have a cheaper V.32bis product with identical fax features.

If high-speed data operation is also important, you should note that Rockwell-based V.34 products are also backwardly compatible with all slower ITU-T standards plus Rockwell's proprietary V.Fast Class (but not AT&T's proprietary V.32terbo). AT&T-based modems have the same backwards compatibility with ITU-T, but support V.32terbo instead of V.Fast Class. Only US Robotics' V.34 products can provide V.32terbo and V.Fast Class in the same modem because US Robotics licensed the proprietary code rather than purchasing the chipset from these modem Silicon suppliers.





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## PCMCIA Modems

## Intertex IX34 PCMCIA



Interfax was the first supplier to send us a PCMCIA V.34 modem for testing. It is not BABT approved at the time we went to press, but it should be by the time you read this. Based on the Rockwell chipset, the modem's firmware is held in Flash memory so can be easily upgraded to cope with bug-fixes or desirable changes in default configurations such as the MNP10/V.42bis one mentioned in the review of Interfax's desktop product.

It features remote configuration, dial-back and password security. It also supports the Hayes Autosync protocol which permits the use of synchronous terminal

emulation packages necessary for accessing IBM mainframe and minicomputers. Transend fax and data software is bundled.

## PCW Details

## Interfax IX34 PCMCIA

**Verdict** Excellent value for money for a V.34 PCMCIA fax/data modem.

**Street Price** £299

**List Price** £299

**Contact** 01784 421123.

**Fax** 01784 421910



## Lasat Credit 144 Faxmodem



Although not quite as stylish as its pocket modem sibling, this credit-card device has a unique feature among PCMCIA modems: two small LEDs to give information about the progress of a call. The DTR lamp lights up when your comms software is addressing the correct virtual serial port, while the DCD lamp indicates when a connection to a remote modem or fax machine is made. These tiny lamps are not in the card itself; rather they are installed in the Data Access Arrangement (DAA), which is the plastic housing, essential for BABT

approval, half-way down the telephone cable. As with the pocket variant, Trio Datafax Lite for Windows is bundled.

## PCW Details

## Lasat Credit 144 Faxmodem

**Verdict** Performance lives up to the expectations inspired by its excellent build quality.

**Street Price** £217

**List Price** £299

**Contact** 0181 741 8011.

**Fax** 0181 741 5296



## Portable Add-ons 28.8



Based on the Rockwell chipset, this V.34 PCMCIA modem provides the MNP10 protocol which is useful for cellular operation. An additional feature is IBM 5250/3270 connectivity which, with suitable software, allows remote access to IBM mainframes and minicomputers. It has a 20-number dialling directory and a full range of security features.

Portable Add-ons specialises in PCMCIA technology and is therefore in an excellent position to provide expert assistance in solving PCMCIA compatibility problems.

For those who do not require high-speed data, there are two cheaper

PCMCIA versions, the 14.4 (which has V.32bis) at £249, and the 24/96 (which features V.22bis and 9,600bits/sec fax) at £179.

## PCW Details

## Portable Add-ons 28.8

**Verdict** A very fast PCMCIA fax and data modem at a reasonable price.

**Street Price** £399

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**Contact** 01483 440777.

**Fax** 01483 452304





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### Pace Microlin fx32 NB



All Pace's products are based on the Rockwell chipset and this PCMCIA modem has the same features as Pace's pocket modem including all security and remote configuration facilities. The version tested supported V.32bis data operation at 14,400bits/sec as well as fax, but slower (V.22bis) and faster (V.34) versions are available at appropriate prices.

Pace provides clear PCMCIA-specific instructions and easy-to-use PCMCIA configuration software. The general standard of documentation with Pace products is excellent. The bundled software is

Winfax and Dosfax for fax, and Comit for data. Pace has always provided good value for money and this product is no exception.

#### PCW Details

##### Pace Microlin fx32 NB

**Verdict** Excellent value for money for a 14,400bits/sec data and fax PCMCIA modem.

**Street Price** £190

**List Price** £249

**Contact** 01274 532000.

**Fax** 01274 537029

### Psion Dacom V.32bis Gold Card



This modem is housed in a very expensive-looking PCMCIA card with brushed aluminium gold-coloured surfaces. Psion prides itself on solving PCMCIA compatibility problems so after-sales service and support should be excellent. Psion supplies PCMCIA driver software and very good documentation. The bundled software is Winfax Lite.

Psion produces V.22bis, V.32bis and V.34 variants of this product at prices of £199, £370 and £499 respectively. All have fax functionality although the V.22bis product is limited to 9,600bits/sec for fax and, of course,

2,400bits/sec for data.

Although Psion produces quality products and provides excellent support, it charges a premium price.

#### PCW Details

##### Psion Dacom V.32bis Gold Card

**Verdict** Good quality and performance, but rather expensive.

**Street Price** £370

**List Price** £370

**Contact** 01908 261686.

**Fax** 01908 261688

### Pocket Modems

### Lasat Unique 144



We wouldn't be the first to compare this Danish manufacturer's stylish modems with Bang & Olufsen stereo systems. It has an aerodynamic wedge-shaped case with brushed aluminium panels and a touch-sensitive on/off switch. A small group of red LEDs is visible through the smoked-glass effect sloping front panel to complete the designer modem look.

Instead of the usual PP3 battery, common in pocket modems, this unit has an internal rechargeable Nickel-Cadmium battery. This battery arrangement does have the disadvantage that

you can't use standard disposable batteries if you run out of power a long way from a mains recharging point. It is bundled with Trio Datafax Lite for Windows.

#### PCW Details

##### Lasat Unique 144

**Verdict** Performance matches its good looks, at a reasonable price.

**Street Price** £217

**List Price** £299

**Contact** 0181 741 8011.

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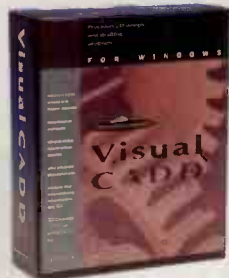
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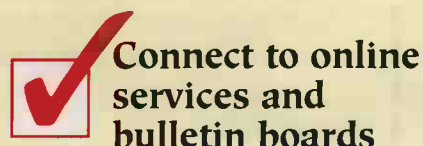
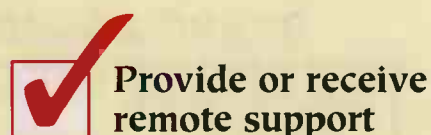
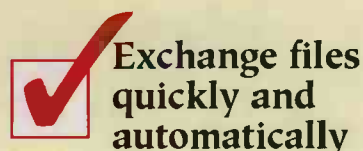
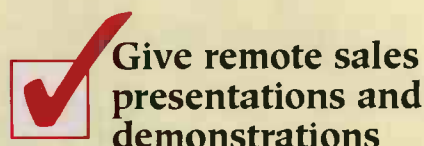
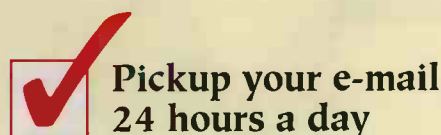
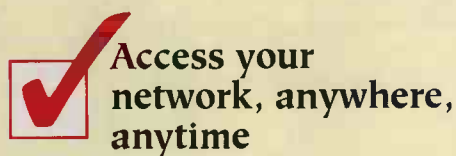
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System requirements: IBM-compatible 386+ PC; 8Mb memory recommended; Minimum 10Mb free hard disk space; Graphics board and monitor supported by Microsoft - Super VGA or greater recommended. Microsoft Windows compatible mouse or digitizer; MS-DOS or PC-DOS 3.3+ Version 5.0+ recommended for improved memory management. Windows 3.1+; (Optional) printer or plotter supported by Microsoft Windows. All Trademarks acknowledged.

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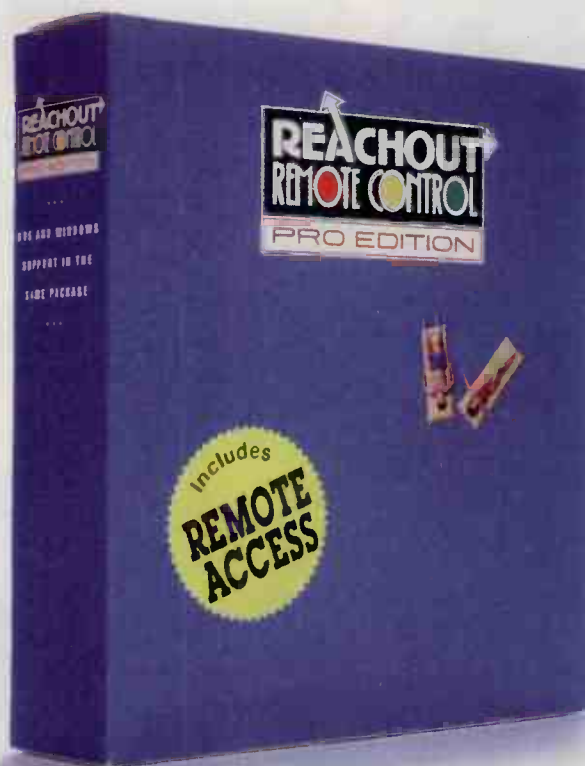
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**Multitech MT1432MK**

Like all Multitech modems, this V.32bis modem is based on AT&T's digital signal processor (DSP) chipset and has the special UUCP (Unix to Unix Copy Program) support unique to Multitech modems. Twelve LEDs provide comprehensive information on the status of the connection.

Also like other Multitech products, it lacks Class 1 fax features, having only EIA Class 2 fax functionality. It has a password-protected remote configuration mode but no other security features. As with its desktop modem, Multitech

bundles its own fax and data Windows software called MultiExpress. Multitech has considerably reduced the price of this modem in the last year, but it's still much too expensive.

**PCW Details****Multitech MT1432MK**

**Verdict** A good quality V.32bis data and faxmodem, but too expensive.

**Street Price** £350

**List Price** £499

**Contact** 01344 891266.

**Fax** 01344 891215

**Pace Microlin fx32 Plus**

The Microlin is housed in a slim pocket-sized case and powered by a PP3 battery or a mains adaptor. It has an on/off switch and four LED indicators for status information. The on/off switch and connectors for serial port and phone line are protected by a neat folding cover when not in use. On test the modem performed particularly reliably for both fax and data operation.

Password and dial-back security are featured with a 20-entry dial-back store holding twenty combinations of password and dial-back phone numbers. Password

security may be used without dial-back and a password-protected remote configuration facility is provided. The software bundled is Winfax and Dosfax for fax, and Comit for data.

**PCW Details****Pace Microlin fx32 Plus**

**Verdict** Excellent value for money for a 14,400bits/sec fax/data modem.

**Street Price** £165

**List Price** £199

**Contact** 01274 532000.

**Fax** 01274 537029

**Psion Dacom PDM60F**

This is an unusual-looking pocket modem with an LCD display and a very stylish appearance. Also unusual is its choice of battery power source — two AA-size penlight cells instead of the common PP3. This is actually quite a sensible departure from the norm because AA cells have a much higher power density than the PP3 which leads to lower battery costs and longer battery life. Rechargeable Nickel-Cadmium cells may also be used.

The LCD display is much more informative than the usual couple of LEDs

and performance is excellent. There are full security features including password protection with or without dial-back security. The bundled software is Winfax Lite.

**PCW Details****Psion Dacom PDM60F**

**Verdict** Good quality and performance, but expensive for a V.32bis fax and data modem.

**Street Price** £399

**List Price** £399

**Contact** 01908 261686.

**Fax** 01908 261688

**Tricom Traveller 34**

Another V.34 (28,800bits/sec) product based on the Rockwell chipset, Tricom modems have a unique feature of allowing connection to the PC via the parallel port as well as via the serial port. This is a neat way of avoiding the speed limitation in the serial port UART of most PCs. As this is a pocket modem it is likely to be used with a notebook computer, and the faster 16550 UARTs are still rare on notebooks. Neither have you the opportunity to fit a Hayes ESP card in a notebook.

This modem supports the MNP10 protocol and, on the fax side, only Class 2 operation. The bundled software is Winfax and Dosfax Lite.

**PCW Details****Tricom Traveller 34**

**Verdict** Rather expensive, but has the benefits of 28,800 data operation and the unique parallel port interface.

**Street Price** £549

**List Price** £549

**Contact** 01494 483951.

**Fax** 01494 485213





**US Robotics Worldport Dual Standard Cellular Fax**

This small pocket modem offers V.32terbo data performance and Class 1 only fax facilities. Four LED indicators display all important status information by a combination of changing colour and flashing on and off. US Robotics provides excellent documentation including a quick-start guide.

The modem also includes US Robotics' proprietary HST modulation scheme, and HST Cellular which is optimised for cellular data applications. HST is only effective if both communicating modems

support HST and therefore has no relevance to fax operation. The software which US Robotics bundles with its modems is called Quicklink 2.

**PCW Details****US Robotics Worldport Dual Standard Cellular Fax**

**Verdict** A neat pocket faxmodem with additional cellular data features.

**Street Price** £299

**List Price** £299

**Contact** 01753 811180.

**Fax** 01753 811191

**Desktop Modems****Hayes Optima 288 V.34 plus Fax**

The latest V.34 offering from Hayes, based on the Rockwell chipset, provides lightning fast 28,800bits/sec data performance. The Hayes modem is simple to use with no front-panel controls. It has eight informative LEDs on the front panel and an on/off switch on the back panel. The compact case consists of a combination of bright aluminium panels and black plastic.

The bundled software includes Hayes Smartcom LE for Windows and Hayes Smartcom Fax for Windows. For a modem which lacks remote

configuration, security features and network management facilities, it is rather expensive. While the lack of these features rule it out for some business users, it is particularly easy to set up for the non-technical user.

**PCW Details****Hayes Optima 288 V.34 plus Fax**

**Verdict** A compact, easy to use modem with good performance.

**Street Price** £399

**List Price** £499

**Contact** 01252 775500.

**Fax** 01252 775511

**Intertex IX34 Desktop**

Another product based on the Rockwell chipset, the desktop housing is so small that it could double up as a pocket modem, although there is no battery power option. It has ten LEDs and two pushbuttons on the front panel, and features remote configuration, dial-back and password security. Like its PCMCIA sibling, it supports the Hayes Autosync protocol useful for accessing IBM mainframes and minicomputers.

Since we last tested this product in the January issue, Intertex has changed the defaults for data operation from

MNP10 to V.42bis. This change has considerably improved the data throughput for compressible files. Transend fax and data software is bundled.

**PCW Details****Intertex IX34 Desktop**

**Verdict** A very fast, compact fax/data modem at a budget price.

**Street Price** £299

**List Price** £299

**Contact** 01784 421123.

**Fax** 01784 421910

**Multitech MT2834BLK**

This V.34 modem is based on AT&T's digital signal processor (DSP) chipset housed in a slim desktop case with an external mains transformer. It lacks Class 1 fax features, having only EIA Class 2 fax functionality. Fourteen LEDs provide comprehensive information on the status of the connection. Multitech bundles its own MultiExpress software for fax and data operation under Windows.

Unix users are provided for by a special feature to improve the speed of data transfers in the UUCP (Unix to Unix

Copy Program) environment. Remote configuration, remote network management and call-back security are provided, plus leased-line operation with dial restoral.

**PCW Details****Multitech MT2834BLK**

**Verdict** A high specification fax/data modem with all the features demanded by modern corporate users.

**Street Price** £499

**List Price** £699

**Contact** 01344 891266.

**Fax** 01344 891215





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### Sonix Volante Fast



This Sonix modem is based on the AT&T chipset and housed in an unusually styled upright case which makes it look like a small uninterruptible power supply. The Volante Fast is particularly easy to use and configure, using a special menu-driven setup program. It has an illuminated LCD panel and nine LEDs to provide comprehensive information on the progress of a call, line quality, and error conditions.

The firmware is held in Flash memory so is easily upgradable. If a modem is going to support only one fax standard

then Class 1 is the best one, and Sonix has chosen this compromise. The bundled software is Datatalk. Leased-line with dial-restoral costs £100 extra.

#### PCW Details

##### Sonix Volante Fast

**Verdict** An easy to set up fax/data modem with options aimed at the business user.

**Street Price** £795

**List Price** £795

**Contact** 01285 641651.

**Fax** 01285 642098



### US Robotics Courier V.34 Fax



Like other V.34 modems the Courier supports fall-back speeds down to 2,400bits/sec, but the Courier has an additional facility that allows the transmission speed to be different in each direction if the phone line has different levels of impairments in each transmission direction. US Robotics calls this unique feature Adaptive Speed Levelling (ASL). You can take advantage of ASL only if the modem at the other end of the connection is also a Courier with ASL.

Because US Robotics licensed the V.fast Class protocols from Rockwell,

rather than using the Rockwell chipset, this modem is also unique in supporting both V.fast Class and V.32terbo. Other features include remote configuration, password and dial-back security.

#### PCW Details

##### US Robotics Courier V.34 Fax

**Verdict** A versatile and cost-effective fax/data modem.

**Street Price** £399

**List Price** £399

**Contact** 01753 811180.

**Fax** 01753 811191



### How we did the tests

We used Delrina Winfax Pro version 4.0 to drive each of the faxmodems, selecting Class 1 operation for those modems which support both Class 1 and Class 2 standards. However, both Pace modems refused to work as a Class 1 device with Winfax Pro, although they worked fine when configured to work as Class 1 modems with three other software packages. The Pace modems were therefore tested in Class 2 mode. Although it is difficult to be certain, we feel that this problem was probably more the fault of Winfax than Pace.

We faxed directly from Microsoft Write running under Windows for Workgroups 3.11 on a 486/100MHz IBM ThinkPad fitted with 16Mb RAM. We did not use the facility to fax directly from WFW's email module as this introduces the additional overhead of converting the document via the intermediate .DCX format (in case it

needs to be emailed).

For the fax transmission tests we used Winfax Pro to send a five-page fax automatically to three different fax machines, timing

each transmission. For the fax reception tests we used Winfax Pro to receive a five-page fax from three different fax machines spooling the received faxes to hard disk.

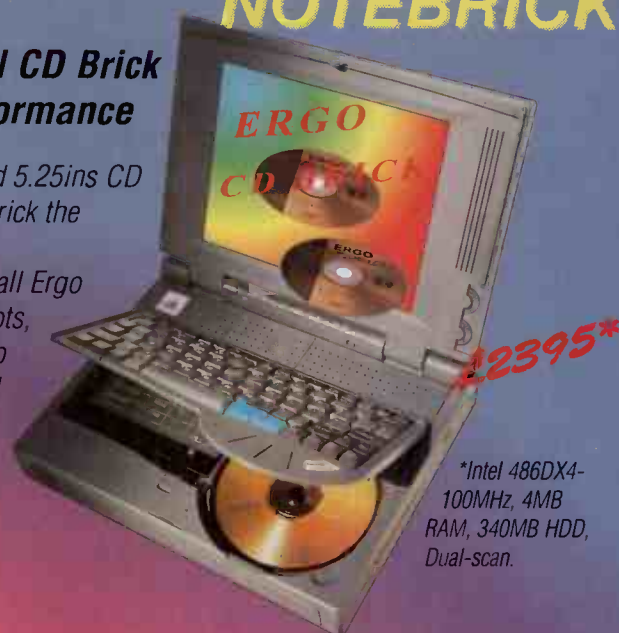




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\*Intel 486DX4-100MHz, 4MB RAM, 340MB HDD, Dual-scan.

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## Ergo's Pentium P-90 Notebook

The EnergyBrick Pentium 90 Mhz 3.3Volt Notebook offers the ultimate in portable power with a specification matching the very best of desktop Pentium computers. Reviewed by PC Direct in October '94 as a DX4-100MHz offering "many features usually only found in Powerful desktop machines". On the road you have 810MB Hard disk capacity, full Local Bus technology, Graphics accelerator, PCMCIA III and a 16-Bit sound system. In the office the 4 slot docking station (2 VESA) also has built in SCSI, Stereo Speakers, and 3.5ins and 5.25ins drive bays ensuring you stay on top of your desk bound cousins!

\*Intel Pentium 90MHz, 8MB RAM, 340MB HDD, Dual-scan.

## Ergo 486DX4-100MHz 3.3Volt Colour PowerBrick

Highly commended in August '94 edition of Personal Computer World and the overall fastest of 40 notebooks in March 95 it is not surprising that PC Magazine described it "as appealing to power users who need both speed and screen quality", the exceptionally well engineered PowerBrick with its Intel 486DX4-100 CPU is a thoroughbred amongst notebooks. It's now been upgraded to include the new 16-bit Sound System sampling at 44kHz, and enhanced IDE and Parallel Interfaces. Also the Local Bus Western Digital 90C30 accelerated graphics controller the PowerBrick has outstanding video performance rated at 18 million Winmarks! Besides the two PCMCIA slots the PowerBrick comes with optional internal 14,400 fax Modem, and up to 32 MB bytes of RAM.



\*Intel 486DX4-100MHz, 4MB RAM, 340MB HDD, Active TFT. All prices plus VAT.

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TABLE OF FEATURES DESKTOP MODEMS

● = Yes  
○ = No

| Model                                   | InterTrex<br>IX34 Desktop | Hayes<br>Optima 288 V.34/Fax | MultiTech<br>MT2834BLK | Sonix<br>Volante Fast | US Robotics<br>Courier V.34 Fax |
|---|---------------------------|------------------------------|------------------------|-----------------------|---------------------------------|
| Telephone                               | 01784 421123              | 01252 775500                 | 01344 891266           | 01285 641 651         | 01753 811180                    |
| Fax                                     | 01784 421910              | 01252 775511                 | 01344 891215           | 01285 642 098         | 01753 811191                    |
| MNP Level 5                             | ●                         | ●                            | ●                      | ●                     | ●                               |
| MNP Level 10                            | ●                         | ●                            | ○                      | ○                     | ○                               |
| V.21                                    | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.22                                    | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.22bis                                 | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.23                                    | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.25bis                                 | ●                         | ○                            | ●                      | ●                     | ●                               |
| V.25                                    | ●                         | ●                            | ○                      | ●                     | ●                               |
| V.32                                    | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.32bis                                 | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.32terbo                               | ○                         | ○                            | ●                      | ●                     | ●                               |
| V.fast class                            | ●                         | ●                            | ○                      | ○                     | ●                               |
| V.34                                    | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.42 error correction                   | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.42bis data compression                | ●                         | ●                            | ●                      | ●                     | ●                               |
| Autosync                                | ●                         | ●                            | ○                      | ○                     | ○                               |
| Automatic fall-back/forward online      | ●                         | ●                            | ●                      | ●                     | ●                               |
| Synchronous DTE working                 | ●                         | ●                            | ●                      | ●                     | ●                               |
| Max DTE working (bits/sec)              | 115200                    | 230400                       | 115200                 | 115200                | 115200                          |
| Max DCE speed for data                  | 28800                     | 28800                        | 28800                  | 33600                 | 28800                           |
| Remote configuration                    | ●                         | ○                            | ●                      | ●                     | ●                               |
| No. of user configurations              | 2                         | 2                            | 1                      | 6                     | 1                               |
| No. of security callback (s.c.)(tel.ms) | 20                        | 0                            | 30                     | 20                    | 10                              |
| No. of user tel.ms                      | 20                        | 4                            | 10                     | 20                    | 10                              |
| V.17                                    | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.27 ter                                | ●                         | ●                            | ●                      | ●                     | ●                               |
| V.29                                    | ●                         | ●                            | ●                      | ●                     | ●                               |
| TIA/EIA Class 1                         | ●                         | ●                            | ○                      | ●                     | ●                               |
| TIA/EIA Class 2                         | ●                         | ●                            | ●                      | ○                     | ●                               |
| Chipset                                 | Rockwell RC 288 DPi       | Rockwell RC 288 DPi          | AT&T                   | Sonix Code AT&T dsp   | USR                             |
| Which fax software supplied?            | Transend WinDos Lite      | Smartcom Fax                 | MultiExpress fax       | Datafax for Windows   | QuickLink II                    |
| Which data software supplied?           | As above                  | Smartcon LE                  | MultiExpress Comms     | Datafax for Windows   | QuickLink II                    |
| Internal speaker                        | ●                         | ●                            | ●                      | ●                     | ●                               |
| Power on/off switch                     | ●                         | ●                            | ●                      | ●                     | ●                               |
| Telephone handset connectors            | ●                         | ●                            | ○                      | ●                     | ○                               |
| DTR low sleep mode                      | ○                         | ○                            | ○                      | ○                     | ○                               |
| Number of indicators                    | 10 plus 3 digit display   | 8                            | 14                     | 9 plus LCD            | 12                              |
| Firmware in Flash memory                | ○                         | ○                            | ●                      | ●                     | ●                               |
| BABT approved                           | ●                         | ●                            | ●                      | ●                     | ●                               |
| Dimensions                              | 25 x 130 x 180            | 25 x 150 x 256               | 40 x 155 x 230         | 90 x 150 x 280        | 35 x 162 x 285                  |
| Weight (grams)                          | 280                       | 200                          | 900                    | 1300                  | 660                             |
| List price £                            | 299                       | 499                          | 699                    | 795                   | 399                             |
| Street price £                          | 299                       | 399                          | 499                    | 595                   | 399                             |

## First Class Ticket: the difference between Class 1 and Class 2

The most important fax standards are the EIA (Electrical Industrial Association) Class 1 and Class 2. The difference between Class 1 and Class 2 is not easy to explain, but briefly: Class 1 modems delegate more of the supervision of the negotiation and fax intelligence to the software in the PC. This delegated functionality is called "session management" and is embodied in ITU-T standard T.30, which defines the protocols to be used for setting up the

communications between two fax devices and negotiating a mutually compatible subset of the various speed, compression, and other facilities implemented in each.

Class 2 includes T.30 session management inside the modem, relieving the software of this task. With both Class 1 and Class 2, the software must carry out the image data preparation defined in ITU-T standard T.4.

Class 1 and Class 2 capability should not be confused with Group 3, which relates also to actual fax machines. Group 3 fax is

effectively the T.4 standard, but it relies on T.30 also being present. T.30 in turn determines which ITU-T V-standards are supported for modulation — V.27ter, V.29 or V.17. The fastest of these is V.17 which provides up to 14,400bits/sec transfer of fax data on the telephone line. V.29 is the common 9,600bits/sec standard, while V.27ter provides 4,800bits/sec with fall-back to 2,400bits/sec on poor telephone lines.

The Class 1 standard was finalised in October 1990. The EIA set about addressing



TABLE OF FEATURES PCMCIA MODEMS

● = Yes  
○ = No

| Model                                   | Intertex<br>IX34 PCMCIA | Lasat<br>Credit 144 Faxmodem | Pace<br>Microlin fx32 NB | Portable<br>Add-ons<br>28.8 | Psion Dacom<br>V.32bis Gold Card |
|---|-------------------------|------------------------------|--------------------------|-----------------------------|----------------------------------|
| Telephone                               | 01784 421123            | 0181 741 8011                | 01274 532000             | 01483 440777                | 01908 261686                     |
| Fax                                     | 01784 421910            | 0181 741 5296                | 01274 532029             | 01483 452304                | 01908 261688                     |
| MNP Level 5                             | ●                       | ●                            | ●                        | ●                           | ●                                |
| MNP Level 10                            | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.21                                    | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.22                                    | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.22bis                                 | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.23                                    | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.25bis                                 | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.25                                    | ●                       | ○                            | ●                        | ●                           | ●                                |
| V.32                                    | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.32bis                                 | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.32terbo                               | ○                       | ○                            | ○                        | ○                           | ○                                |
| V.fast class                            | ●                       | ○                            | ○                        | ●                           | ○                                |
| V.34                                    | ●                       | ○                            | ○                        | ●                           | ○                                |
| V.42 error correction                   | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.42 bis data compression               | ●                       | ●                            | ●                        | ●                           | ●                                |
| Autosync                                | ●                       | ●                            | ○                        | ●                           | ●                                |
| Automatic fall-back/forward online      | ●                       | ●                            | ●                        | ●                           | ●                                |
| Synchronous DTE working                 | ●                       | ●                            | ●                        | ●                           | ○                                |
| Max. DTE working                        | 115200                  | 57600                        | 57600                    | 115200                      | 57600                            |
| Max. DCE speed for data                 | 28800                   | 14400                        | 14400                    | 28800                       | 14400                            |
| Remote configuration                    | ●                       | ●                            | ●                        | ●                           | ○                                |
| No. of user configurations              | 2                       | 2                            | 2                        | 2                           | 15                               |
| No. of security callback (s.c) (tel.ms) | 20                      | 20                           | 20                       | 20                          | 15                               |
| No. of user tel.ms                      | 20                      | 20                           | 20                       | 20                          | 15                               |
| V.17                                    | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.27ter                                 | ●                       | ●                            | ●                        | ●                           | ●                                |
| V.29                                    | ●                       | ●                            | ●                        | ●                           | ●                                |
| TIA/EIA Class 1                         | ●                       | ●                            | ●                        | ●                           | ●                                |
| TIA/EIA Class 2                         | ●                       | ●                            | ●                        | ●                           | ●                                |
| Chipset                                 | Rockwell RC 288 DPi     | Rockwell                     | Rockwell 144ACLW         | Rockwell RC 288 DPi         | Rockwell RC144DPL                |
| Which fax software supplied?            | Transend WinDos Lite    | DeIrina WinFax               | Winfax/Dosfax            | Transend WinDos Lite        | WinFax Lite                      |
| Which data software supplied?           | Transend                | None                         | COMIT                    | Transend                    | None                             |
| Internal speaker                        | ○                       | ○                            | ○                        | ○                           | ○                                |
| Power on/off switch                     | ○                       | ○                            | ○                        | ○                           | ○                                |
| Telephone handset connector             | ○                       | ○                            | ○                        | ○                           | ○                                |
| DTR low sleep mode                      | ●                       | ●                            | ●                        | ●                           | ●                                |
| No. of indicators                       | 0                       | 2                            | 0                        | 0                           | 0                                |
| Firmware in Flash memory                | ●                       | ○                            | ○                        | ●                           | ○                                |
| BABT approved                           | ●                       | ●                            | ●                        | ●                           | ●                                |
| Dimensions (mm)                         | 5 x 53 x 85             | 5 x 53 x 85                  | 5 x 53 x 85              | 5 x 53 x 85                 | 5 x 53 x 85                      |
| Weight (grams)                          | 10                      | 10                           | 10                       | 10                          | 10                               |
| List price £                            | 299                     | 299                          | 249                      | 299                         | 299                              |
| Street price £                          | 299                     | 217                          | 199                      | 299                         | 299                              |

the Class 2 standardisation by producing in August 1990 a draft standard. This was followed by a second draft in August 1991 incorporating comments received and some simplification of the command structure.

Unfortunately, a lot of modem manufacturers and software houses had become impatient and had already implemented the first draft, and this became a *de facto* standard. Very few manufacturers implemented the second draft, but there was a third draft dated 13th March 1992 and the standard

was finally approved in September 1992. This final standard is referred to as Class 2.0 to distinguish it from the *de facto* implementation of the first draft which is generally called Class 2.

Class 2 is a far more complex standard to implement than Class 1. For modem manufacturers and software vendors alike it has been like trying to hit a moving target as the draft standard has gone through so many revisions. With Class 1 there is far less for the hardware manufacturer to get wrong, but

the onus for functional reliability falls on the software vendor.

Class 1 is a much simpler standard, so there's much less to get wrong. It's also cheaper to implement. If you choose a poor Class 2 modem, any problems will be much more difficult to fix with software workarounds.

But if you choose a Class 1 modem, it's almost impossible to pick a bad one — at least as far as the fax operation is concerned. The functionality you get depends more on the software you use than on the modem.





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TABLE OF FEATURES POCKET MODEMS

● = Yes  
○ = No

| Model                                  | Lasat          | MultiTech        | Pace               | Psion Dacom       | Tricom           | US Robotics  |
|--|----------------|------------------|--------------------|-------------------|------------------|--------------|
| Model                                  | Unique 144     | MT1432MK         | Microlin fx32 Plus | PDM60F            | Traveller 34     | WorldPort    |
| Telephone                              | 0181 741 8011  | 01344 891266     | 01274 532000       | 01908 261686      | 01494 483951     | 01753 811180 |
| Fax                                    | 0181 741 5296  | 01344 891215     | 01274 532029       | 01908 261688      | 01494 485213     | 01753 811191 |
| MNP Level 5                            | ●              | ●                | ●                  | ●                 | ●                | ●            |
| MNP Level 10                           | ●              | ○                | ●                  | ●                 | ●                | ○            |
| V.21                                   | ●              | ●                | ●                  | ●                 | ●                | ●            |
| V.22                                   | ●              | ●                | ●                  | ●                 | ●                | ●            |
| V.22bis                                | ●              | ●                | ●                  | ●                 | ●                | ●            |
| V.23                                   | ●              | ●                | ●                  | ●                 | ●                | ●            |
| V.25bis                                | ●              | ○                | ●                  | ●                 | ○                | ○            |
| V.25                                   | ○              | ○                | ●                  | ●                 | ○                | ○            |
| V.32                                   | ●              | ●                | ●                  | ●                 | ●                | ●            |
| V.32bis                                | ●              | ●                | ●                  | ●                 | ●                | ●            |
| V.32terbo                              | ○              | ○                | ○                  | ○                 | ○                | ●            |
| V.fast class                           | ○              | ○                | ○                  | ○                 | ●                | ○            |
| V.34                                   | ○              | ○                | ○                  | ○                 | ●                | ○            |
| V.42 error correction                  | ●              | ●                | ●                  | ●                 | ●                | ●            |
| V.42bis data compression               | ●              | ●                | ●                  | ●                 | ●                | ●            |
| Autosync                               | ●              | ○                | ○                  | ●                 | ○                | ○            |
| Automatic fall-back/forward online     | ●              | ●                | ●                  | ●                 | ●                | ●            |
| Synchronous DTE working                | ●              | ○                | ●                  | ○                 | ○                | ○            |
| Max. DTE working                       | 57600          | 57600            | 57600              | 57600             | 57600            | 115200       |
| Max. DCE speed                         | 14400          | 14400            | 14400              | 14400             | 28800            | 19200        |
| Remote configuration                   | ●              | ●                | ●                  | ○                 | ●                | ●            |
| No. of user configurations             | 2              | 1                | 2                  | 15                | 2                | 1            |
| No. of security callback (s.c)(tel.ms) | 20             | 30               | 20                 | 15                | 9                | 0            |
| No. of user tel.ms                     | 20             | 10               | 20                 | 15                | 9                | 0            |
| V.17                                   | ●              | ●                | ●                  | ●                 | ○                | ●            |
| V.27ter                                | ●              | ●                | ●                  | ●                 | ●                | ●            |
| V.29                                   | ●              | ●                | ●                  | ●                 | ●                | ●            |
| TIA/EIA Class 1                        | ●              | ○                | ●                  | ●                 | ●                | ●            |
| TIA/EIA Class 2                        | ●              | ●                | ●                  | ●                 | ●                | ●            |
| Chipset                                | Rockwell       | AT&T             | Rockwell 144ACLW   | Rockwell RC144DPL | Rockwell RC144DP | US Robotics  |
| Which fax software supplied?           | Delrina WinFax | MultiExpress Fax | Winfax/Dosfax      | WinFax Lite       | WinFax/DosFax    | QuickLink II |
| Which data software supplied?          | None           | MultiExpress Com | COMIT              | None              | None             | QuickLink II |
| Internal speaker                       | ●              | ●                | ●                  | ●                 | ●                | ●            |
| Power on/off switch                    | ●              | ●                | ●                  | ●                 | ●                | ○            |
| Telephone handset connector            | ○              | ○                | ○                  | ○                 | ○                | ○            |
| DTR low sleep mode                     | ●              | ●                | ●                  | ●                 | ●                | ●            |
| Number of indicators                   | 5              | 8                | 4                  | LCD Display       | 3                | 4            |
| Firmware in Flash memory               | ○              | ○                | ○                  | ○                 | ○                | ○            |
| BABT approved                          | ●              | ●                | ●                  | ●                 | ●                | ●            |
| Dimensions (mm)                        | 89 x 94 x 23   | 130 x 67 x 25    | 98 x 22 x 128      | 92 x 75 x 28      | 150 x 85 x 45    | 97 x 66 x 30 |
| Weight (grams)                         | 200            | 450              | 120                | 175               | 400              | 170          |
| List price £                           | 299            | 499              | 199                | 399               | 549              | 299          |
| Street price £                         | 217            | 350              | 165                | 399               | 549              | 299          |

## Editor's Choice

The Editor's Choice goes to the Pace Microlin fx32 Plus pocket modem, which is reliable and has greater functionality than many desktop products at an amazingly low street price of £165. None of the modems tested had any serious problems although some were not such good value for money, and the specifications were very varied so it was difficult to choose the runners-up. However, the following products deserve to be Highly Commended.

If you want a desktop fax modem, the Intertex IX34 at £299 brings 28,800bits/sec

performance at little more than 14,400bits/sec prices. It's hard to recommend any of the other V.34 desktop products tested as their prices are so much higher, but the US Robotics Courier offers the unique feature of compatibility with all previous standards including proprietary ones, and the Sonix modem provides the most features for corporate users and a very informative display of call progress information — albeit at the highest price.

If you want 28,800bits/sec in a pocket fax-modem, then there is no product in this group

test that is good value for money, although some of the manufacturers (such as Pace) which are represented in other categories have economical solutions for this requirement.

If you prefer a PCMCIA faxmodem, the Lasat Credit 144 Faxmodem, at a street price of £217, provides the best overall value for money and does data also at the respectable speed of 14,400bits/sec. If you need 28,800bits/sec (V.34) in a PCMCIA faxmodem, the Intertex IX34 PCMCIA offers the best value of those tested.





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June 1994

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COMPUTER BUYER  
November 1994

Western Systems Entertainer  
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PC MAGAZINE  
November 1994

Western Systems Crusader 486DX2-66  
The Western Systems Crusader  
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| HDD | MEMORY | 486SX2<br>50MHz | 486DX2<br>66MHz | 486DX4<br>100MHz |
|-----|--------|-----------------|-----------------|------------------|
| 420 | 8Mb    | 985             | 1050            | 1125             |
| 540 | 8Mb    | 1025            | 1090            | 1165             |
| 700 | 8Mb    | 1035            | 1100            | 1175             |
| 1Gb | 8Mb    | 1150            | 1215            | 1290             |

SCSI OPTIONS c/w PCI SCSI CONTROLLER

|     |     |      |      |      |
|-----|-----|------|------|------|
| 1Gb | 8Mb | 1295 | 1360 | 1435 |
| 2Gb | 8Mb | 1665 | 1730 | 1815 |

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#### Specifications for the 'Optimum Range'

- ▼ Intel CPU
- ▼ PCI bus for maximum performance
- ▼ Choice of CPU, hard disk & memory
- ▼ 1Mb PCI graphics accelerator card
- ▼ 15" SVGA N.I. MPRII monitor at 75Hz refresh or higher
- ▼ 8Mb RAM upgradeable to 128 Mb
- ▼ 256K external cache expandable to 512K
- ▼ 1.44Mb 3.5" floppy disk drive
- ▼ Integrated Fast I/O and Fast IDE
- ▼ 2 serial & 1 parallel port
- ▼ 102 key enhanced keyboard
- ▼ Microsoft ergonomic mouse and drivers
- ▼ MS DOS® 6.2 & Windows™ for Workgroups installed

## CRUSADER VL range

### The Budget solution

| HDD | MEMORY | 486SX2<br>50MHz | 486DX2<br>66MHz | 486DX4<br>100MHz |
|-----|--------|-----------------|-----------------|------------------|
| 420 | 4Mb    | 740             | 815             | 890              |
| 540 | 4Mb    | 780             | 855             | 930              |
| 700 | 4Mb    | 790             | 865             | 940              |

Other Configurations can be Tailored for you!

#### Specifications for the 'Crusader Range'

- ▼ Intel CPU
- ▼ Choice of CPU, hard disk & memory
- ▼ 4Mb RAM upgradeable to 64Mb
- ▼ 14" Super VGA N.I. MPRII monitor
- ▼ ISA and VL local bus
- ▼ Integrated Fast I/O and Fast IDE
- ▼ 1Mb VL graphics accelerator
- ▼ 128K cache
- ▼ 1.44Mb 3.5" floppy disk drive
- ▼ 2 button serial mouse and drivers
- ▼ 2 serial & 1 parallel port
- ▼ 102 key enhanced keyboard
- ▼ MS DOS® 6.2 & Windows™ for Workgroups installed

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|-----|--------|------------------|------------------|------------------|-------------------|
| 420 | 8Mb    | 1125             | 1150             | 1375             | 1540              |
| 540 | 8Mb    | 1165             | 1190             | 1415             | 1580              |
| 700 | 8Mb    | 1175             | 1200             | 1425             | 1590              |
| 1Gb | 8Mb    | 1290             | 1310             | 1540             | 1705              |

SCSI OPTIONS c/w PCI SCSI CONTROLLER

|     |     |      |      |      |      |
|-----|-----|------|------|------|------|
| 1Gb | 8Mb | 1435 | 1460 | 1685 | 1850 |
| 2Gb | 8Mb | 1805 | 1830 | 2055 | 2220 |

Other Configurations can be Tailored for you!

#### Specifications for the 'Power Range'

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- ▼ Choice of CPU, hard disk and memory
- ▼ ISA and PCI bus
- ▼ 14" SVGA Energy Star NI monitor
- ▼ 1Mb PCI Graphics accelerator card
- ▼ Integrated Fast I/O and Fast IDE
- ▼ 8Mb RAM upgradeable to 128Mb
- ▼ 256K external cache expandable to 512K
- ▼ 1.44Mb 3.5" floppy disk drive
- ▼ Microsoft ergonomic mouse and drivers
- ▼ 2 serial & 1 parallel port
- ▼ 102 key enhanced keyboard
- ▼ MS DOS® 6.2 & Windows™ for Workgroups installed

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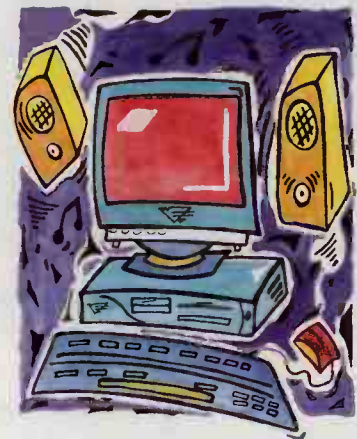
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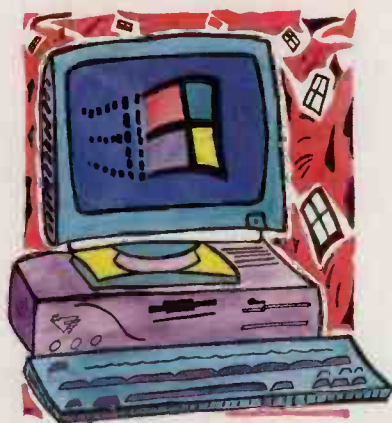
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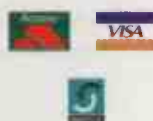


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## MOBILE DATA

● Cellnet has a comprehensive bundle of online services including IBM's Tell Me, which it sells with a Nokia 2110 GSM phone and data adaptor



If you could connect your mobile phone to your computer, you could be carrying the Internet in your pocket. Simon Rockman catches up with the latest developments in mobile data.

# Upwardly mobile

Some things aren't as simple as they seem. If you can talk into a mobile phone, it should be easy to connect a computer to a modem and that modem to a mobile phone line. Cruising the information superhighway while stuck in a traffic jam on the A406 ought to be no more difficult than logging into Demon from your spare room. But it's not that simple. For a start, there are three distinctly different types of mobile

phone: analogue, GSM and PCN. From the computer's point of view GSM and PCN are pretty much the same, but the difference between analogue and digital is more or less the same as that between ordinary phone lines and ISDN.

The vast majority of the 3.5 million phones in the UK are connected to the Cellnet and Vodafone analogue systems. These phones are cheap to manufacture and heavily subsidised by the suppliers

who make their money on the rental and usage, but there's no standard interface to connect analogue mobile phones to a computer. As a result, there are a number of proprietary solutions which rely upon you having the right computer, phone and modem (see page 446).

Analogue mobile phones are not really up to handling data, and if you think about what's going on this isn't surprising. A mobile phone is an analogue radio

DON'T CALL US, WE'LL CALL YOU



transmitter running at two frequencies between 890MHz and 950MHz. It is constantly varying the power output between 150mW and 650mW to enhance the battery life, and looking for a better frequency on which to operate, switching almost but not quite seamlessly if you move into an area where an adjacent cell has better coverage. Cells range from 500m to 30km apart, and radio is susceptible to strange blips and noises unlike those of a conventional phone system.

### Essential error-correction

An error-correcting modem is essential. For a while, a protocol known as CDLC was preferred since it was optimised for the kinds of noises which occur on an analogue cellular network; but as the general standards of error correction improved, NMP 10 became a more sensible option. With any kind of error correction there is always a trade-off between a speed where the equipment spends too much time correcting errors and one where the transmission is slow enough that there aren't too many. On a good day, sitting close but not too close to a cell which isn't too busy and not moving, an analogue system might provide a reliable 4800bps link. This is assuming you have one of the better integrated setups like the Compaq/Motorola system and are using a car kit to boost the radio signal to 4W. In practice you are more likely to get a poor 2400bps or 1200bps, especially if you are moving — which, after all, is what a mobile phone is all about.

Ultimately, if you have a mobile phone and a computer it is unlikely you will be able to connect the two reliably, so when a specification was drawn up for a pan-European digital mobile phone standard, there were plans for data from day one.

### The GSM European standard

The European standard is known as GSM, originally for Groupe Special Mobilé, but in a bout of francophobia this was changed to Global System for Mobile communications: a poor acronym, not only because it doesn't fit very well, but it isn't true. GSM is very much a European standard. It's available in 40 countries of which a little over half are European and most of the rest are Middle Eastern. There are no plans for GSM systems in Japan, and America is at least five years behind the UK mobile phone market. It's unlikely they will adopt a European system and they will probably end up with a combination of incompatible networks. But then, if the Americans can have a

"World Series" which only pertains to the New World, we can have a "Global" system which only works in Europe.

There are plans for international satellite-based systems, the main one being Motorola's Iridium; others are called Odyssey, Globalstar and Inmarsat-P. All these systems should provide full international mobile comms but there's a lot of space research to be done first, as they will require a couple of hundred satellite launches. The most ambitious telecommunications project is Teledesic, a system which has 840 satellites in very low orbit. The idea is that if a phone is within range of a number of satellites, it can transmit to all of them and so be less powerful. One of the major backers behind Teledesic is Bill Gates, but this is a personal project and does not benefit from Microsoft's money.

Teledesic is not a mobile system. The satellites move but the callers stay still. Despite the lack of a direct link between Teledesic and Microsoft, it would provide an ideal way for anyone, anywhere in the world to log into something like the Microsoft Network, which might be a realistic proposition by the time any of these systems are running — the other side of the year 2000. For the moment, GSM is the only game in town.

A GSM phone is ideal for sending data. The phone takes the human voice, digitises and compresses it using a 35mips Compression DECompression chip (CODEC). This data stream is then transmitted in packets to the cellular base station. The compression allows the packets to transmit at over eight

times the speed at which you speak into the phone. If the call is made to another mobile phone on the same network, the call stays as a stream of data which is transmitted to the receiving mobile where another CODEC takes the packets and decompresses them back into speech. A cheap mobile phone has more processing power than a top-flight Pentium desktop. If the call is to a phone on another network, whether analogue or digital, a CODEC in the exchange converts the packets into conventional speech.

The system of using packets makes efficient use of the radio spectrum. Eight channels allow seven calls and one control channel to be fitted into a single frequency. The cell base station tells each phone when to transmit its packet, allocating time slots to each of the callers. This system is called Time Division Multiple Access (TDMA). (Telephony has more unfathomable acronyms than computing and the two combined result in something like a bad Scrabble hand.)

Mobile data systems for GSM phones bypass the CODEC and transfer the data



● *Mobile data for the Apple Newton is finally on its way. It provides a complete solution which is easy to use — if you have three hands*



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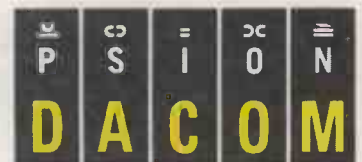
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as data. This is similar to an ISDN Terminal Adaptor, and as with a TA, a mobile data adaptor is not a modem.

One company has stolen a massive march on the rest of the mobile phone market and will be the only manufacturer to have a data adaptor for most of 1995. Nokia has developed a PCMCIA card for the excellent 2110 phone to provide a relatively simple link to the airwaves.

The throughput on a GSM data adaptor is a reliable 9,600bps, which makes for practical communications on the move. The data service is run separately from voice — you effectively have a different line on the same phone. There are three data classes: Data, Fax and SMS.

If you use a data adaptor in place of a modem, the device responds to standard Hayes AT commands. Sending an ATD command string and the number produces the number on the screen of the phone; then, when a connection is established, the display reads "data call" and the link is effectively the same as using a modem. When using the data adaptor as a faxmodem, the display reads "fax call". In our tests this has proved to work well with standard faxmodem software.

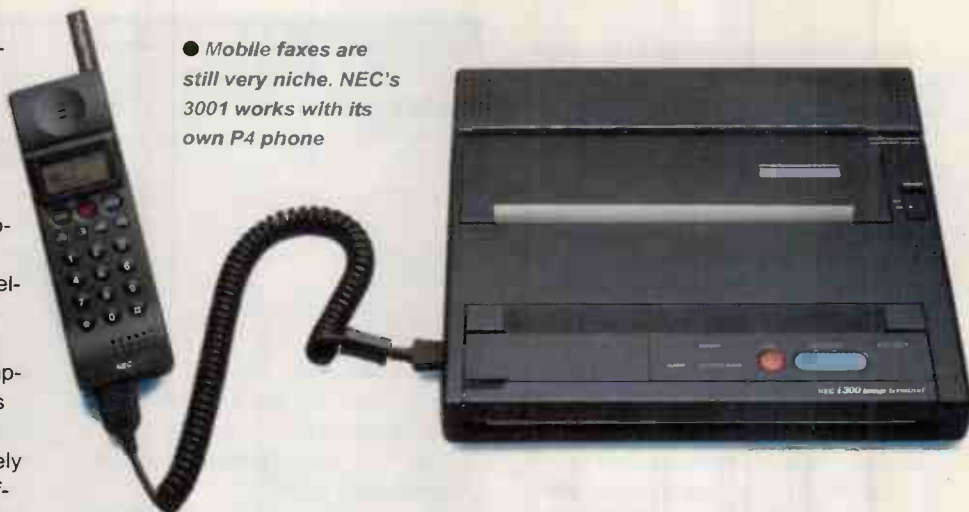
### Short Message Service

The SMS, or Short Message Service, option is more complicated. The GSM specification allows for a second data channel which is interspersed with the standard voice channel, and allows you to receive data while making a voice call. This takes the form of 160-character messages which can be sent from another phone by typing them in using the letters on the keypad. It's a laborious way to enter a message but convenient for the person who receives it: ideal if you are in the supermarket and someone at home wants to let you know you are out of washing-up liquid.

The phone stores the SMS messages and has some special features — you can sometimes dial a number contained in a message, for instance. The system is more reliable than a pager since it can make sure the message gets through. If a pager is out of range, it cannot receive a message and the message will not be re-sent. SMS waits until the phone is in range before sending the message.

The data card allows you to compose SMS messages on a computer and squirt them into the ether through the phone. Messages in the phone's memory can be read into the computer, making a good

● *Mobile faxes are still very niche. NEC's 3001 works with its own P4 phone*



secondary system for low-cost wireless two-way email. There are some large companies which offer services that just do this; with a GSM phone it is just an added bonus. With the right machine and software you could have a GSM phone linked to an Internet connection and send messages to another phone as they came in. This would of course be very expensive but it would give you an Internet connection in your pocket. SMS messages are limited to 160 characters but the next GSM specification will have a scheme which allows one message to be linked to the next. A simple terminal program in the data card handles SMS and provides an API for programmers who want to build systems based on this.

### Cost considerations

The Nokia card has opened up a host of possibilities for mobile computer users,

but as a device which just converts one kind of digital signal to another it is amazingly expensive. The RRP is £550 and the street price not much lower because the dealer margins are tiny. The phone is much cheaper because it is subsidised by the network.

The real cost in running a mobile phone is the monthly bill. A Cellnet PrimeTime Plus account, the type you will need if you want to use a phone for data, will cost £32.90 a month for the line, 29p per minute peak and 12p per minute off-peak. With a few extras such as insurance (a must — 15,000 phones are stolen every month) you should expect a digital mobile phone to cost £700 a year to run. This is quite close to the figure Vodafone quotes for business users and the Vodafone EuroWorld tariffs are only a shade less.

These high running costs provide a

### Bundles Based On Nokia

A number of companies have produced bundles based upon the Nokia 2110 phone, a computer and airtime. Apple has two systems, one for PowerBooks and one for the Newton. The new Newton 120 has 2Mb RAM but still cannot receive faxes, and is being sold with a bundle of the Nokia phone, data card and custom software. A more important enhancement to the Newton 120 is improved battery life which is necessary to power the data adaptor. There is no way to get phone numbers stored in the Newton into the memories of the phone. The airtime connection is provided by the BT Mobile service provider through Cellnet.

The PowerBook system offers links to Apple eWorld and provides full fax facilities, but the combination of cables, software and chargers is more than a little awkward. Even the Newton system is unwieldy unless you use a custom-made

case to hold both the phone and the PDA.

Odyssey Mobile Communications is a well established mobile phone dealer which is branching out into providing a mobile office system with a Canon BN-22 notebook. This 486DX/33 machine is a little underpowered by modern standards but is special in that it has a built-in printer, making the whole system ideal as a mobile fax. You can leave it plugged in in a hotel room, in the certain knowledge that if you are sent a fax while you are out it will be waiting for you on your return. There's no fax scanning, but it's the most complete system available.

ICL owns Nokia Data and also makes computers in the factories it bought in Finland, but there the link with the phone and PC company ends. The companies have been working together to provide an integrated solution, which suffers from the same cable and charger problem as the Apple and Canon systems.



huge incentive for the networks to get you connected to their system, so dealers are paid bonuses, typically around £300 for every connection. These bonuses are used to subsidise the phone, so the Nokia 2110, which should have a sensible street price of £500, is available for £200 — less than it costs to make and sell. This crazy system is exacerbated by the networks being banned from selling direct to end-users. This has now ended, but originally the government insisted that a middle tier, known as Service Providers, was used. Companies like Talkland, People's Phone and Martin Dawes, which handle the accounts and billing, are effectively wholesalers. They can also change the tariffs: they buy minutes from Cellnet or Vodafone and sell them to the customer. The result is a confusing combination of tariffs where you pay more to have the phone and less to use it, or vice versa. What Mobile and Cellphone magazine lists 186 different tariffs with calls ranging from £1.16 per minute to free.

### Which system?

The Cellnet system is currently the best bet for anyone who is serious about mobile data. It supports originated and terminated calls: in other words, a remote system can log in to a computer with a Cellnet phone and the user of the portable computer can make calls out to host systems. Vodafone currently supports only "Mobile Originated" calls. There are also tight limitations on the use of SMS, but these will ease up as the demand for mobile data increases and, more importantly, as the networks wise up to the advantages. Telecommunications companies are often distressingly ignorant of the possibilities which computers open up.

The great advantage of GSM, its ability to work throughout Europe, does not extend to data. The extra virtual lines and charging systems mean that a fair bit of work is necessary for data to be implemented, and so far only the UK, Germany, and the country with the highest percentage of mobile phone users — Finland — offer data. Data between countries sometimes works but it's very early days yet.

The lack of a foreign connection makes the domestic digital networks seem more attractive. Orange and Mercury use a similar technology to GSM which in theory has all the same data provisions. The major differences are in the radio side. A GSM phone works at

## Analogue Connection Solutions

If you have an Ericsson EH97 or EH237 phone you can connect it to a Texas Instruments notebook. A Compaq Lite with the expensive SpeedPac modem will control a Motorola MicroTac II or a Nokia 101. NEC can provide a system which allows you to connect an NEC notebook to an NEC phone and Panasonic has a similar package, but ultimately it's all a bit of a mess. None of the phones have a standard interface or protocol. They don't have a dial tone or a socket into which you can plug a modem, and even if they did, there's no equivalent of the Hayes AT command set to tell the phone which number to dial.

A couple of more general solutions are available from Motorola and Nokia. Motorola has a car kit with a phone socket. This produces a dial tone and in theory allows any modem to be attached to a line in a car as though it was in a house, but it only works

with some Motorola phones. The Nokia solution is better. It uses a PCMCIA card and interfaces to the 121 phone. An API allows full control of the phone. With the right software you could convert your Lotus Organizer address book into 100 numbers and squirt them straight into the phone. The card gives access to various diagnostic modes in the phone but there is no commercially available software to drive any of these features.

If you are desperate, there's the old-fashioned solution of an acoustic coupler. How well this works will depend on the physical design of the phone. If it's one of the newer, sub-50g units it probably won't work very well. The expert on this is Teleadapt, which specialises in connecting computers and phones to lines. Acoustic couplers just don't work very well, and that's par for the course.

around 900MHz, and has a power output of 2W for a hand portable and up to 20W for a car kit. An Orange or Mercury phone is just 1W, runs at around 1,800MHz and has a reduced coverage area.

To anyone living in London, Birmingham or the surrounding areas, a Mercury phone seems attractive. The personal user tariff is just £12.50 a month and gives free local calls during the evenings and at weekends. This has led to severe overcrowding in some areas at 7pm, and it can be difficult to get a line, but for the data user it seems ideal. With an Internet line to Demon costing only £10 a month, and free calls, it would be better to pay £270 a year for an off-peak Internet connection than over £5,000 for a leased line. But things don't work like that: there is no data service available on Mercury and there isn't likely to be one for at least a year. When data is available, it will be classed as a business service and charged for by the minute.

You can't even use an acoustic coupler with a digital mobile phone. The standard CODEC is optimised for the German male voice, which can't even cope with tone dialling. When you press the 5 key on a digital phone, the noise it makes is for your benefit. The tone doesn't travel down the line: a digital pulse to the exchange causes it to make the tone for the phone. There have been reports of people getting acoustic couplers to work, but it is outside the spec and the throughput must be dreadful.

A more sensible budget system is Orange: the newest network is in many ways the most advanced. It has

demonstrated data as a system. The Nokia Orange phone is technically similar to the Nokia 2110 and at around £200 costs the same, but for voice calls costs about half as much to run. No pricing for data has yet been announced but it's likely to be competitive. It uses exactly the same Nokia data card (one card will work with both types of phone) but as the service isn't likely to debut until the second half of the year it should be cheaper by then. Orange has the best SMS system, and will have send and receive for fax and data originate and terminate. Lotus has already announced a tie-up with Orange to make sure that Notes and cc:Mail users will be able to use email through their Orange phones. **PCW**

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Simon Rockman is associate editor of PCW and editor of What Mobile and Cellphone magazine.





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# Sticking to the script

**Stephen Rodda turns his attention to the more practical aspects of email, fax management and ftp. In the first of a series of articles, he works with the Procomm Plus scripting language to explore Internet connection.**

In this series of three articles I'll be exploring the scripting language of Procomm Plus for Windows, starting with Internet connection, mail retrieval and an ftp session. In parts two and three I'll be dealing with connecting to CIX and reading mail and unread comments in all topics, and uploading and downloading a file; culminating in a simple fax management routine.

We chose Procomm Plus for Windows as the program on which we'll be concentrating since it's a standard Windows type of program. It has a Visual Basic-style programming language so that we won't be introducing you to an entirely new programming language; just to an extended, communications-based superset of it.

Since we are using our own specific Internet connection and most connections

differ in their user interfaces, it will probably be necessary to log on to your own service manually, creating a log at first in order to have a visual recording of what the remote service requires of you. You might then need to tweak the scripts which we'll be discussing here.

Of course, we can always start with recording a script. Why write a script laboriously when you can record one? Fig 1 shows the script we recorded when logging on to the Internet provider (in our case, NLnet), although this could be Demon, Cityscape or any one of a host of UK providers. But remember that if you are using SL/IP or PPP, you will have to remember to have that protocol loaded first, since this is a modem-based networking system rather than a simple modem connection.

Note that here, the script has recorded the transactions faithfully, even to the last digits of the telephone number "65" which we typed wrong and had to correct with the two backspace characters (^H^H), followed by the correct last digit "5" and the carriage return (^M). We have, of course, removed our password from this listing. Notice too the garbage which was also recorded faithfully in the middle of the script (including the VT102 cursor positioning commands). This we can well do without. The edited script, therefore, will be more like that in Fig 2.

Note that although we have shortened the script considerably, it is no longer automatic. Although the first script is automatic, it assumes that there is mail in the inbox and also that there will be just one message in it. What we need is a routine which will find out *whether* there is unread mail and act accordingly. Rather than running the Internet menu system, this will have to open the user's mail box (located in the user's home directory of the Internet server) and download the message(s) if they exist.

Such a script would have to look out for a message from the mailer daemon which runs on the Unix box to which we are connected, telling us that there *is* unread mail, and this message might not necessarily be at a prompt. To do this, we will have to scan the screen for the mail



**Fig 1 Recorded script from Internet provider**

```

proc main
  transmit "ATDT ^66854465^H^H5^M"
  waitfor "Please login: "
  transmit "srodda^M"
  waitfor "Password:"
  transmit "mypassword^M"
  waitfor "TERM = (vt102) "
  transmit "vt102^M"
  waitfor "$ "
  transmit "is_menu^M"
  waitfor "Choice (I, M, N, G, W, T, S, U, D, A, B, P, R, C, ?, .) "
  transmit "m^M"
  waitfor "[Folder `INBOX` opened with 1 message]^[m^[1;"
  transmit "m^M"
  waitfor "^[K^[1;1H"
  transmit "m^M"
  waitfor "^[m NextMsg  ^[[7mSpc^[m NextPage  ^[[7mU^[m Undelete
                                ^[[7mF^[m Forward^[[22;1"
  transmit "m^M"
  waitfor "^[m NextMsg  ^[[7mSpc^[m NextPage  ^[[7mU^[m Undelete
                                ^[[7mF^[m Forward^[[22;1"
  transmit "m^M"
  waitfor "[^GNo default command in Message View Screen]^[m^[22;1H"
  transmit "m"
  waitfor "^[K^[1;1H"
  transmit "q"
  waitfor "^[22;33H"
  transmit "y"
  waitfor "Press <RETURN> to continue... "
  transmit "m^M"
  waitfor "Choice (I, M, N, G, W, T, S, U, D, A, B, P, R, C, ?, .) "
  transmit ".^M"
  waitfor "$ "
  transmit "exit^M"
endproc

```

notification. This comes onto the screen as "You have new mail" just before we are asked about the terminal type we want to use. It is this string we have to test for (and of course, if there's no new mail, we've also got to provide a convenient get-out). The waitfor command allows us to specify a time to wait which may either be specified as a number of seconds or as "FOREVER". Another

operator we'll use is "IF" which will, with the system variable "SUCCESS", return whether the system has new mail for us. We could, of course, use the

```

WHEN TARGET 0 " You have new
mail." call MAILhandler

```

type of command, but since we can predict when the mail notification will occur, it's probably easier to test for it just the once rather than to keep a process

scanning the input stream on the off-chance. The new script portion will look like Fig 3.

Note that using the mail command here, we are not taking advantage of the menued system; rather, running the Unix mail command (also a different mail environment).

### Refining the system

Now we have the bare bones of the system, let's make it a little more readable. It's one thing to write a script which functions, but another to make that script work in the way that the rest of the Windows interface does. We can write a dialogue box which will tell us that there is new mail, just like this:

First we start by opening the Dialogue Editor. This will create a dialogue box (you need not remember the names you use in the editor as the text is easily imported into the script editor). We include a screenshot of the dialogue editor (page 452), complete with the dialogue box which we have included in the script in Fig 4.

Let's consider what we are going to do with it. First we could automate the process of reading new mail to place the mail in a file on our local computer. There are various methods by which this may be achieved, from simply trapping the characters sent to the screen in a session and writing them to a file, to downloading the mail file and deleting it from the service provider's directory. Let's look at the easiest first, reading the screen. All we have to do for this is enable a log and read the mail, disabling the log when we have finished. We can use part of the code fragment above: see Fig 5.

Now, depending on the number of messages, all we do is send the continue reading character (in our case the return character) until all mail is read (Fig 6).

Once this has been done, all we have to do is pick up the file and add it to our list of email sent. Unfortunately, there are no programs specifically designed for tracking email on the Internet

**Fig 2 The edited script**

```

proc main
  transmit "ATDT ^6685445^M"
  waitfor "Please login: "
  transmit "srodda^M"
  waitfor "Password:"
  transmit "mypassword^M"
  waitfor "TERM = (vt102) "
  transmit "vt102^M"
  waitfor "$ "
  transmit "is_menu^M"
endproc

```

**Fig 3 The new script portion**

```

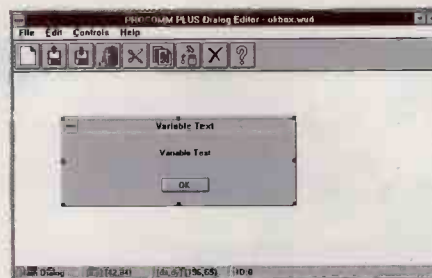
transmit "mypassword^M"
integer new_mail
new_mail = 0
waitfor " You have new mail." 10
  if success
    new_mail = 1
  endif
transmit "vt102^M"
waitfor "$ "
  if new_mail == 1 ;note that two equals signs are used here.
    transmit "Mail^M" ;tells the system to read the mail,
  endif ;using the mail command.

```



**Fig 4 Using the dialogue editor**

```
integer Event
string Caption
string Msgtext
proc main                                ;code fragment follows
Caption = "Mail Status"
Msgtext = "You have new mail"
dialogbox 0 42 84 196 65 82 Caption      ;this was created by the dialog
                                          ;editor
    pushbutton 1 81 41 40 14 "OK" ok      ;note that the text was chosen as a
                                          ;variable
    text 2 41 14 120 15 Msgtext center    ;to allow reuse of the dialog box.
enddialog
while 1
    dlgevent 0 Event
    switch Event
        case 0                            ;keeps cycling through testing the
            endcase                        ;button until pressed
    endswitch
endwhile
dlgdestroy 0 CANCEL
endproc
```



**Top** Dialogue Editor showing the "OK" box defined in the text  
**Bottom** Our dialogue box in use

**Fig 5 Enabling and disabling a log**

```
transmit "mail^M"
set capture query off                ;Stops program asking for a filename
set capture file filename current    ;makes program use the current filename
capture on                           ;starts the capture
```

**Fig 7 Sending a file**

```
proc main
    transmit "send mbox^M"           ; Get the host to send the file
    waitfor "Begin local download"    ; Wait until the remote system is ready
    getfile ZMODEM                    ; Switch to receive mode, using ZMODEM
    while $XFERSTATUS                 ; Read the system variable $XFERSTATUS
        yield                         ; and pause processing whilst operating.
    endwhile
endproc
```

as such, although there are offline readers which may allow a mail session to be prepared and saved offline. Using a word processor would probably be a good idea, simply for storage of the files and being able to track your email.

The other method we can use is to get the system to send the mail to us as a file. On our system, the file we need is called mbox and is located in the /home/<user> directory. It's a fairly easy matter to request the remote system to send the file to us; all we have to do is to send the appropriate command to the system and receive the file as sent.

**Fig 6 No unread mail**

```
while new_mail = 1
    transmit "^M"
    waitfor "There is no unread mail." 10
    if success
        new_mail = 0
    endif
endwhile
capture off
transmit "xit" ;the command to exit the mailer
program
```

The preparation for this will involve a little more work, which is where any downloading procedure becomes slightly more complex. First we have to find out what protocols the remote system uses and to which our default is set. In our case, the remote system is set to use

Zmodem, certainly one of the more robust and faster protocols. One of the advantages of Zmodem is that it can be configured to autostart once the program detects a Zmodem data stream, so that we have less preparatory programming to do. All we need to do to make the transfer work is issue the following commands:

```
set zmodem errdetect CRC32
set zmodem receiver crashrecover
                                timestamp
set zmodem receiver overwrite newer
```

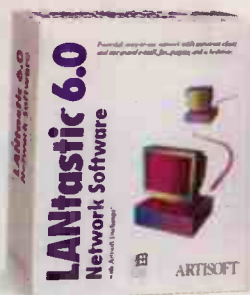
These will set Procomm Plus for Windows to receive Zmodem packets. Now, in order to start the transfer, all we have to do is get the remote system to send a file, either by ftp to our local directory or direct from an area accessible to us, and wait for the expected file. Of course, the script fragment we have used in Fig 7 will not check for errors, but this would be simple to implement using the commands discussed above and is left as an exercise for the reader.

Next month we'll be concentrating on a simple script for CIX (Compulink Information eXchange), allowing transfer of all unread messages in all topics to which we are joined, and all unread mail messages to a local file for processing by an offline reader such as Ameol or WigWam; followed by a routine to upload a file to our mail directory and send it as binary mail to another user; downloading a file from our mail directory which was sent to us by another user, and downloading a utility file to our local hard disk.

### PCW Contacts

**Stephen Rodda** is an independent computer consultant specialising in DTP and networking. He may be contacted as [the\\_bear@cix.compulink.co.uk](mailto:the_bear@cix.compulink.co.uk)





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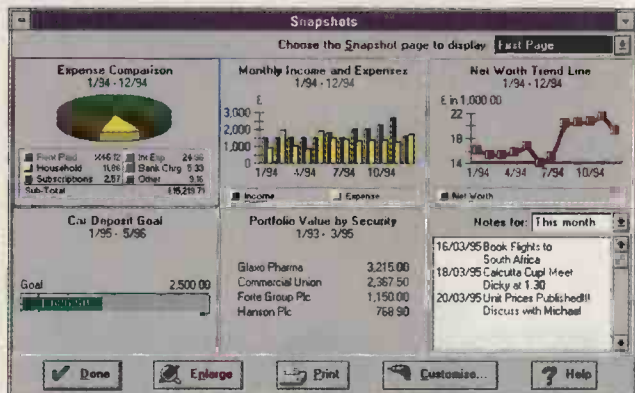
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## Spreadsheets Contents

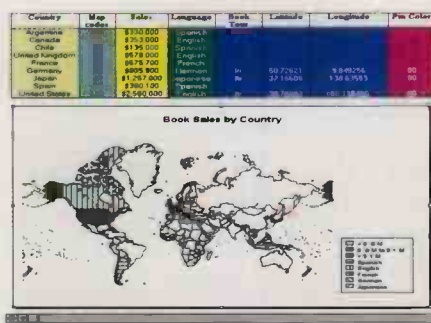
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# The hard cell

**It's not lack of functionality that's killing off DOS spreadsheets, it's the spread of GUIs. But is it enough to put on a brave interface or is a Windows spreadsheet only as good as its encompassing suite? A year after he last did his sums, Mark Whitehorn continues his search for the perfect cell mate.**

**A** year ago we said the development of DOS spreadsheets was likely to continue only for the next couple of years. We were too generous. All the DOS spreadsheets in this review are the same versions as in June 1994, and there were no "imminent betas" available from the manufacturers. We strongly suspect that development for DOS, apart from maintenance releases, is finished.

On the Windows front there has been considerably more movement. Borland has sold Quattro Pro (both DOS and Windows versions) to Novell, which is trying to make serious inroads into the applications market. To this end it has incorporated Quattro Pro into its PerfectOffice suite which now competes with the suites of Microsoft and Lotus. It is clear from the very healthy sales of such suites that future domination of the spreadsheet market is likely to depend less on outright



quality and more on the strength of the encompassing suite. But products haven't just been moving: some have been disappearing altogether.

In 1993 Improv was released for the Windows platform, bringing with it the first real capabilities for handling multi-dimensional data on a PC. Lotus was also shipping 1-2-3 for Windows at the time, but it justified the existence of two Windows

products by claiming that the integration of true multi-dimensionality into a normal spreadsheet was impossible. Lotus may have been correct in absolute terms, but within a year, new versions of the opposition spreadsheets had appeared with multi-dimensional capabilities. The purity of such bolt-ons may be open to question, but not their usability. Lotus has recently announced that development of Improv has ceased, so it requires little imagination to guess what will be the major new feature in 1-2-3 Release 6 when it appears.

We have gathered together, for your edification, the best spreadsheets in the world and laid bare their secrets. Despite a high level of common functionality, they still differ markedly in many areas that matter to the discerning user. If you need to choose a spreadsheet for home or office use, read on.



# Excel 5.0 for Windows

One of the first things a new user will see in Excel is the Tip Wizard, a friendly individual who presents you with a Tip of the Day whenever the spreadsheet is loaded. The Tip Wizard has a collection of bits of advice, tips and tricks for getting the best out of Excel. As well as a daily slice of advice, it watches your actions as you use the program and offers specific suggestions about ways in which you can improve efficiency when undertaking particular tasks.

The tabs on the bottom edges of worksheets have taken much of the sting out of building a workbook of multiple sheets. The analogy with the tabs for finding the Bs or Ks in an address book is so good that it is readily accepted even by novice users, who will soon be moving happily between worksheets.

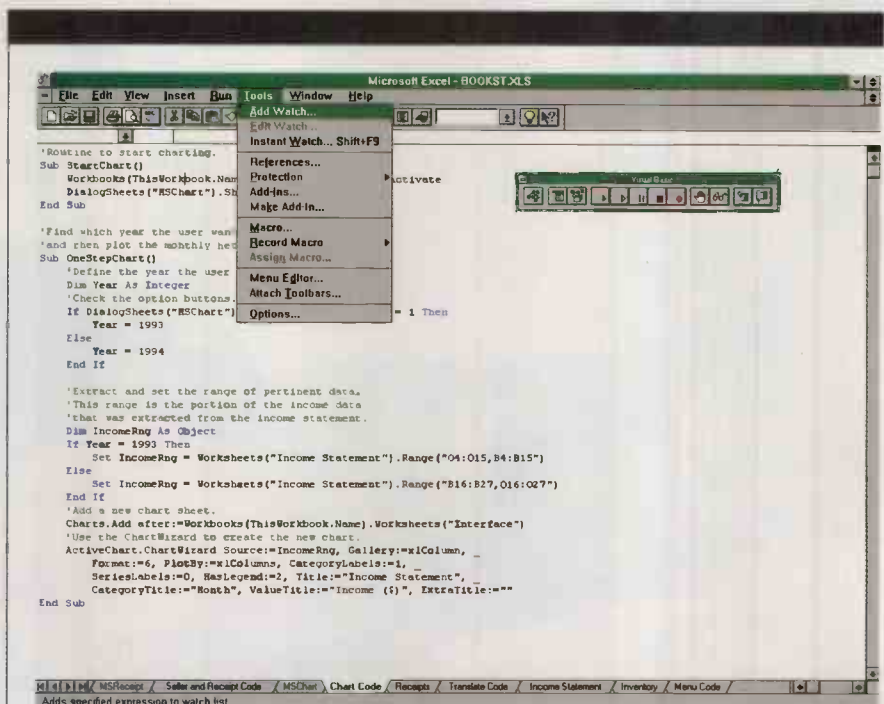
Formatting buttons have been improved for this release of Excel. With the toolbar open for formatting data, the two buttons for controlling the background and text colours are divided into two sections. The right side of the button opens a palette for making colour selections, and the left side "remembers" the choice you made and keeps it on hand in case you want it again (which experience suggests is often the case). You can separate the palette from the button and keep it floating on the worksheet — an excellent idea if you're doing a lot of work with colours.

If you've spent a lot of time formatting a cell, changing colours, text size, font and adding borders, you'll be pleased to find the Paste Format button. By clicking on your finished cell, on the Paste Format button and then on another cell or block of cells you wish formatted in the same way, all the formatting changes will be applied automatically. There is also a spell checker for ensuring any text is free from typos.

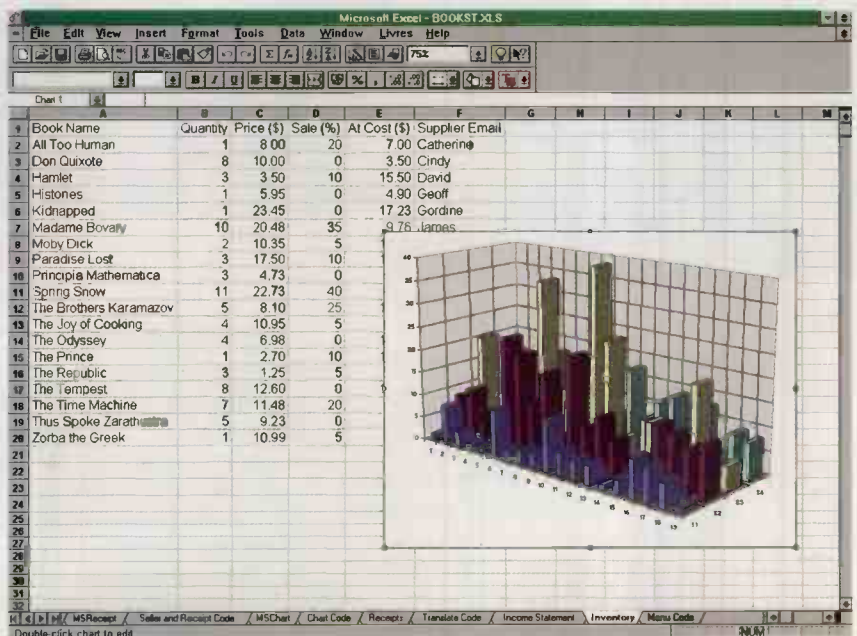
The tools offered for statistical plotting, graph drawing and annotating are comprehensive and sophisticated. There are two ways of creating graphs. The first, for the instant gratificationist, allows you to highlight a block of data and let Excel produce a graph immediately which you are free to edit. The second is to invoke a Wizard's help and by making choices from the options you're shown (types of graph, 2D or 3D appearance etc) a graph is built up to your own specifications. Of course, you still have the option to edit it

further if things aren't quite perfect. The Drag and Plot feature is an excellent addition (and unique to Excel), letting

you add data to an existing graph by highlighting a block of new figures, dragging it onto the graph and releasing it.



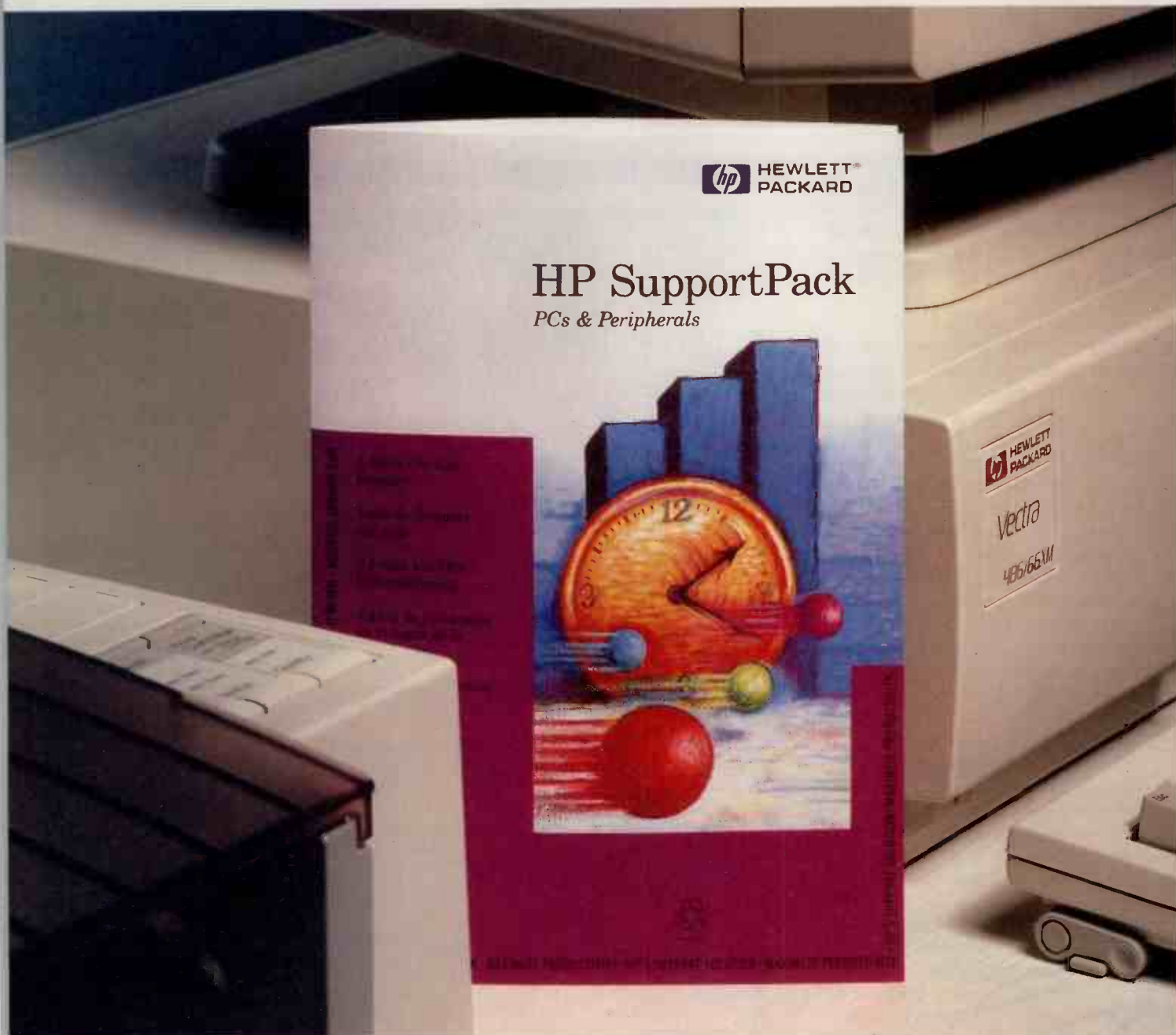
*Excel uses Visual basic as its control language. It is considerably more verbose than the cryptic macro languages of DOS, but much more readable and the control structures are much better*



*Excel has an excellent set of charting tools. Difficult to show in a single screenshot, but delightful to use in practice, is the ability to pick up and rotate a graph to alter the viewer's perspective. This isn't just a toy — in three-dimensional graphs important data can be hidden from certain view points*



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Graphical abilities now include Trend Lines, a feature which will plot a "line of best fit" through a scattering of points on an X-Y graph.

It is also capable of plotting logarithmic, exponential and polynomial lines, and users who need to use these statistical techniques for extracting information from their data should give Excel their earnest consideration.

Annotating graphs, however they're created, can give them a more attractive appearance and make the messages they hold more readily visible. Excel lets you play with colours, fonts and their sizes, and add clip art; and it provides drawing tools so you can draw and incorporate your own sketches or logos. To get the best angle on your graph, Excel's chart rotation tool still leads the field. When you pick up one corner of the graph using this tool, it appears as a wireframe diagram which you can drag around the screen until you find the best view of it. When satisfied, you let go of the chart and it is redrawn in its new alignment.

Excel's macro language is based on Visual Basic, in keeping with Microsoft's stated policy of using Basic-type languages for controlling all Windows-based software. It's a major change if you're well versed in the old Excel macro language, but as macro languages in general change from old-style cryptic syntax to the more verbose Basic style, many people will already have had some exposure to such languages. However, macros written for version 4.0 will run in 5.0 and can be edited and extended.

Wizards abound in Excel, and an excellent addition to the tribe is the Text Import Wizard for dealing with importing data from other applications. You specify the file type and delimiter, and the Wizard shows you a sample of the data as it will look when imported. If you like what you see, you choose to continue with importing; if not, you can try a different delimiter. This "suck it and see" approach to importing is a gift.

And whether you import data and add to it, or simply create it *in situ*, the automatic creation of data forms is a revolutionary addition. As soon as you have a set of column labels and the first record, choose Data, Form and a data form appears on screen. It's highly useful, but be aware that there's no error trapping of data entered this way.

Various data handling tools are on

hand to make life easier, and Excel can handle a block of data as if it were a table in the DBMS sense, although it calls such a block a "list". Sorting, filtering and querying are all possible, with sorting coming top of the list for ease of use. To sort a column of data, simply click in the column and click on the Sort Ascending or the Sort Descending button. That's it. For a more complex sort, choose Data, Sort from the menu with the cursor in the list and make selections from the dialogue box which appears.

Finding matching entries in a list is also done via the Data menu, choosing Filter, Autofilter. This works best with fewer than 250 records; it would seem that Excel is incapable of dealing with more than this number when filtering. More than 250 records can be filtered by choosing Custom from the list and entering the necessary criteria. Querying is rather like an extended form of filtering, though it's a little more tortuous in operation.

A Goal Seek command appears in the Tools menu for use in finding a specific value for a given cell by adjusting the value in one other cell. If, for example, you wanted to know how many bottles of *Châteauneuf du Pape* you had to sell to be able to buy that XJS, you could use goal seeking to this end. For more complex problems involving several cells with variable contents, Excel has a Solver, described as an optimisation and resources allocation tool. With the Solver you can set limits on the range of values permissible in any cell and find possible solutions to such vague questions as

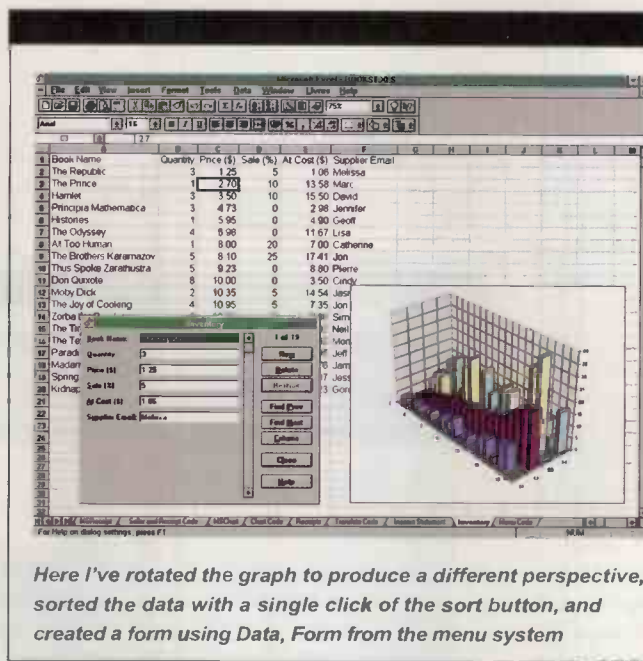
"how can we maximise profit?". It takes some forethought and planning, but it can be a powerful tool for planning and for pointing up less than obvious consequences of certain actions.

Multi-dimensional capabilities also appear in version 5.0 and while these are not as wholehearted as the Improv implementation, they do let you summarise your data by building Pivot tables. With several categories of data (such as geographical areas, wine producers, grape varieties and costs) you can inspect different views by moving the categories

around. The original data remains undisturbed. The Pivot table usually lives on a separate worksheet and you can use the feature whenever you wish to get a better, or different, overview of your data.

Excel is also available as part of the Microsoft Office suite, alongside (in the Pro version) Word, PowerPoint, Mail and Access. The integration between the elements of the suite is okay but not perfect, and this is an area where we expect to see improvement in future releases. Will Microsoft combine Excel and Access into a single package called Excess? The public has a right to know.

If Excel has a flaw, it's that it sometimes stresses the appearance of power, rather than power itself. For example, the ability to pick matching records from a list looks great but doesn't work well with more than 250 entries. Since the list is capable of holding more than 16,000 records, this is disappointing. But make no mistake, it's an excellent all-round spreadsheet.



### PCW Details

#### Excel 5.0 for Windows

**Contact** Microsoft 01734 270000.

Fax 01734 270002

**Price** £269

**Good Points** Features that are really useful, good integration with Access.

**Bad Points** Not enough emphasis on real power.

**Conclusion** A winner, with lots of excellent features and superb usability.





## Quattro Pro 6.0

Since we last looked at spreadsheets, Quattro Pro has moved house. Formerly it was stabled at Borland, now it resides in the Novell Suite. The interface has undergone some changes to bring it in line with the rest of the Novell PerfectOffice products and the version number has been incremented to 6.0.

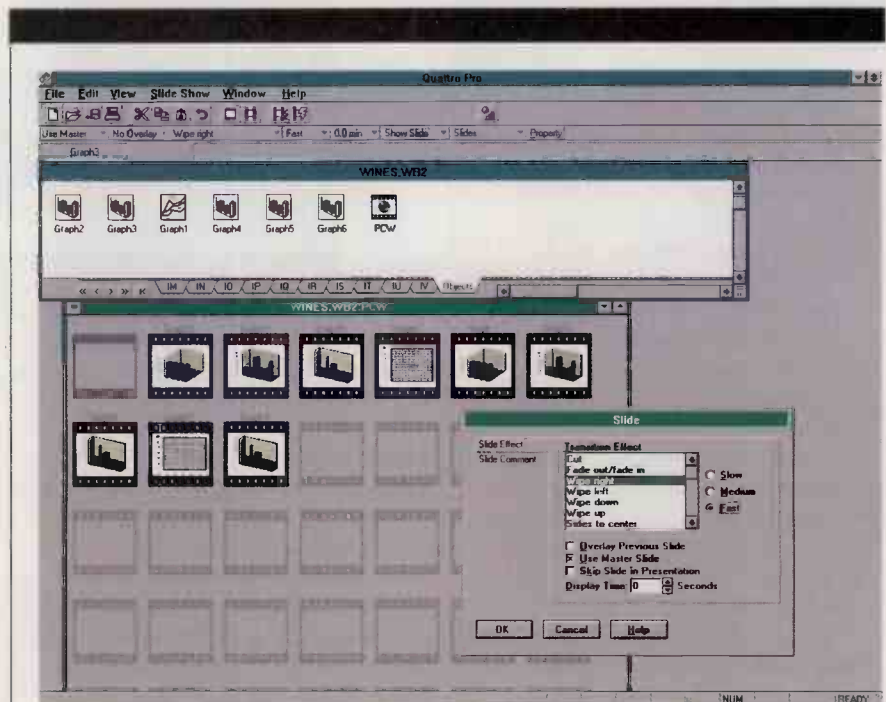
Quattro Pro is now supplied on eight floppies and CD-ROM. Both work fine, but clearly the CD-ROM version is preferable for speed and convenience. Even before the purchase by Novell, its installation was much more network-aware than other spreadsheets. This version is even better. If you are installing to a network drive it asks if you want to install for multiple users. Assuming that you say "Yes", the program group acquires two extra icons — Quattro ProW Network Administrator Setup and Quattro ProW Network User Setup — which can be used much as the names suggest.

Quattro Pro has always had a cornucopia of features; so many, in fact, that it has become like an integrated package on its own, even before its inclusion with PerfectOffice. You can take it as read that it behaves in the usual spreadsheet fashion, with numbers, formulae and labels being entered and manipulated in the usual way. When you open a new Quattro Pro "file", it is actually a "notebook" which consists of 256 worksheets. These are essentially a three-dimensional stack, each accessible via tabs at the bottom of the notebook. It's a neat idea, now to be found in most spreadsheets, but it appeared first in Quattro Pro. In fact, there is a 257th sheet, the Object Page where the charts that you create are stored (see above right).

Using the mouse is a delight in Quattro Pro. You can edit the contents of the cell in place (as well as on the edit line) simply by double-clicking the cell, a feature of which we heartily approve. Its only weakness is revealed if you try to edit dates. These can be entered as, say, 12/8/67 and, in common with most spreadsheets, are stored as a numerical value, in this case 24814. Editing a date transforms it from the readable version to the numerical representation, so in practice dates are easier to re-enter than edit. 1-2-3 handles this much more elegantly (you simply edit the date) while Excel doesn't allow in-cell editing — a much poorer solution.

In Quattro Pro, right-clicking a cell, a range of cells or indeed almost any object in the interface allows property

inspection. A menu of the object's properties appears and can be used either to inspect or to alter the properties.



*Quattro Pro has an excellent slideshow facility. Every graph you create in a notebook is stored on the Object Page. From there they can be placed in the slide show. Right-clicking a single slide allows you to edit its properties*

|    | A    | B  | C        | D      | E     | F     | G   | H         | I | J |
|----|------|----|----------|--------|-------|-------|-----|-----------|---|---|
| 71 | 1991 | Q2 | Duckhorn | Merlot |       | \$148 | 329 | \$48,892  |   |   |
| 72 | 1991 | Q3 | Duckhorn | Merlot |       | \$148 | 330 | \$48,840  |   |   |
| 73 | 1991 | Q4 | Duckhorn | Merlot |       | \$148 | 341 | \$50,468  |   |   |
| 74 | 1991 | Q1 | Duckhorn | Merlot |       | \$148 | 660 | \$97,680  |   |   |
| 75 | 1991 | Q3 | Beaulieu | Merlot | West  | \$160 | 350 | \$56,000  |   |   |
| 76 | 1991 | Q2 | Beaulieu | Merlot | West  | \$160 | 325 | \$52,000  |   |   |
| 77 | 1991 | Q1 | Beaulieu | Merlot | West  | \$160 | 320 | \$51,200  |   |   |
| 78 | 1991 | Q4 | Beaulieu | Merlot | East  | \$160 | 650 | \$104,000 |   |   |
| 79 | 1991 | Q3 | Beaulieu | Merlot | East  | \$160 | 625 | \$100,000 |   |   |
| 80 | 1991 | Q2 | Beaulieu | Merlot | East  | \$160 | 575 | \$92,000  |   |   |
| 81 | 1991 | Q1 | Beaulieu | Merlot | East  | \$160 | 550 | \$88,000  |   |   |
| 82 | 1991 | Q4 | Beaulieu | Merlot | South | \$160 | 280 | \$44,800  |   |   |
| 83 | 1991 | Q3 | Beaulieu | Merlot | South | \$160 | 230 | \$36,800  |   |   |
| 84 | 1991 | Q2 | Beaulieu | Merlot | South | \$160 | 275 | \$44,000  |   |   |
| 85 | 1991 | Q1 | Beaulieu | Merlot | South | \$160 | 270 | \$43,200  |   |   |
| 86 | 1991 | Q4 | Beaulieu | Merlot | North | \$160 | 200 | \$32,000  |   |   |
| 87 | 1991 | Q3 | Beaulieu | Merlot | North | \$160 | 195 | \$31,200  |   |   |
| 88 | 1991 | Q2 | Beaulieu | Merlot | North | \$160 | 190 | \$30,400  |   |   |
| 89 | 1991 | Q1 | Duckhorn | Merlot | East  | \$148 | 481 | \$71,188  |   |   |
| 90 | 1991 | Q3 | Duckhorn | Merlot | East  | \$148 | 485 | \$71,780  |   |   |
| 91 | 1991 | Q4 | Duckhorn | Merlot | East  | \$148 | 499 | \$73,852  |   |   |
| 92 | 1991 | Q1 | Duckhorn | Merlot | West  | \$148 | 275 | \$40,700  |   |   |
| 93 | 1991 | Q2 | Duckhorn | Merlot | West  | \$148 | 280 | \$41,440  |   |   |
| 94 | 1991 | Q3 | Duckhorn | Merlot | West  | \$148 | 285 | \$42,180  |   |   |
| 95 | 1991 | Q4 | Duckhorn | Merlot | West  | \$148 | 289 | \$42,772  |   |   |
| 96 | 1991 | Q1 | Duckhorn | Merlot | North | \$148 | 200 | \$29,600  |   |   |
| 97 | 1991 | Q2 | Duckhorn | Merlot | North | \$148 | 206 | \$30,488  |   |   |
| 98 | 1991 | Q3 | Duckhorn | Merlot | North | \$148 | 212 | \$31,376  |   |   |

*Quattro Pro has acquired a feature which resembles the active status bar in Lotus, except that it is at the top of the screen rather than at the bottom. It even offers the same type of formatting abilities*



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| QuickTax Tax Estimate for year ended 5 April 1995 |   |         |
|---|---|---------|
| Total income from all sources                     | £ | 25000   |
| Less Total Deductions                             | £ |         |
| Taxable Income                                    | £ | 25000   |
| Less Total Allowances                             | £ | 1000    |
| Amount chargeable to tax                          | £ | 24000   |
| Chargeable at:                                    |   |         |
| Low rate at 20% on                                | £ | 4800    |
| Basic rate at 25% on                              | £ | 19200   |
| Higher rate at 40% on                             | £ |         |
| Tax estimated for 1994/95                         | £ | 6120.00 |
| Less tax already deducted in the year             | £ |         |
| Less tax relief                                   | £ | 360.00  |
| Net tax due                                       | £ | 5760.00 |

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The User Interface Builder can be used by developers to construct interfaces for naïve users and/or specific tasks. If you use it to build a dialogue box, the default one appears with an OK and Cancel button; it's up to you to add the other parts. However, you also get a special toolbar which has a host of interface objects including spin boxes, check boxes, radio buttons, labels, fields, combo boxes etc. Many of these can have sub-types, so for example if you add a combo box you can choose to have it automatically display the available disk drives simply by making the appropriate selections. Once constructed, it really is embarrassingly easy to place a button on the worksheet and tie the appearance of the dialogue box to the action of pressing that button.

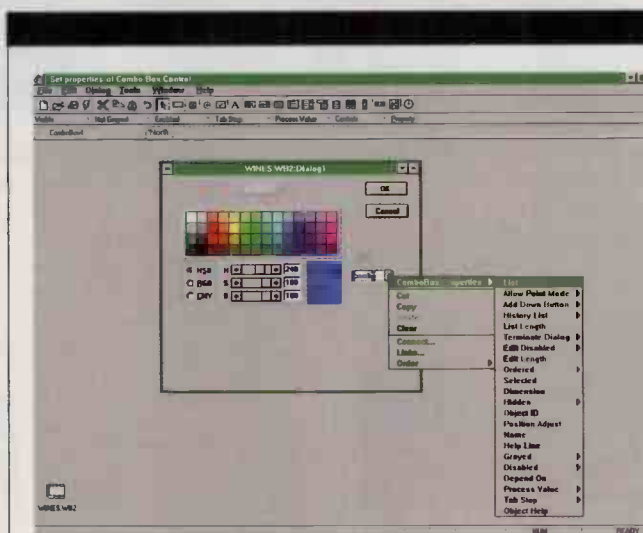
The interface objects, such as buttons, can also be tied to macros, but the macro language itself is disappointing, falling as it does somewhere between the cryptic Lotus 1-2-3 style of DOS and the verbose but readable Basic. (It is also overly keen on the use of curly brackets) e.g:

```
{SelectBlock A:G2..H14}
{GraphNew Graph1}
{Series.Data_Range 1,A:G2..G14,1}
{Series.Data_Range 2,A:H2..H14,1}
```

All spreadsheets now allow the production of graphs, but Quattro Pro has for several years led the way in presentation. In fact, its presentation ability is so powerful that it rivals that of many stand-alone presentation packages. Quattro Pro lets you create graphs from numerical data in the usual way.

You can then edit the graph altering all the usual suspects, even down to adding bitmaps as backgrounds to your charts. Every graph you create is automatically placed on the Objects page, the last worksheet in the current workbook. From there you can drop the graphs onto a "slideshow"-type presenter. You can drive the presentation manually or set the time delays between each slide. You can also choose from dozens of different transition effects. Since a slide doesn't *have* to contain a graph, and can consist of text and/or other images, Quattro Pro is a very effective presentation tool.

Three-dimensionality is handled with the tabbed worksheets described above. For multi-dimensional data Quattro Pro uses its Data Modelling Desktop which



*The User Interface Builder in Quattro Pro is a delight to use. Here I have added a (rather anaemic) clock, a colour palette and a combo box from the toolbar at the top of the screen*

allows you to summarise your data; see the lower screenshot on page 460. It is easy to move the categories around, so I could move the Years down to appear on the lefthand side of the table. Also included with Quattro Pro is the Database Desktop; the name is similar but the function is quite different. The Database Desktop allows you to link the data in one application to the corresponding data in another using DDE. Anyone who is aware of other products in PerfectOffice will not be surprised to see that the interface of this add-in is Paradoxian in the extreme. The Database Desktop allows you, say, to set up a link between a Paradox or dBase table and a Quattro Pro notebook. Adding a record to the table results in the same data appearing in the notebook.

In fact, the Data Modelling Desktop and Database Desktop are separate programs. Each has its own icon in the Quattro Pro Windows group, although both can be launched from Quattro Pro. The chart Annotator isn't a separate package, but it feels like one, so with these three radically different sections it's easy to see why Quattro Pro can feel like an integrated package rather than just a spreadsheet.

All this functionality could mean a steep learning curve and a slow package. Well, one out of two isn't bad. To address the steep learning curve Quattro Pro has Experts and Coaches. The experts are a series of dialogue boxes which ask you questions and perform tasks for you; essentially they're the equivalent of Microsoft's Wizards. The average user is likely to make continual use of these, to

speed up otherwise tedious processes. There are several new ones in version 6.0, including the Budget Expert which helps you with home or office accounts. The Coaches are there to explain how particular processes work, so once you have used one a couple of times you will hopefully understand it and be unlikely to call on it again. So in general, Quattro Pro combines high functionality with ease of use. Sadly, though, the speed issue is less well addressed.

This year we ran all the spreadsheets on a 386DX/33 with 8Mb as the low-end machine, and a 486DX4/100 with 16Mb. Given no swapfile on the latter, Quattro Pro was sometimes unable to run the Data Modelling Desktop. With a

12Mb swapfile all was well and the interface was acceptably fast. But this is an above-standard PC and on the lower spec machine Quattro Pro felt very slow, particularly if the Coaches were used. The box suggests that it can run in 4Mb but recommends 8; we would recommend 16.

Running one of the Experts revealed that Quattro Pro defaults to using its own international settings rather than the Windows ones. This is unfortunate for UK users since the default in Quattro Pro is a \$ sign for currency. Even if you have conscientiously used the control panel to set the £ sign, Quattro Pro thinks it knows better and works in US currency. It's not a great problem, since a right-click on the Quattro Pro window header allows the Windows International defaults to be selected so that the £ sign is then used. But why Quattro Pro should default to ignoring your global choices is beyond us.

Quattro Pro oozes functionality and has the hard bite of real power, but to really use that power requires some serious hardware.

### PCW Details

#### Quattro Pro 6.0 for Windows

**Contact** Novell 01344 724000.

Fax 01344 724001

**Price** £285

**Good Points** Feature-rich with good hooks into Paradox and dBase.

**Bad Points** Needs serious hardware to show it off to its best advantage.

**Conclusion** Go for it, if you have the hardware and memory.





# CA-SuperCalc for Windows 1.0

SuperCalc for Windows is the first Windows incarnation of the now elderly SuperCalc for DOS. Released over a year ago and still on version 1.0, it has all the problems associated with early Windows product releases.

The first and most noticeable of these is the many oddities of the interface: don't expect it to follow the usual Windows conventions because it won't. For instance, when you're selecting from a list of graph types you can't just double-click on the chosen type; you must highlight it and click on OK. This example alone would be a minor criticism but similar examples are to be found throughout the product.

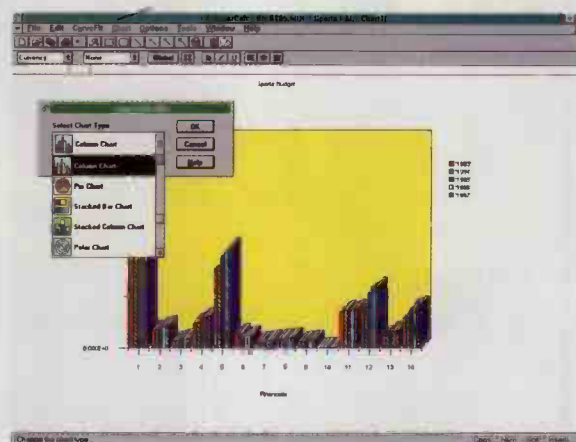
Users can edit font styles, sizes and colours on a worksheet, and such formatting can also be done in the cell. If you create a particularly finely formatted worksheet, you can create a Named Style and apply it to cells on other worksheets. A form of shortcut menus has been implemented, accessed by the right mouse button, for use when formatting; but this useful feature is not available when you're working on a graph, an occasion when you might wish to edit colours, fonts and the like.

A reasonable range of nine graph types is offered, and to change type you click on a button. This action does not, as you might expect, show you a representation of each type: it shows just one. To see more takes a click on a further button, whereupon you have to scroll around looking for the one you wish to use. It's this type of thoughtlessness in the user interface which really alienates the spreadsheeting public. Even the patient users of the DOS version could be forgiven for sighing heavily.

Proceeding further with creating a graph, you outline a block containing words and numbers to be used as labels and data respectively. SuperCalc can't cope with this, responding instead with a blank graph and an error message. Back to the drawing board, or to seek assistance which is only available from the Help system; there are no Wizards or Tutors or other imaginative assistants for the novice user.

|                    | 1994         | 1995         | 1996         | 1997         |
|--------------------|--------------|--------------|--------------|--------------|
| Sales              | \$10,000,000 | \$11,701,784 | \$12,111,347 | \$12,777,471 |
| Production         | \$700,000    | \$735,000    | \$856,529    | \$905,265    |
| Cost of Goods Sold | \$2,400,000  | \$2,520,000  | \$2,955,094  | \$3,117,549  |
| Operating Profit   | \$7,600,000  | \$7,980,000  | \$8,846,890  | \$9,659,922  |
| SG&A               | \$1,302,500  | \$1,368,000  | \$1,058,983  | \$1,154,146  |
| Distribution       | \$625,000    | \$650,000    | \$702,240    | \$706,793    |
| Utilities          | \$850,000    | \$890,000    | \$920,042    | \$952,244    |
| Rent & Equipment   | \$650,000    | \$680,000    | \$719,994    | \$745,090    |
| Interest           | \$75,000     | \$75,000     | \$76,309     | \$78,980     |
| Operating Expenses | \$3,503,000  | \$3,663,000  | \$3,475,488  | \$3,597,109  |
| Operating Income   | \$4,097,000  | \$4,317,000  | \$5,371,222  | \$5,964,972  |
| Tax                | \$1,229,100  | \$1,295,100  | \$1,611,888  | \$1,759,491  |
| Net Income         | \$2,867,900  | \$3,021,900  | \$3,759,334  | \$4,105,481  |

SuperCalc for Windows has the ability to handle multi-dimensional data



The chart types are limited in SuperCalc and the interface is less than intuitive

SuperCalc also has very strange ideas about dimensions. It offers two-dimensionality, as does every other spreadsheet, and multi-dimensionality as is becoming more common. What it doesn't provide is three-dimensionality, which is what most users will choose as an extension to using two dimensions, rather than the more mind-bending multi-dimensionality. Although the implementation is acceptable, with formulae written with English-like syntax which can be built up into phrases to define the multi-dimensional view, it doesn't make up for the lack of a third dimension.

But it's not all bad news for the DOS SuperCalc user who has chosen to upgrade; the macro language is another Basic-based one, called CA-BLE, which will import and translate DOS SuperCalc macros. A creditable list of functions is supplied (and you write for yourself any

others you need) and the range of tools is good. These include Goal Seek for finding how a specific outcome can be achieved, and Audit Trail for tracing through the cells used to calculate a value in a certain cell. (This one is particularly good for working out how a value is reached.) Allocate will make a "best guess" at missing values in a series of numbers and Forecast will predict values based on data already in your worksheet. Finally, the Curve Builder will calculate dynamic relationships, building several types of curve including some with one or two independent variables and S-shaped curves.

SuperCalc is loosely integrated with other CA products in a suite called CA-Office but does not offer the same level of easy data exchange as the Lotus or Microsoft suites.

When we reviewed SuperCalc last year in the spreadsheet round-up, it was a new release, shiny in its new Windows garb. While several other spreadsheets in this review have not been upgraded since then, they are products which have nearly reached the peak of what can be expected of a Windows spreadsheet. SuperCalc 1.0 is very much a first attempt at a Windows product with lots of scope for improvement. We spoke to Computer Associates and were told

that future plans for SuperCalc include bundling it with other CA software, and continued maintenance and upgrading as required, but there are no plans for a new release.

## PCW Details

### SuperCalc for Windows 1.0

**Contact** Computer Associates  
01753 577733. Fax 01753 825464  
**Price** £84

**Good Points** As an upgrade for DOS SuperCalc users it's perfectly competent, especially the macro conversion.

**Bad Points** Poor adherence to Windows interface conventions, lack of recent developments.

**Conclusion** Not to be recommended. Not as easy to use as other spreadsheets, doesn't offer the same breadth of features, and CA's plans for its future don't sound inspiring.



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# Lotus 1-2-3 Release 5

Personal Computer World  
EDITOR'S CHOICE

1-2-3 for Windows Release 4 was Lotus's first really successful Windows version and it was an excellent product, but already Lotus has moved on to Release 5. Does it keep up the good work?

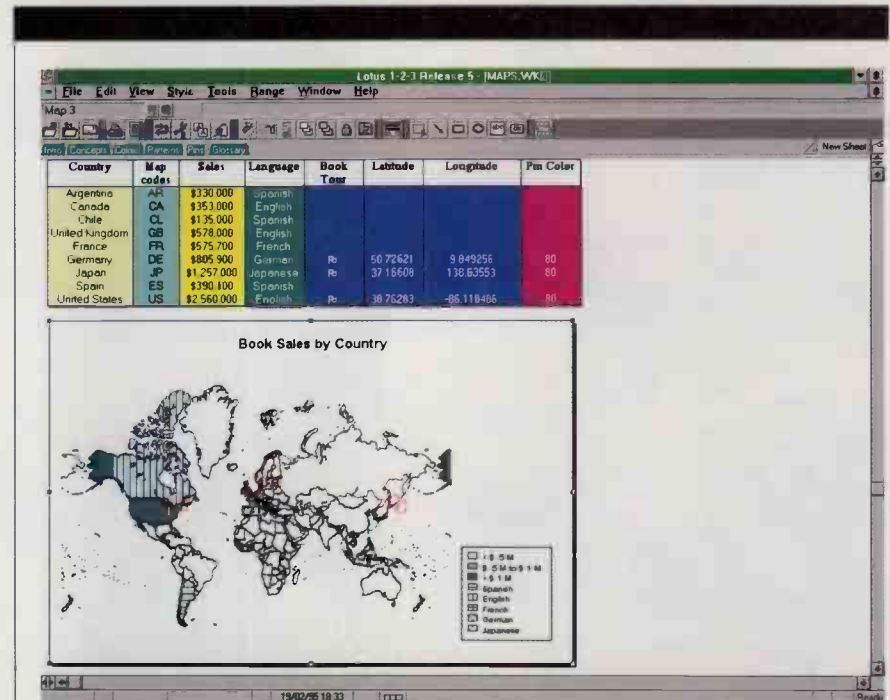
It can be taken as read that 1-2-3 Release 5 (the 1-2-3 will be silent from now on) offers all the features and functionality you would expect from the company with the name synonymous with spreadsheet. It has worksheet tabs, SmartIcons (Lotus persists with this curious nomenclature for what the rest of the world calls buttons) which you can mix and match to build a personalised button bar, a Version Manager and a good selection of spreadsheet publishing tools.

Small touches like being able to double-click on a cell and edit therein, and the task-specific cursor which operates when moving or copying on the worksheet, are very handy. When the cursor is positioned on the edge of a cell or a block, it changes to look like an open hand indicating that you're now able to pick up the cell/block. Clicking with the mouse changes the cursor into a clenched fist, showing that you now have a firm grasp of the cell and are free to move it around. When copying, the hand and fist have a + symbol on them to make it quite clear what's happening.

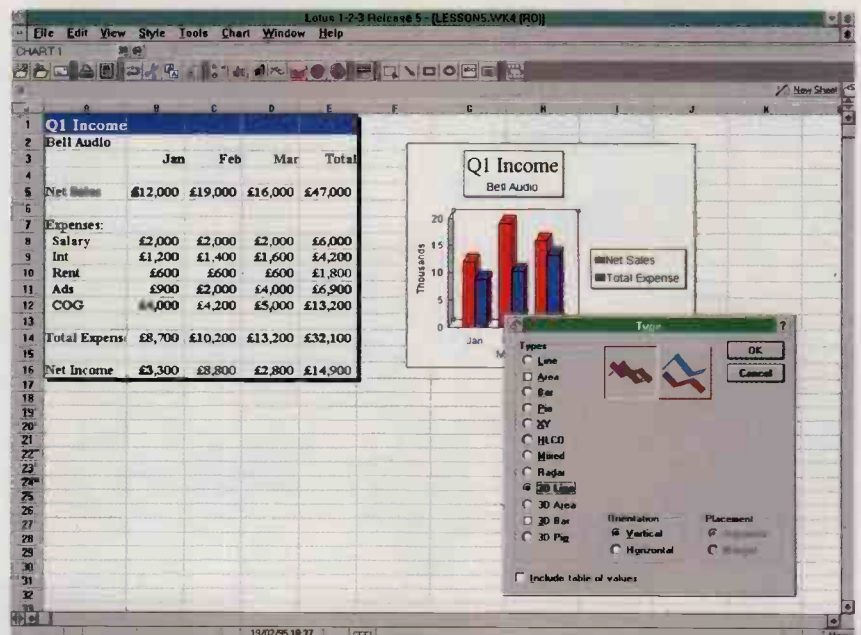
Charts can be embedded into worksheets and edited *in situ*, but the range of charting facilities are still bettered by Excel and Quattro Pro. There are eight chart types, four of which are also offered with a three-dimensional look.

Release 5 introduces SmartMasters, a series of templates covering a wide range of business activities including invoices, personal budgets and loans. You can build your own SmartMasters, a useful feature for businesses designing in-house worksheets and forms. When you load a SmartMaster it does so into an unnamed file, a safety feature to ensure that you never overwrite your precious data.

The Fill-by-example feature has been improved, making it easier to use. It works with sequences like days of the week, or months, numbers and even a mixture of text and numbers (Part 1, Part 2 etc). Enter the start of the sequence (say, Monday), highlight the cell and cells to contain the rest of the sequence (either below or to the right of the first entry),



*Lotus 1-2-3 is unique among those spreadsheets tested in that it has the ability to map geographical data. This is visually pleasing, but see the text for restrictions*



*1-2-3 has good charting features. Particularly useful is the way the mouse cursor changes as it is moved across a chart, to show the user which object will be accessed if the mouse is clicked*

then right mouse click the range and select Fill by Example. This feature can also be applied to a series of worksheet names. Worksheet tabs can be colour-

coded for easier identification, which sounds trivial but isn't.

Database connections, which were already good in the last release, have



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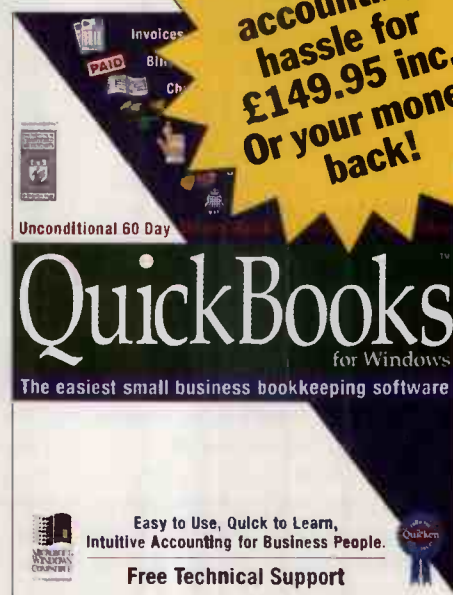
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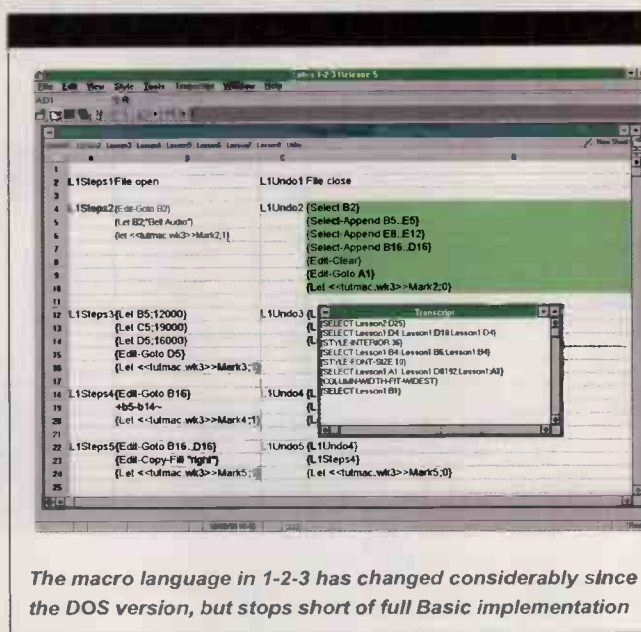


undergone further refinements. A high level of compatibility exists between 1-2-3 and Approach, Lotus's DBMS: users with Approach 3.0 can make use of the database functionality from within Release 5. Approach reports and forms can be created from menus in Release 5, enabling for example a data input form from Approach to be used for inputting data into a worksheet. Even mailing labels and dynamic crosstabs can be built in this way. Adding database functionality to a spreadsheet is Lotus's answer to those of its long-time users who use a worksheet as a flatfile DBMS. Users will always choose to use a product with which they are familiar in preference to learning a whole new one, especially DBMSs which still carry the stigma of being impossibly difficult to learn and use. Using Release 5 for storing flatfile data tables, even with its links into Approach, doesn't give you the functionality you could expect from a purpose-built DBMS, but it will do the job so long as you don't ask too much of it. So, the links to Approach are good. Our only reservation is that Approach isn't the best relational DBMS in the world.

For users of other DBMSs, Release 5 comes with DataLens and ODBC drivers which will permit external database tables to be handled as if it were a range on a worksheet. One glaring omission is a driver for Access, one of the bestselling Windows RDBMSs.

Extra help is available from bubbles. If you pause the cursor briefly as you pass over a button (sorry, SmartIcon) a comic-type bubble appears bearing a brief description of the SmartIcon's function. The bubbles don't get in the way if you know what you're doing and provide a helpful prompt for the unsure. The live status bar at the bottom of the screen has also changed somewhat, now letting you inspect and edit the properties of the current selection. All the usual cell formats are present, including fixed, percent, dates and times in various layouts, British pounds and US dollars. You can also define currency formats to add to the list, so if you calculate in French francs or Norwegian krone, they can appear too. In currency matters, Lotus scores with an innovation: different currencies can be displayed simultaneously on a worksheet.

The drag and drop facility now works



*The macro language in 1-2-3 has changed considerably since the DOS version, but stops short of full Basic implementation*

between worksheets within a file and between worksheets in different files. It's a slow process unless your PC has lots of memory; without a reasonable chunk of spare capacity it results in some frantic swapfile activity. If you use another application which supports OLE2, you can drag and drop between them too, but the comment above about memory is repeated in spades.

Release 5 comes with mapping tools. These are great fun to play with, but there are limitations to their usefulness. The mapping add-on is produced by the California-based Strategic Mapping Inc, and it shows. There are several maps of various bits of the States, but the UK is only represented as part of Europe. Worse, the only divisions of the UK which are available are those defined by the EU: county boundaries are not supported. We're growing more Eurocentric, which is all to the good, but there are many companies which never wish to collect data on their worksheets pertaining to anywhere outside the UK. You can, of course, zoom into a selected part of the Europe map, but it's tedious and leaves one feeling marginalised and irritated. Strategic Mapping Inc will, apparently, supply customised maps, but a little more effort on Lotus' part to localise the product for the UK and other European countries would make us all very happy.

The maps themselves also lose their good looks when you zoom in for closer inspection, with the outlines beginning to look rather angular. Printing (in our case on a DeskJet 510) reveals further shortcomings: if a country or area has been filled in a colour, the fill does not extend

right to the edges but leaves untidy ragged gaps of white space within the boundary, and is certainly not good enough to use for top-flight presentations.

Another limitation is the state of flux in which several areas of the globe find themselves. The mapping software cannot keep pace with the rapid changes but it allows you to make your own "mappings" (for instance, replacing Czechoslovakia with Czech Republic) which will be saved for future use.

Lotus provides a selection of worksheets full of demographic data, which is interesting though probably of limited value. Intriguingly,

some of the EU demographic data is defined by NUTS regions; we wondered if there was any subliminal take-home message in this, and it got worse. It appears that NUTS is the Nomenclature of Territorial Units for Statistics, which is even odder because the acronym should surely be NTUS. Paranoid, us?

Release 5 comes as part of Lotus' SmartSuite which also includes Approach, Ami Pro, Freelance Graphics and Organiser. The level of integration between the elements is generally good, especially between the spreadsheet and DBMS as already mentioned.

1-2-3 Release 5 has several improvements over the last version. You may want it for its mapping capabilities or for one of its other additions which answers a long-felt want. Even without these additions it is wonderfully efficient. The attention to detail is remarkable and Lotus has clearly got its Windows act well and truly together. The only feature missing is multi-dimensional spreadsheeting. But as Lotus is distancing itself from Improv, we can expect to see this in a future release.

## PCW Details

### 1-2-3 Release 5 for Windows

**Contact** Lotus Corporation  
01784 455445. Fax 01784 445186  
**Price** £365

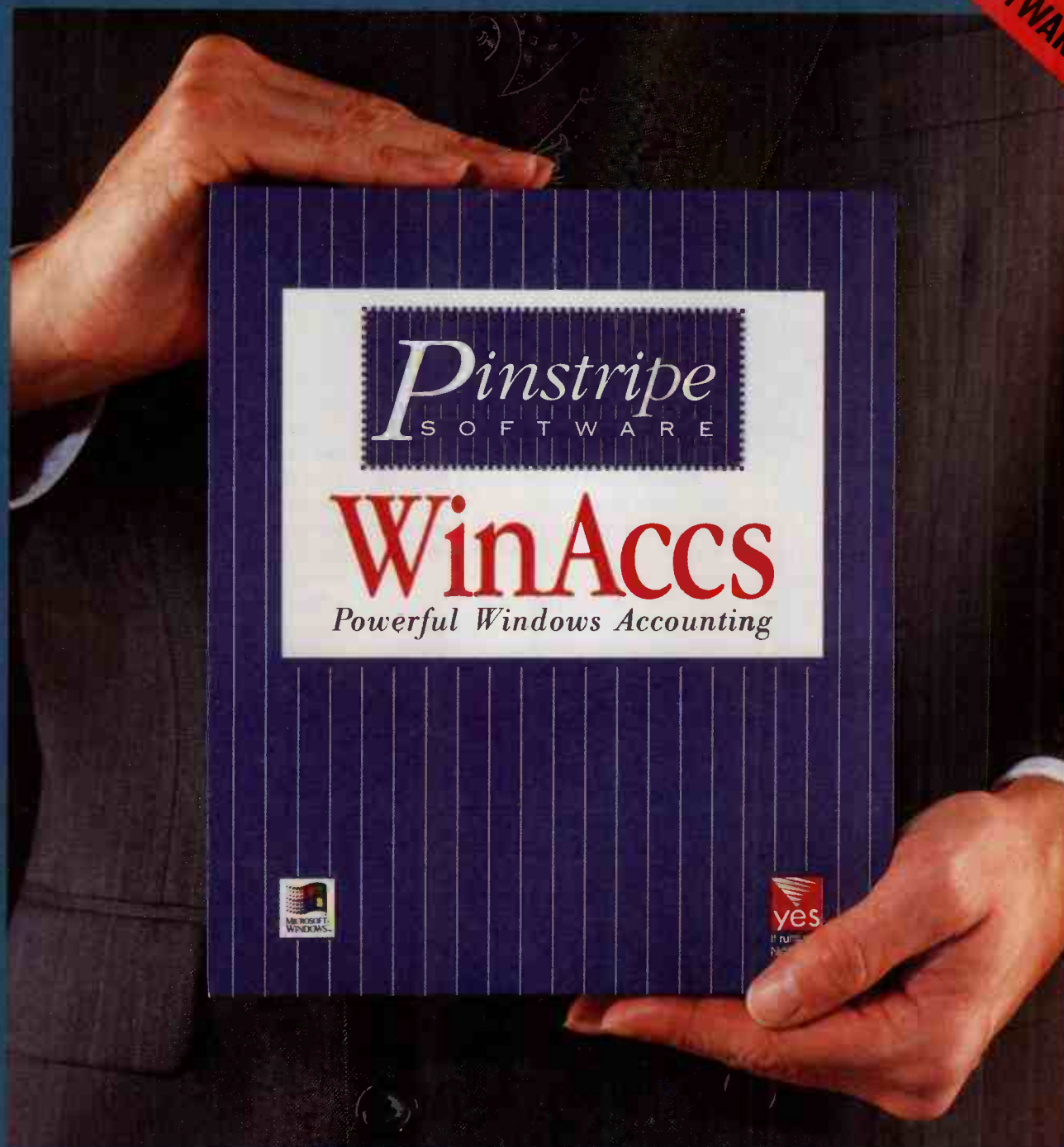
**Good Points** It works, it's fast and the detail is excellent.

**Bad Points** The mapping software feels like an attempt to gild the lily. Better to have included multi-dimensionality.

**Conclusion** Any product is the sum of its parts. 1-2-3 has all the right bits.



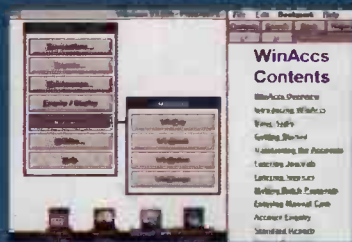
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## Other spreadsheets

Improv was released by Lotus as a total rethink of the way a spreadsheet should work. It first appeared on the NeXT machine and then under Windows in 1993. Radically different from a conventional spreadsheet, Improv's great strength is handling multi-dimensional data. If you need to store information about sales made by different people, selling different products, in different regions, each month over several years, then Improv was designed for you.

At the time of release Lotus claimed that this form of data manipulation was impossible as an add-on to a conventional spreadsheet, so it said there was no conflict in having two Windows spreadsheets in its product line-up. However, since then, multi-dimensional capabilities have appeared in all the major Windows competitors. True, Improv is still the purest implementation, but the others have the advantage of providing all dimensional levels in a single package. Lotus has recently announced that the development of Improv has ceased. We leave it up to you to guess what new functionality will appear in the next release of 1-2-3 for Windows. Let's hope that the stylish dialogue boxes from Improv also appear in 1-2-3.

DOS spreadsheets are fast, functional, efficient... and dying. It isn't the lack of functionality that is killing them, it's the spread of GUIs, notably

Windows. DOS packages now look old-fashioned and the interfaces are less intuitive to use. Features such as multi-dimensionality are much better suited to the fine screen control that a GUI offers. Some of the DOS spreadsheets have acquired their own GUIs which can address these criticisms. However, they impose the inevitable overhead of graphical screen control without the advantages of Windows: "multi-tasking", cut and paste, and OLE.

Nevertheless, these products can offer speed and power on a low-spec PC and will continue to sell for several years. So, what are the pros and cons of the packages on offer?

Lotus 1-2-3 now comes in two flavours for DOS. Release 2.4 is essentially a development of the original DOS version with an added GUI. It cannot manipulate three- or multi-dimensional worksheets, but it does offer macros, charting, WYSIWYG, landscape printing and goal seeking. It will read and run the thousands of 1-2-3 macros that still exist.

Lotus 1-2-3 Release 4 looks and feels much more like a DOS version of 1-2-3 for Windows. It can run in graphical mode, whereupon you get tabs at the top of the screen to access a three-dimensional stack of worksheets. You also get a live status bar which works in just the same way as in its Windows sibling. It has also inherited much of the

advanced functionality which is missing from 2.4. This includes a version manager, spell checker, graph editor, DataLens access to external databases, cell notepad and mail enabling. All this with the famous "/" menu system which Lotus defended so litigiously about five years ago, a protective attitude which with the benefit of hindsight (particularly through a Window) appears ridiculous.

**SuperCalc Version 5.5** SuperCalc has been around for years, and it also uses the / key to access a menu system. However, in this case the menu system is similar to, but different from, that of 1-2-3 for DOS. It offers three- but not multi-dimensionality, fast recalculation and internal database functionality. The context-sensitive help is very good — better than that offered by most of the opposition. But the product is showing its age in areas like spreadsheet publishing. This version has an improved page preview, and the printer and font support have been upgraded, but it is still not up to the DOS competition.

**Quattro Pro 5.0 for DOS** comes with a choice of interface; the text-based interface is probably best if your hardware is particularly long in the tooth because the GUI can make things rather slow. But it's undoubtedly better looking so a compromise would be to use the GUI just for spreadsheet publishing.

The Annotator (for creating and

embellishing charts) provides the many features for publishing, including control over fonts, clip art, colours and arrowheads. The slideshow maker will display your handiwork to great effect using its range of 24 effects for fades and other moves from one slide to the next. Other useful features are the nameable worksheet tabs which ease movement between worksheets, and the optimiser which lets you explore "what if" scenarios.

Quattro Pro for DOS is the pick of the bunch, an excellent full-featured spreadsheet which doesn't leave DOS users feeling out in the cold.

• See the Table of Features, page 477, for contact numbers.

### SuperCalc for DOS

| Type   | Qty     | Yr     | Wine                      | Bin    | Ready     | Value      | Tot Val |       |
|--|---------|--------|---------------------------|--------|-----------|------------|---------|-------|
| Cab  | 1       | 74     | Beaulieu Latour Cab Split | 5      | 79        | 46         | 46      | 0     |
| Bord   | 1       | 61     | Brane Cantenac            | 45     | 85        | 89         | 89      | 3     |
| PNoir  | 4       | 81     | Calera Jensen Pinot Noir  | 46     | 90        | 12         | 48      | 0     |
| Zin  | 1       | 81     | Calera Zin Cienega        | 57     | 86        | 10         | 10      | 0     |
| Chard  | 3       | 79     | Chateau St. Jean Chard, M | 7      | 88        | 20         | 60      | 0     |
| Ital   | 1       | 73     | Conterno Barolo           | 18     | 79        | 15         | 15      | 1     |
| Sweet  | 1       | 75     | D'Yquem                   | 7      | 90        | 75         | 75      | 7     |
| Chmpg  | 2       | 71     | Dom Perignon Champagne    | 10     | 80        | 71         | 142     | 0     |
| Cab  | 3       | 80     | Felton Empire Hallcrest C | 8      | 87        | 20         | 60      | 0     |
| Sweet  | 2       | 82     | Felton-Empire LH Riesling | 6      | 87        | 20         | 40      | 8     |
| Chmpg  | 2       | 72     | Korbel                    | 36     | 80        | 20         | 40      | 5     |
| Bord   | 6       | 82     | Leoville Las Cases        | 5      | 89        | 65         | 390     | 5     |
| Bord   | 1       | 81     | Margaux                   | 3      | 91        | 45         | 45      | 0     |
| PNoir  | 2       | 70     | Martini Pinot Noir        | 11     | 77        | 20         | 40      | 8     |
| Chard  | 1       | 78     | Mirassou Chard            | 7      | 84        | 27         | 27      | 0     |
| Cab  | 3       | 78     | Mondavi Reserve Cab       | 2      | 82        | 22         | 66      | 8     |
| Total Value =  |         |        |                           | £2,202 |           | 56 Bottles |         |       |
| Blank  | Copy    | Delete | Edit                      | Format | Global    | Insert     | Justify | Load  |
| Output   | Protect | Quit   | Save                      | Title  | Unprotect | Window     | Zap     | 1-2-3 |
| /more  |         |        |                           |        |           |            |         |       |
| 2>/  |         |        |                           |        |           |            |         |       |
| END Sort spreadsheet (or specified range) by a column or row |         |        |                           |        |           |            |         |       |
| NUM  |         |        |                           |        |           |            |         |       |

SuperCalc has a typical DOS interface. Pressing the / key brings up a 1-2-3-like menu but at the bottom of the screen, presumably to avoid litigation

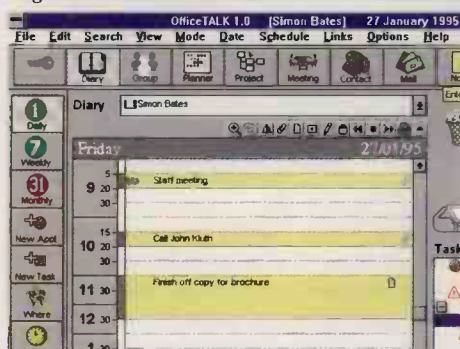


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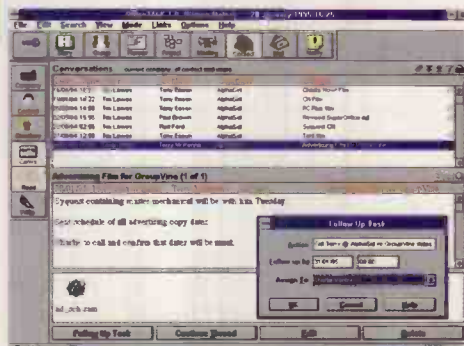
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## Case Study: Dr Clive Randall

"I work for Atlantic Power & Gas (APG) which supplies management services to companies like Oryx, Energy Company UK, Hamilton Brothers, BP, Shell, Phillips Petroleum — large oil-producing companies. The current contract I'm involved in with Oryx is the operatorship of three oil fields. This has never been done before by a contracting organisation such as APG so it's a very exciting project. It revolves around performance reporting, and that's where the use of spreadsheets comes in."

*In broad terms, what do you use spreadsheets for?*

I use spreadsheets for modelling or reporting cost and time, presenting the information graphically and in tabular form. Some of the largest work I've done with spreadsheets has been cost modelling, another form of cost reporting where there are relationships between costs which tie back to fundamental cost drivers. The spreadsheet allows people to decide on the basic cost drivers (manpower, offshore activities and so on) and, using the cost relationships, predicts costs in all the other categories associated with those cost drivers. It gives you a picture of the total cost of an asset, for instance, given a particular scenario. Again, it's a form of cost reporting but it's used for optimisation, or budgeting.

*Which spreadsheets do you use?*

My background is originally with Intersheet on a Beeb and I also played around with SuperCalc on DEC Professionals. I moved on to the revolutionary Quattro Pro about three or four years ago, then to Lotus 1-2-3, and now I'm using Excel. I've ended up swapping between spreadsheets depending on the client's requirements.

*Which do you use more, and which do you prefer?*

It has been decided that Microsoft will be the standard product for APG's general use, so recently I've used Excel primarily and Lotus if I have a chance.

*So does this imply that you prefer using*

*Lotus given no client requirement?*

To be fair to both products, I have had a lot of experience with Lotus. The cost modelling I was doing for Phillips Petroleum for the Ekofisk and Eldfisk fields (the optimisation cost modelling) was all using Lotus. It took the best part of a year and resulted in around 80 linked spreadsheets taking 120Mb of storage — a seriously huge model. So I've got a lot of experience in Lotus and I haven't had the same amount in Excel, but the experience I have had shows Excel to be slower but friendlier for a novice. It seems to be a lot glitzier and slicker but, if I wanted to do some big number crunching, it does seem slow.

*What sort of memory do you have on the PCs you're running the models on?*

I had 20Mb on a 66MHz AJP notebook PC for the large model, and a 350Mb hard disk. The PC I've just changed to is a Compaq 75MHz which currently has only 8Mb RAM but it's being upgraded to 20Mb.

*Given that you have used Lotus and Excel, what do you find are the strengths and weaknesses of both?*

Excel has very sophisticated, powerful list handling facilities (pivot tables and so on) but to be honest they are not the kind of things I would expect to use in a spreadsheet. To give you an example, I set up a simple database structure in Excel which at the moment is set up as a dummy containing six records, and has something like 30 query tables and an output sheet. If I just change a query the 75MHz Compaq takes about 20 seconds for it to recalculate. It's very glitzy and it's very easy to set all this but compared with Lotus it certainly seems a lot slower.

Lots of little niggling things about Excel bother me. Though Excel has sophisticated database functions which are impressive, for me presentation is very important. A lot of the reports I produce go to senior management and are used for decision making and they have to look good. With Lotus I could easily change the scale of the symbol points so that they always looked in correct proportion to the size of the graph. With Excel, if I stretch a



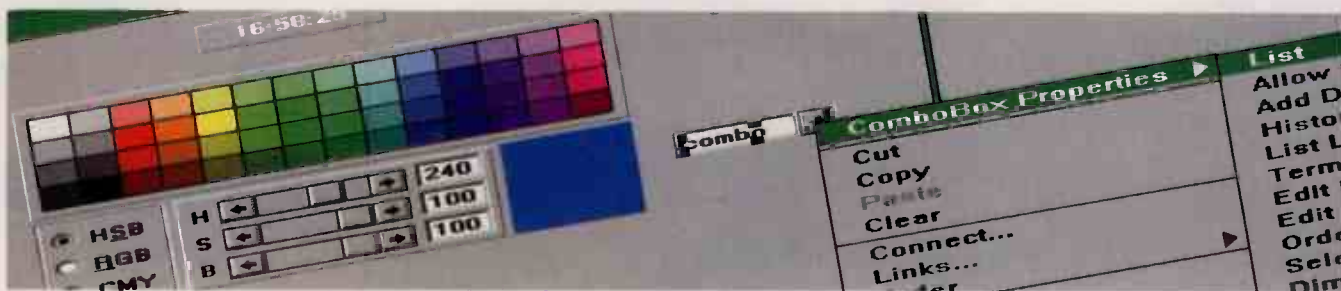
graph the symbol points get smaller and smaller and I haven't found a way of increasing their size, which is a niggling problem.

I also had to create menus for both Lotus and Excel. I found the Lotus dialogue box editor very easy to use with just a couple of small bugs, and it took me no more than an hour to create the first menu. Although Excel looked a lot slicker, I did find it took a lot longer to create the first dialogue boxes. Whether it's Lotus or Excel, I would like to see a closer integration between their database and spreadsheet products.

*Other features you'd like to see?*

I'd really like to see a much better way of automating and then compiling your worksheets. I have to try and make spreadsheets very simple for other people to use and very user-friendly, and that takes an enormous amount of time the way things are structured at the moment. I'd like to see more automation of the process for producing user-friendly interfaces and then compiling, because complex user interfaces can be quite slow. I know there's a product called Baler\* on the market which allows you to do that, but why isn't it part of the core functionality?

\*Baler is distributed by Eastern Software on 01206 44456.





## Spreadsheets: A Glossary

The meanings of some terms vary slightly from package to package, but the definitions below should get you started.

**Autosum** Microsoft usability research showed that by far the most common use of spreadsheets was for adding up.

Microsoft added an Autosum button to Excel and this was quickly copied by all the other spreadsheets.

**Cell** Most worksheets are divided by horizontal and vertical grid lines into cells, small oblong boxes into which you type your data.

**Columns** The vertical strips of cells which run down the length of the worksheet. The top of each column is identified by a letter.

**Database querying** User-friendly data handling provided by your spreadsheet. Imagine a huge database of information stored on a mainframe, accessed through an unfriendly, unwieldy interface. Why not use your familiar friendly spreadsheet to pull data across and process it?

**Embedded graphs** In early spreadsheets, graphs were constructed in a separate area, but can now be stored and manipulated on the worksheet.

**File format** The Lotus .WK file format is a standard which almost all spreadsheets can import, and now the Excel format is creeping in too.

**Formatting** Numbers can be formatted in several ways, including as integers, currency or dates. This alters the way they look, but not the number itself. For example, dates look perfectly normal on the worksheet (16/5/78) but are stored as numbers (32123) so that they can be manipulated later using functions. Most modern spreadsheets do this conversion automatically, though it's useful to know that there are inter-converting functions for storing a date string like '13/5/67' as a number.

**Formulae** These manipulate your data. A simple formula to add numbers in cells A1 and A2 reads +A1+A2 (the plus tells the spreadsheet that a formula follows). Functions (see below) are

frequently used in formulae.

**Function** An entity which returns a value, written in the form @SUM(range). The @ symbol tells

the program a function follows (spreadsheets store long lists of predefined functions) and Sum is the function itself.

Contained within the brackets is the argument (usually a range) on which the function is to be performed, hence

@SUM(b1..b7). Some functions don't need arguments but often retain the brackets: Rand(), which generates random numbers, is an example in some spreadsheets.

**Labels** The descriptive words you use to describe the contents of ranges of cells.

**Live graphs** These retain links to the data from which they are derived. If you change the data, the graph reflects that change.

**Macro** Tiny programs to automate tasks, they used to be written as lists of keystrokes (yuk!) but are now often written in Basic-like languages. Further speed up your weekly graph production with a macro to draw graphs from saved settings while you have a cuppa.

**Macro recorder** Turn on the recorder while you perform a task and it will write the macro for you as you work. Don't forget to turn it off.

**Macro translator** As spreadsheets evolve, macro languages change. Translators translate macros written for an earlier version, or macros written with a different package.

**Multi-dimensionality** Allows you to manipulate a matrix of data for viewing in many different ways, giving new insight into your data.

**Numbers** Three types of information can be placed in cells — numbers, labels and formulae (see below). Numbers are (not unreasonably) numerical data.

**Property Inspection** That's the Borland term. The Lotus term is ShortCut menus. A right mouse click on a cell, graph or other object pops up a list of items you can edit: colour, font etc.

**Range** A block of cells is described as a

range, often written as, say, (G12..G24). G12 is the first cell in the block and G24 the last, and the two are usually separated by two dots. Ranges can be from a single column or row (B4..G4) or a block covering many (B4..G16).

**Rows** Looked at another way, cells occur in horizontal strips across the worksheet, identified by numbers at the left edge of each row.

**Saving graphs/saving settings** When you save a graph, you're saving a picture of the graph as you see it now. If you save the graph settings, the graph can be rebuilt at any time using the same range of data. If the data has changed, the graph reflects the change. If you produce graphs for various weekly reports, use saved settings to speed up the weekly ritual.

**Solver** Helps solve "what-if" problems using data you already have. You define the problem (I have x members of staff, overtime costs y per hour, I need to produce z whimsies by d date. Should I pay the overtime or employ temporary staff at p per hour, or pay some overtime and employ a smaller number of temps?). Solvers produce a variety of solutions for you to review.

**Spreadsheet** An abused term, often misused to mean both the software and its output, thus causing confusion. Consider the word processor: you wouldn't call the letters you write "word processors", you'd probably call them documents.

So spreadsheet should simply mean your chosen package, and the work you produce is a worksheet.

**Three-dimensionality** When you save a stack of related worksheets and write formulae to combine data from all of them, you are using your spreadsheet's three-dimensional capabilities.

**Worksheet** A single sheet of cells (see below) on which your data is stored.

**Notebook (aka Workbook)** A collection of several worksheets containing associated data can be stored together as a notebook.

| Country        | Map codes | Sales       | Language | Book Tour |    |
|----------------|-----------|-------------|----------|-----------|----|
| Argentina      | AR        | \$330,000   | Spanish  |           | 80 |
| Canada         | CA        | \$353,000   | English  |           | 80 |
| Chile          | CL        | \$135,000   | Spanish  |           | 80 |
| United Kingdom | GB        | \$578,000   | English  |           |    |
| France         | FR        | \$575,700   | French   |           |    |
| Germany        | DE        | \$805,900   | German   |           |    |
|                | JP        | \$1,257,000 | Japanese |           |    |
|                |           | \$390,100   | Spanish  |           |    |
|                |           | \$550,000   | English  |           |    |



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## Editor's Choice

The DOS spreadsheet is becoming a rare animal. Even getting a price for Quattro Pro required three phone calls to Novell. It is also clear from the prices quoted that some companies are actively trying to discourage the sale of DOS products; presumably they would rather support only one version.

All of which seems sad because DOS was the evolutionary cradle for the spreadsheet. However, it makes it very easy to pick a DOS winner. Lotus 1-2-3 in either guise is a perfectly competent spreadsheet but it is too expensive. SuperCalc is much more competitively priced but lacks spreadsheet publishing capabilities. Quattro Pro for DOS is a clear winner, not only in terms of price but also functionality. It can run in text or graphics mode, has a wonderful charting/presentation section and great

publishing. If you want to run a spreadsheet under DOS, this is the one to choose.

On the Windows front, certain products are clearly non-starters. SuperCalc for Windows felt ragged at the edges a year ago and it hasn't got any better. It may be priced competitively but that wouldn't induce us to buy it. Improv was a wonderful product, and you can still buy it, but its development is finished. Buy it if you are sure you need its special features and are aware that 2.1 is the final version.

This leaves us with Quattro Pro, Excel and 1-2-3, and here the decisions are less clear. Quattro Pro is a great product and if only it exercised the hardware less brutally it would walk away with the Editor's Choice. If you have serious hardware then give it your earnest consideration, otherwise choose from the other two.

We agree with Dr Randall: Excel is very smooth, carefully manicured, and almost too slick. It's as if too much of the development effort has gone into making a product which has the appearance of working well, which is not quite the same thing as giving a product a genuinely good user interface. Not that there is any suggestion that Excel is a poor product; we use it frequently and find it perfectly satisfactory. But Lotus 1-2-3 Release 5 still has that faint edge, even without the multi-dimensionality which it will surely acquire in Release 6. It gives the impression that under the cuddly exterior there is real power, the iron fist in the velvet glove. Excel, on the other hand, can feel a little like the velvet fist in the velvet glove. With that in mind, the Editor's Choice for this year has to be Lotus 1-2-3 Release 5.

## Scenario and Version Management

It became clear as spreadsheets began to gain popularity that people were using them, not only to store current data, but to try and model what would happen in the future. The problem with the future is that it is uncertain. "Are we going to pay a two, three or four percent pay rise this year?" "Will we get that big order?" There are several strategies for dealing with this sort of modelling in a conventional spreadsheet.

You can create copies of the worksheet which differ only in the relevant, critical values (such as pay rise). In practice these are difficult to keep up to date, and the number of worksheets rapidly becomes unworkably large as the number of interacting variables increases. An alternative is to keep the data in a single worksheet and write a series of macros which will change the critical values

as required. This works better, but requires more expertise to construct and maintain.

Modern spreadsheets are appearing with features which address this problem directly, providing easy to use interfaces which allow the user to design different scenarios for a single worksheet. Of the tools available, the Version Manager in Lotus 1-2-3 for Windows is probably the most highly developed.

Suppose you build a worksheet with cells that contain information about the projected inflation rate for the next three years. Optimistically, you enter the numbers 1, 2 and 2.5. With the range highlighted, you choose Range|Version, give the range a name (VAT) and assign a name to this version of the future (Optimistic). Then you enter more reasonable figures, say 2, 2.5 and 3, storing these under the name Realistic. You can add

more versions of the VAT figures, and you can also define more ranges of cells (perhaps Pay and Big Order) and give each of those their different versions. Swapping between versions is then just a matter of selecting from a list the ones you want to see.

You can annotate the versions with a note giving details of the reasons for your figures, and each version is marked with your name. As you pass the worksheet around, different people can add their versions, give their reasons, and each is traceable to its originator.

As a final refinement, you can tie different sets of versions together (the high rate of VAT, with the large pay rise and no big order) to form a Scenario. Version management is far too useful to ignore and, like multi-dimensional spreadsheeting, will be around for some time yet.

## 3D and Multi-Dimensionality

The early spreadsheets allowed us to work in two dimensions only. As a manager, you might use this two-dimensional space to list your salespeople along the top and the items they sell down the lefthand side. Then, in the appropriate cells, you could put the number of items sold by each person. This matrix becomes three-dimensional as soon as you, say, start collecting this data month by month. In the early spreadsheets, the easiest way to accomplish this was to build a separate worksheet for each month. Soon, spreadsheets evolved to allow you to manipulate multiple worksheets on screen at the same time and this became known as three-dimensional spreadsheeting. The early implementations were highly unwieldy, and the process only became intuitive under Windows when tabs were

used to access the separate sheets. Three-dimensional worksheeting is now widely used as a sensible extension to the original two-dimensional concept.

Clearly, many data sets are actually multi-dimensional; in this case "multi" meaning more than three. For example, if you want to store information about the number of each product sold, what size the product was (small, medium, large), by which salesperson, in which month and in which region, you have a five-dimensional matrix of data. Designing an interface which represents multi-dimensional data meaningfully on a two-dimensional screen represents something of a challenge, particularly as it has been found that in practice users often want to manipulate their view of the data. They want to see the total sales of all the products by

region, or the sales of a particular product that each salesperson has achieved over the last six months.

So, multi-dimensional spreadsheeting, as exemplified by Improv, is not simply an extension of three-dimensional. Instead, each dimension is a named entity with a specific number of named components. This structuring instantly imposes a high level of organisation on your data. No longer can you use that odd corner of a worksheet for a quick VAT calculation because there are no odd corners. However, the benefit of this organisation is that you can manipulate the dimensions to allow the data to be viewed in new ways.

Multi-dimensional spreadsheeting will probably not replace its simpler progenitors, but it is certainly here to stay.



TABLE OF FEATURES SPREADSHEETS

|                                   | Novell       | Microsoft    | Lotus        | Computer Associates | Lotus        | Lotus        | Lotus        | Computer Associates | Novell       |
|-----------------------------------|--------------|--------------|--------------|---------------------|--------------|--------------|--------------|---------------------|--------------|
|                                   | WINDOWS      |              |              |                     |              | DOS          |              |                     |              |
| Product                           | Quattro Pro  | Excel        | 1-2-3        | SuperCalc           | Improv       | 1-2-3        | 1-2-3        | SuperCalc           | Quattro Pro  |
| Version number                    | 6.0          | 5.0          | Release 5    | 1.0                 | 2.1          | Release 4    | 2.4 for 286  | 5.5                 | 5.0          |
| Supplier                          | Novell       | Microsoft    | Lotus        | Computer Associates | Lotus        | Lotus        | Lotus        | Computer Associates | Novell       |
| Phone                             | 01344 724000 | 01734 270000 | 01784 455445 | 01753 577733        | 01784 455445 | 01784 455445 | 01784 455445 | 01753 577733        | 0800 177277  |
| Fax                               | 01344 724001 | 01734 270002 | 01784 445186 | 01753 825464        | 01784 445186 | 01784 445186 | 01784 445186 | 01753 825464        | 01344 724001 |
| Manufacturer's Price              | £285         | £269         | £365         | £84                 | **           | £455         | £375         | £79                 | £50          |
| Street Price                      | £149         | £219         | £230         | £64                 | £99          | £255         | £265         | £64                 | £35          |
| Upgrade price                     | £35          | £124         | £99          | £49                 | **           | £99          | £99          | £49                 | £35          |
| Processor                         | 386 or above | 386 or above | 386 or above | 386 or above        | 386 or above | 286 or above | 286 or above | 286 or above        | 286 or above |
| Minimum RAM                       | 4Mb          | 4Mb          | 4Mb          | 4Mb                 | 4Mb          | 2Mb          | 512kb        | 512kb               | 4Mb          |
| Recommended RAM                   | 8Mb          | -            | -            | -                   | 8Mb          | -            | -            | 640kb               | -            |
| 3-D                               | ●            | ●            | ●            | ○                   | ●            | ●            | ○            | ●                   | ●            |
| Multiple dimensions               | ●            | ●            | ○            | ●                   | ●            | ○            | ○            | ○                   | ○            |
| Max. rows                         | 8192         | 16384        | 8192         | 16384               | N/A          | 8192         | 8192         | 9999                | 8192         |
| Max. columns                      | 256          | 256          | 256          | 256                 | N/A          | 256          | 256          | 255                 | 256          |
| Max. notebooks per worksheet      | 256          | No limit     | 256          | N/A                 | 100          | 256          | N/A          | 255                 | 256          |
| Macro recorder                    | ●            | ●            | ●            | ●                   | ●            | ●            | ○            | ●                   | ●            |
| Circular references               | ●            | ●            | ●            | ●                   | ●            | ●            | ●            | ●                   | ●            |
| Backsolver/goal seeking           | ●            | ●            | ●            | ●                   | ○            | ●            | ●            | ●                   | ●            |
| Auditing                          | ●            | ●            | ●            | ●                   | N/A          | ●            | ●            | ●                   | ●            |
| Icon editor                       | ●            | ●            | ●            | ○                   | ●            | ●            | ○            | ○                   | ○            |
| Customise interface               | ●            | ●            | ●            | ●                   | ●            | ●            | ●            | ●                   | ●            |
| Edit in cells                     | ●            | ●            | ●            | ○                   | ●            | ○            | ○            | ○                   | ○            |
| Auto fit rows/columns             | ●            | ●            | ●            | ○                   | ○            | ○            | ○            | ●                   | ●            |
| Search & replace                  | ●            | ●            | ●            | ●                   | ○            | ●            | ●            | ●                   | ●            |
| Drag & drop                       | ●            | ●            | ●            | ○                   | ●            | ○            | ○            | ○                   | ●            |
| Spell checker                     | ●            | ●            | ●            | ○                   | ○            | ●            | ○            | ○                   | ●            |
| Print to fit                      | ●            | ●            | ●            | ●                   | ●            | ○            | ○            | ●                   | ●            |
| Margin change in preview          | ●            | ○            | ○            | ○                   | ○            | ○            | ○            | ○                   | ●            |
| Zoom preview                      | ●            | ●            | ●            | ●                   | ●            | ○            | ○            | ●                   | ●            |
| Place chart                       | ●            | ●            | ●            | ●                   | ○            | ●            | ●            | ○                   | ●            |
| Graph data range in one operation | ●            | ●            | ●            | ●                   | ●            | ●            | ●            | ●                   | ●            |
| Edit chart in-situ                | ●            | ●            | ●            | ○                   | ○            | ○            | ○            | ○                   | ○            |
| Control data version              | ●            | ●            | ●            | ○                   | ●            | ●            | ○            | ○                   | ○            |
| Create scenarios                  | ●            | ●            | ●            | ○                   | ○            | ●            | ○            | ○                   | ●            |
| Annotate versions                 | ●            | ●            | ●            | ○                   | ○            | ●            | ○            | ○                   | ○            |
| Save named queries                | ○            | ●            | ●            | ○                   | ○            | ○            | ○            | ○                   | ○            |
| "Find, extract, delete records"   | ●            | ●            | ●            | ●                   | ○            | ●            | ●            | ●                   | ●            |
| ODBC drivers                      | ●            | ●            | ●            | ○                   | ○            | ○            | ○            | ○                   | ○            |
| Quattro Pro WB                    | ●            | ○            | ○            | ○                   | ○            | ○            | ○            | ○                   | ●            |
| Lotus WK                          | ●            | ●            | ●            | ●                   | ●            | ●            | ●            | ●                   | ●            |
| Excel XLS                         | ●            | ●            | ●            | ●                   | ●            | ○            | ○            | ○                   | ○            |
| dBASE DBF                         | ●            | ●            | ●            | ●                   | ○            | ●            | ●            | ●                   | ●            |
| DIF                               | ●            | ●            | ●            | ●                   | ○            | ●            | ●            | ●                   | ●            |
| ASCII CSV                         | ●            | ●            | ●            | ●                   | ●            | ●            | ●            | ●                   | ●            |
| ASCII fixed length text           | ●            | ●            | ●            | ○                   | ○            | ●            | ●            | ○                   | ●            |

● = Yes ○ = No

\*\* Price no longer quoted by manufacturer, but copies still available from dealers

| Year | Quarter | Winery   | Cabernet Sauvignon | North | £165 | 320 |
|------|---------|----------|--------------------|-------|------|-----|
| 1991 | Q1      | Beaulieu | Cabernet Sauvignon | North | £165 |     |
| 1991 | Q2      | Beaulieu | Cabernet Sauvignon | North |      |     |
| 1991 | Q3      | Beaulieu | Cabernet Sauvignon | South |      |     |
| 1991 | Q4      | Beaulieu | Cabernet Sauvignon |       |      |     |
| 1991 | Q1      | Beaulieu |                    |       |      |     |
| 1991 | Q2      | Beaulieu |                    |       |      |     |

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1992

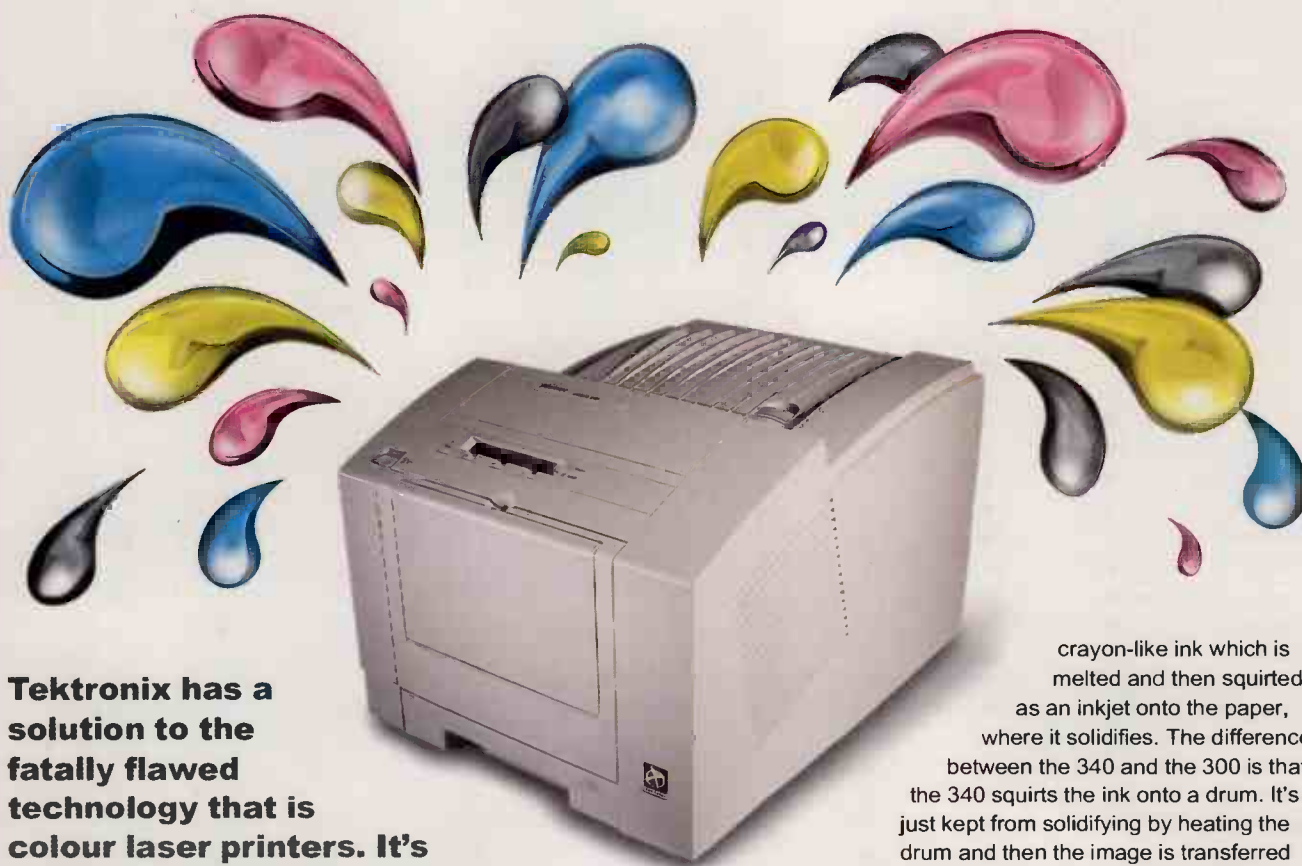
Q1 Q2 Q3 Q4

Cases Sold Cases Sold Cases Sold Cases Sold

100 1243



# A Phaser set to stun



**Tektronix has a solution to the fatally flawed technology that is colour laser printers. It's called phase change, and it's here in the form of the Phaser 340.**

**Simon Rockman waxes lyrical.**

**C**olour laser printers are disappointing. When I looked at the offerings from Xerox, QMS and Hewlett Packard in December 1994 I said that they were interesting pieces of technology but had limited markets. Even the new printers from Apple (using the Canon engine) and Tektronix have too many consumables, and are too complicated and expensive to buy and maintain.

Tektronix has just announced the Phaser 340, a printer which delivers the costs and quality people expect from colour lasers but haven't been able to get up until now. It's not a laser printer, it's phase change, the same basic technology as the Tektronix 300i and DataProducts Jolt. These use a solid

crayon-like ink which is melted and then squirted as an inkjet onto the paper, where it solidifies. The difference between the 340 and the 300 is that the 340 squirts the ink onto a drum. It's just kept from solidifying by heating the drum and then the image is transferred onto the paper which is sucked into the printer.

One of the great things about this new way of printing, which Tektronix has dubbed Transfix, is that the printers are simple. Unlike a laser printer, the drum isn't coated with any special chemicals and it's not a wearing part. Instead, it is lightly oiled. The printer is also quick for colour — almost four pages a minute — and there is plenty of room for improvement over that without radical changes to the technology. It's twice the speed of a thermal wax printer and an order of magnitude faster than a dye-sub.

This is the dawn of a new printing technology. The Phaser 340 is a combination of electronics, physics and, most importantly, chemistry. Tektronix hopes it





will evolve into a key printing method. The team responsible for the Phaser 340 have been working on it for four years; the heavy-duty Non-Disclosure Agreement I signed at the beginning of the year was to allow patents to be filed. Under American patent law any form of official disclosure could count as grounds for refusing the patents.

Pretty much the only conventional part of the Phaser 340 is the electronics. It has a 32MHz Adobe 2015 RISC processor with job pipelining; the pipelining helps the rendering speed tremendously. The standard model has 8Mb RAM and is expandable to 12Mb and 24Mb, the top specification being available as a separate model with 69 fonts in place of the standard 17. The standard configuration costs £3,995. The enhanced version, called the Phaser 340 Plus, costs £5,495.

The only poor piece of engineering in the whole thing is the printer port, which uses a "new standard" connector from Compaq. In place of a standard parallel connector there is a funny D-shaped thing which looks like the kind of connector used to attach a floppy drive to a notebook. This gives better bi-directional control so that the computer can find out more from the printer, but there is an

optional Ethernet port and Tektronix Phasershare software which will be used by anyone who is serious about control of the printer diagnostics. As it is, you need a special cable.

The engineering is quite basic. The ink is squirted through nozzles onto the drum by small piezo-electric drivers. These don't wear in the same way as bubblejets so the print head is not a wearing part. There is one aluminium plate with four sets of holes across the full width of the page, each of which handles a separate colour — yellow, magenta, cyan and black. Each hole is 3.5 microns in diameter, which, for those with particularly keen eyesight, is just enough to be spotted as a ridge on the aluminium plate. There are not as many holes as there are pixels on the page. While the page is up to 8.5in wide and the printer can manage 300dpi, there are only enough holes to cover a twenty-seventh of this — about 85 holes. The drum rotates 27 times and the plate steps one pixel at a time to build up the image. The speed of the drum, a little over 115rpm, isn't enough to dislodge the very dense ink, and the main advantage of printing onto a drum is that it is a known quantity.

*Print quality is exceptional for around 15p a page: colours are very strong*

A major problem for all printer designers is that they have no control over the paper used. If you look at the published specifications they are quite tight — Hewlett Packard even specifies humidity for the paper used in the Colour LaserJet — but in a real office environment everyone tends to use whatever is lying by the photocopier.

Paper stretches unevenly. If it were to be run back and forth through a printer 27 times, the registration would suffer as the paper is heated by the ink and rollers. By building up an image on the drum, Tektronix can control the registration precisely. With the complete image formed before it is transferred to the paper, the results are much better and there is none of the banding traditionally associated with large areas of heavy colour produced by an inkjet printer.

The ink density is also reduced when compared with earlier phase change designs. The 340 uses half as much ink as the 300 for a given print area but the



colours are very solid, the blacks being especially black.

Earlier phase change printers used smaller quantities of wax for the refills. The Jolt holds pellets in a plastic cartridge, while the Phaser 300 takes lumps shaped like a child's building blocks which are "posted" through different shaped holes like a child's post box. For the Phaser 340 Tektronix wanted a more businesslike analogy and a system which would cope with more printing before a refill was necessary. The solution was to make the ink storage analogous to a stapler. Ink is still held in solid wax lumps which are keyed so that only the right colours can be fitted into the right storage areas; but they are larger — big enough for 1,000 sheets — and will hold three of each colour. A front panel shows how much ink is left without the need to lift the lid.

The blocks are melted a bit at a time, which holds the first block into the machine and means that only a small amount of wax is kept melted. This keeps down the startup time and reduces the wax wastage if the machine is switched off.

Tektronix expects the Phaser to be left on most of the time. It will initially power down to a standby mode, a slumber from which it takes five minutes to awake, and then full Energy Star power trickle, but as with a start from cold this takes 15 minutes. This may feel like a long time when you are waiting for it but is significantly better than the Jolt's 24 hours when you first power it up.

The Phaser 340 is safe to move. There is a head lock which moves the plate away from the drum and this should be used if the printer is going to be shipped, but just sliding it around a bench is safe enough.

The cleverest bit of the design is the print head. This looks like a solid aluminium plate but is really a combination of 15 plates which are precision-laser drilled and then precision welded back to back. This allows very accurate channels and hollows, drilled to a fraction of a micron. The front plate has the piezo-electric heads. The cigarette lighters which generate a spark from your pressing a button also use piezo. The pressure creates a spark but it will work the other way around. If you put a current through a piezo crystal it kicks, and this is used to drive the ink onto the drum. The kick is much more predictable than the splattering of a bubble on a bubblejet and has fewer problems with spread. Bubblejets are good because they are much cheaper to manufacture, but they wear out; piezo is much tougher.

The machine melts enough wax for one page, determined from the printer's software investigating the page and calculating how much ink it will need. The wax is melted on demand so very little melted wax is held in reserve. There is a little hot-plate and the wax drops down a feeder into the back of the head.

The head is made up of 96 nozzles for each colour; the drum rotates and the plate steps. If one head becomes clogged, the band it leaves is 27 pixels wide, so to clean the head the whole array can be superheated and the excess wax purged. This is a much more efficient way of cleaning than blowing air through an inkjet system, which can become permanently clogged.

The heads run at a speed of 77kHz; more heads, a faster drum or a combination provide scope for a much faster system. Tektronix talks of a top speed of 200 pages per minute within the existing technology, but even then you start having

paper handling problems.

The whole unit is designed to be low maintenance. Colour laser printers typically have four sets of toner, four developer units, waste bins, lubrication parts, transfer belts and drums, all of which are expensive, wearing parts. The Phaser 340 has a slot for each colour of ink and a waste tray. Even the waste tray can be twisted and emptied, helping to keep the cost per copy at around 10p per page.

The 340 is so good that Hewlett Packard started explaining the limitations of the technology before the official announcement. The only one which seemed to carry any weight is that you cannot write on the output, but this is an advantage with many labelling applications. Tektronix also makes a higher resolution colour laser printer, the 540, which produces true 600 x 600dpi. The 340 is a true 300 x 300 but with the extra RAM it can step the drum at half the speed to produce a 300 x 600 image. In our tests, this cut the speed to just under two pages per minute. On a 200-page run, one page showed a PostScript bug which resulted in a stripy image, with regular vertical strips missing. This is clearly a firmware problem, but then, the review machine was a very early unit and the firmware is easy to fix. At 10p a copy it's easy enough to print another one.

The front panel gives all the necessary control information, with the menu navigated through a set of four buttons. A handy printout shows the menu tree. On a printer at this price, a bigger screen would add little to the cost but a lot to usability.

## Conclusion

The Phaser 340 is a significant printer. At PCW we are used to seeing the latest and the best: this month's ground-breaker becomes next month's old hat, but the Phaser 340 is such a leap forward it will take other manufacturers a long time to catch up. Tektronix is interested in selling more than just printers, however, and there may well be licences for this technology: the faded star in the printer market which could really do with this kind of leg-up is Epson. The development work on this printer has taken four years — it was time well spent.

**PCW**

## Print Quality

The immediate problem we faced with the Phaser 340 is that, as a new technology, there are no NSTL tests for the Transfix process. The Phaser 340 is targeted at the colour laser printer market and so we used those tests. The results were very interesting.

The colour quality from the Phaser 340 is much better than any toner-based system. Tektronix provides a number of colour settings including Vivid and Pantone. The Vivid setting is ideal for presentations and the print quality onto transparencies proved to be excellent. It produces slightly artificial looking photographs, but that's what the other settings are for.

The blacks are very black, but the resolution isn't as good as a monochrome laser printer. Very small text starts to fill in at 3pt but it becomes unacceptable at 2.5pt. Solid areas of colour butt up next to one another well. The results are better than any other printer we've seen, with very little drift between the colours.

Each printer technology has its own telltale artefacts and the one which gives the Transfix process away is a slight vertical banding. It is easiest to spot on a whole page of a single light colour but is noticeable on more complicated pictures.

The Phaser 340 isn't a rival for the high-end dye sublimation printers but it is startlingly good.



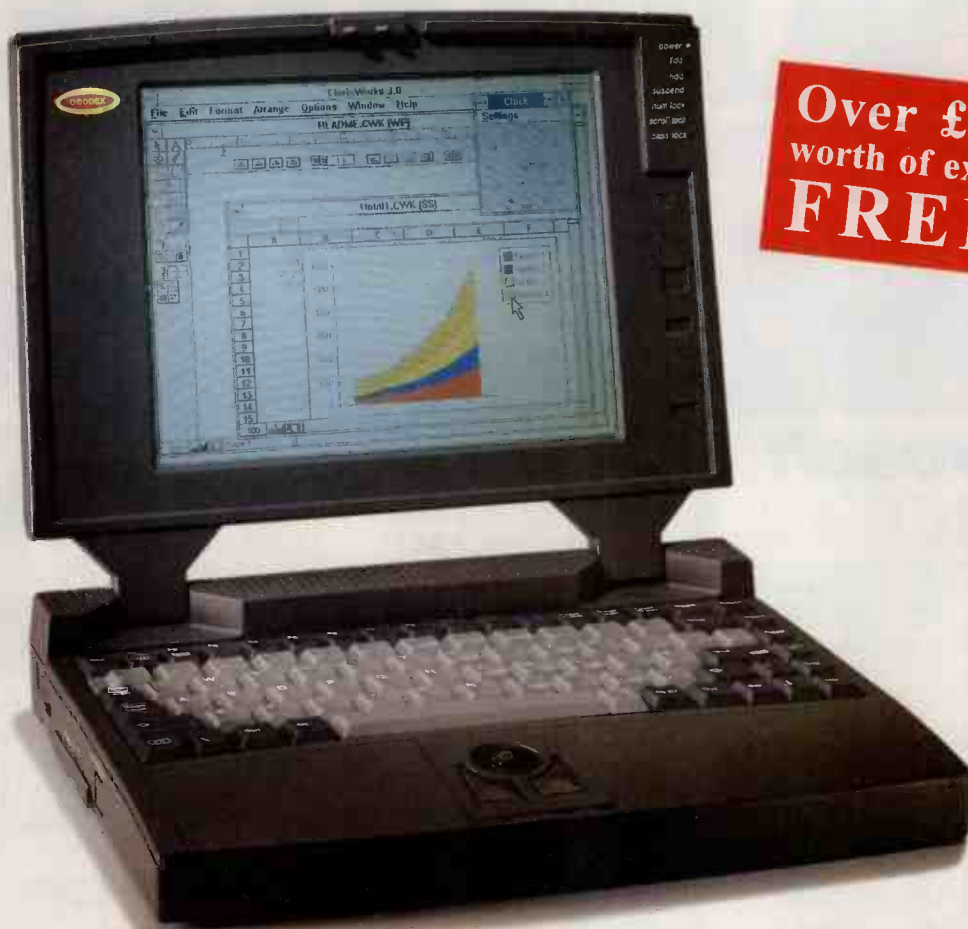
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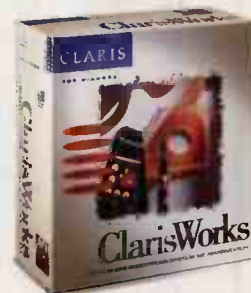
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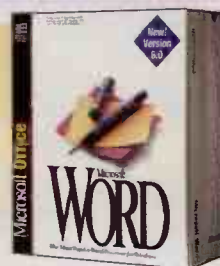


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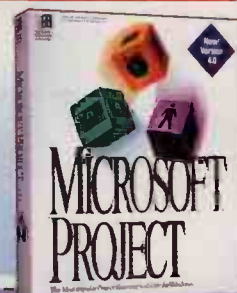
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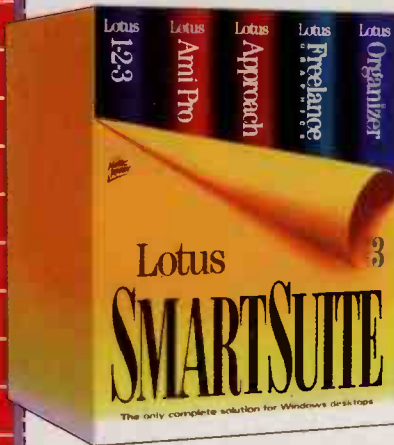
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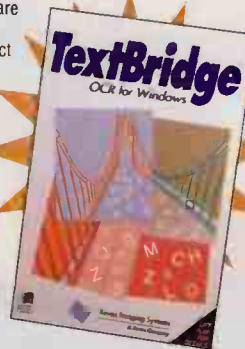
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Publisher: FastCAD Europe

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Manufacturer: NEC  
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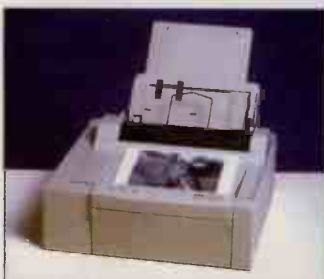


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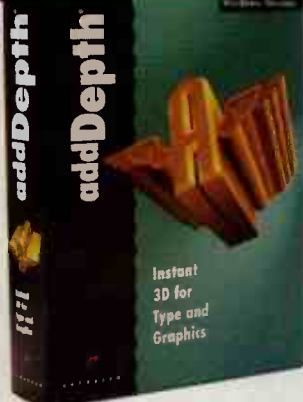
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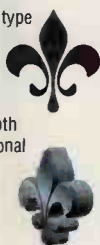
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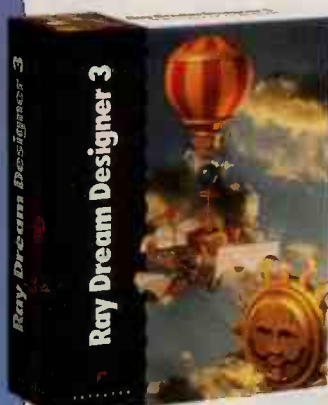
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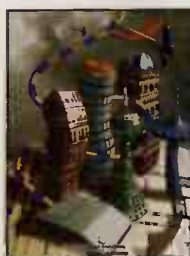


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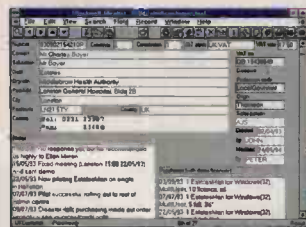
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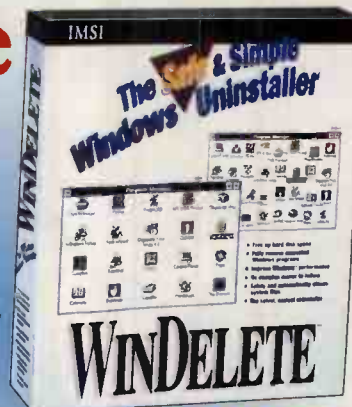
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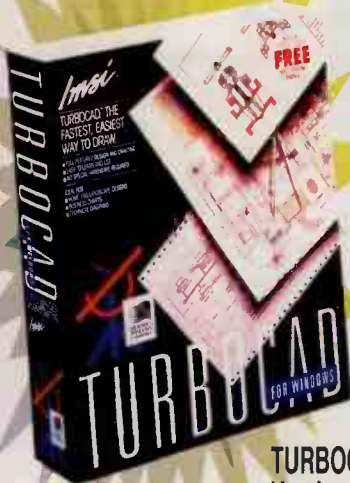
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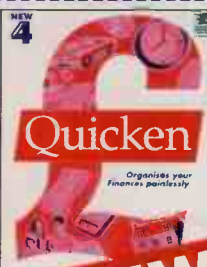


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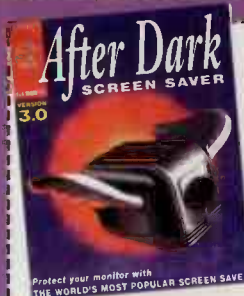
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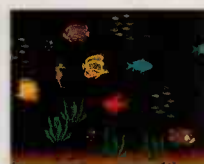
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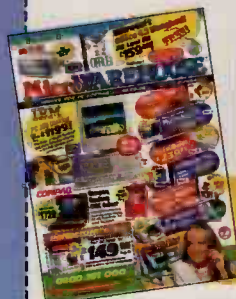
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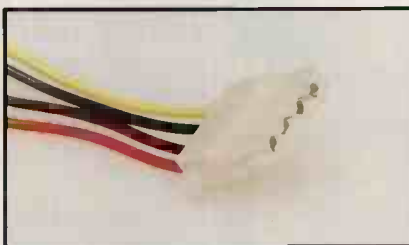
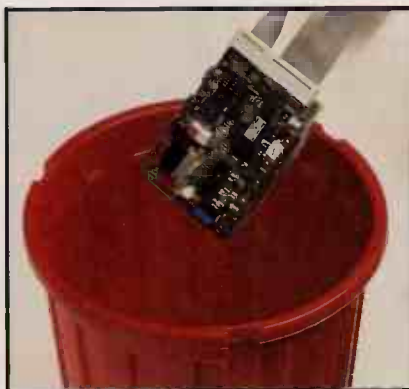
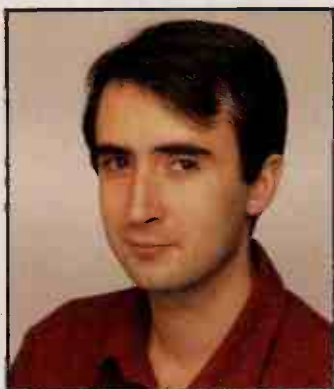
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# A HARD ACT TO FOLLOW



PCW Hardware Tour Photography by Bruce Mackie

**In last month's hard disk upgrading feature, Frank Leonhardt described how to select and fit a second hard drive. But what if you're saddled with a problem drive? You'll need some understanding of the underlying technology: interfaces, caches and disk formats. Here goes...**

Last month I described how to select and fit a second hard disk to a PC in step-by-step form. In most cases, following such a procedure should work. However, if you found yourself with one of the problem drives I described, or you want to tune your existing drives for the best performance, an understanding of the

underlying drive technology is necessary. Relax: I'm not about to dive into a discussion about voice-coil head positioning and the Bernoulli effect. What goes on behind the "Warranty Void if Removed" label is best left where it belongs. Interfaces, caches and disk formats are, on the other hand, out in the open and ripe

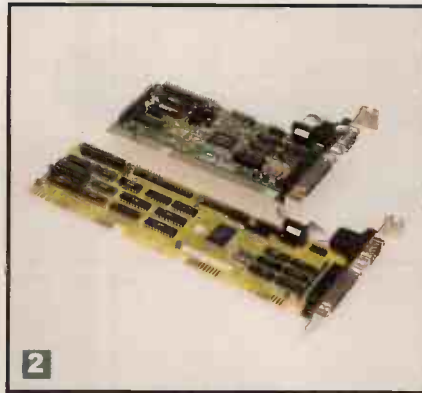
for tweaking.

To recap, there are three types of drive interface in common use: SCSI, IDE and obsolete. The obsolete interfaces include ST506 (sometimes referred to as MFM or RLL) and ESDI. ST506 was used on the original IBM AT and became the standard. It transferred data at up to 5Mbits/sec for the original MFM version and at 7.5Mbits/sec with RLL. ESDI was a standard developed for high-end drives which brought about a huge increase in capacity and quadrupled the data transfer speed. This was achieved by placing some parts of the controller on the drive itself so that data could be transferred to and from the computer in a more robust format. ESDI and ST506 controllers could support two drives at a time.

SCSI was ESDI's competitor for the high-end market. SCSI is a bus system that allowed several independent drive controllers to be connected at once. These drive controllers were intelligent so it was possible for the host computer's CPU to offload the hard work controlling the disk drives to them — a big advantage for a multitasking system. These days, SCSI controllers are embedded in the drives themselves.

In the end, the SCSI bus won the high-end market and the IDE standard displaced ST506 for the cost-conscious user. The big problem with ST506 was that the raw data was prone to corruption between the drive and the controller, and any attempt to increase the transfer speed led to errors or shorter interface cables. IDE did the same as SCSI and placed the controller on the drive itself, leading to the shortest possible data cable. The IDE drives then interfaced to the host computer using a bus; and what could be cheaper than using the existing





1. Most power supplies have extra connectors  
2. Two combined I/O cards. The larger one is VESA, the other is ISA 3. A kit for fitting a 3.5in disk into a 5in bay 4. Inside a typical PC

Because several devices can be connected to a computer bus, be it IDE or SCSI, each device must be given a call-sign or ID. This takes the form of a number and is set using switches or jumpers on the drive itself.

IDE allows only two drives on the bus: the first is the Master and the second is the Slave. This is where problems can start. Remember I said that an IDE drive looks like an ST506 controller to the PC? Plugging in a second drive means that, effectively, you have two controllers at the same address — disaster. To get around this, a Master IDE pretends to be an ST506 to the PC on behalf of both drives and the Slave remains silent. In order to do this, the Master has to communicate with the Slave. These Master/Slave conversations were not always as standard as they should have been, so two IDE drives of different types

ISA bus? Not only did this avoid the need for a costly SCSI-type host adaptor, but it meant the on-drive controller could be made to look like an old ST506, leaving the PC's BIOS none the wiser. Because the actual controller is placed on the drive, the card which fits into the PC is properly called an Bus Adaptor.

This is more or less where we are today. If you have an obsolete disk system it is probably better to replace it than attempt to upgrade it. If you have some large, fast ESDI drives you could consider supplementing them with a new SCSI system; but the cost of total replacement is unlikely to be great, especially when you consider the hassle factor.

### Configuration

There is a big difference between an interface and a bus. An interface allows the connection of one device to another and a bus allows several devices to talk to each other along one cable. This is analogous to the difference between telephones and radio. A telephone, once connected, allows you to converse with one person at the other end. By transmitting on a radio, however, you end up talking to everyone who is listening at the time. In order to make sensible use of radio, each user is allocated a call-sign so you always know who is talking to whom.

### The 528-Megabyte Limit

Whenever your computer's software wants to access a disk, it makes a call to a part of the BIOS known as INT13. To make an INT13 call, the programmer loads the track and sector number into the 16-bit CX register and the 8-bit head number into the DH register. In the old days, the BIOS would instruct the drive to move its heads to the appropriate place on the disk and then read or write using the selected head.

This still happens with standard IDE drives but SCSI units don't work this way. Instead, they are referenced using sequential Logical Block Numbers (LBNs). Using LBNs means the computer does not need to know how the disk is physically arranged, which makes designing disk systems easier — backwards compatibility issues apart.

In order to make SCSI drives work with a PC, an extension has to be added to the INT13 BIOS functions to convert the track/head/sector values into a logical block number suitable for the drive. This BIOS extension can either be loaded from an IDE hard disk before any of the SCSI drives can be accessed, or it can be present in EPROM on the SCSI adaptor. The latter solution is necessary if you want to boot from a SCSI hard disk and, as you might expect, such SCSI cards cost more than the standard ones.

If you take the highest possible track/head/sector values used by INT13 calls and multiply them together, you get a maximum block number of  $1024 \times 63 \times 255 = 16,450,560$  blocks. As each block is 512 bytes long, this gives the maximum capacity for a SCSI disk as 7.84Gb per disk ( $1\text{Gb} = 2^{30}$ ).

IDE drives, on the other hand, accept track/sector and head values and do all the translation internally. The old ST506 controller could only support drives with eight heads, though this was quickly increased to 16. This gives a maximum addressable capacity of  $1024 \times 63 \times 16 \times 512$ , or a miserly 516Mb! You may see this quoted as 528Mb, referring to the capacity in millions of bytes,  $10^6$ , rather than in binary megabytes of  $2^{20}$ .

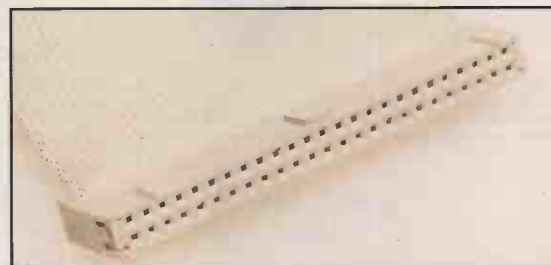
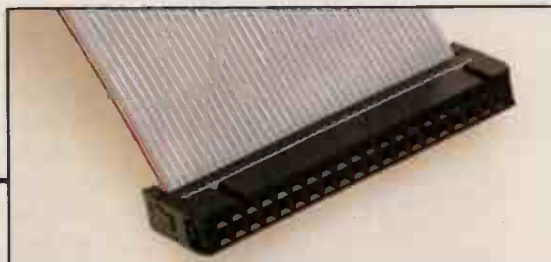
So, without changing the BIOS, IDE drives are stuck at 516kb. However, EIDE breaks the barrier by having an extended BIOS capable of handling 255 heads and translating all the parameters into an LBN. To take advantage of this you will need a machine with a suitable BIOS as well as a modern EIDE drive. As these become standard, SCSI will lose its lead in terms of capacity.

It is also possible to bypass the BIOS limitation on IDE drives using a utility like OnTrack's Disk Manager. This loads in from drive C: and gives access to further partitions for up to the full 8Gb per drive. The only snag is that disk managers may only work with MSDOS.



**Top** Note the red wire on the left

**Bottom** The bump in the middle is the key (see "Cables" panel)



sometimes failed to co-exist.

Since the bad old days of 1993, the drive manufacturers have got their act together and made all drives to the same ATA standard. But you might run into trouble if you try to keep your old IDE drive alongside a new one. If this happens, your only sensible option is to junk the old one. Sorry, but life can be cruel.

The Enhanced IDE standard (EIDE) can actually support four drives, but this is achieved by using two IDE buses. There was always provision in the IBM disk system for two ST506 controllers (i.e. four drives) but this was rarely supported by the BIOS and therefore hardly ever used. EIDE makes use of the hardware address allocated to the second controller and includes an updated BIOS to access it.

When adding more than two drives to an EIDE system you will need a second cable. The first drive on the second cable should be set up as a second Master because, for all practical purposes, the

two EIDE buses work in isolation.

The SCSI bus allows up to eight devices to be connected. As the host PC counts as one device this leaves space for seven drives, all of which need a unique ID. Once set, you should be able to plug a new drive in and go.

There are a number of other options that can be set on SCSI devices, parity being the most common. This refers to an extra bit of data sent with each byte as an error-checking measure. Some SCSI devices fail to send the parity bit while others fail to check it. If possible, set all the devices to use the parity bit, but if one

## Cables

The connectors on drives and ribbon cable can either be keyed or not keyed. If present, the key will be a notch or bump in the centre of one edge (see pictures). If both are keyed you can't go wrong; if one isn't then you have a 50 percent chance of getting it right.

If you do plug a drive in upside-down it is unlikely you will cause any damage.

However, if you want to avoid the trial and error you should match pin one on the adaptor with pin one on the drives. If you do this, the rest of the pins have to follow.

Looking closely at the circuit boards near the connectors, you should see a few numbers near the pins. The numbering starts at one end with pins one and two being opposite. For some strange reason, pin two is often chosen for numbering while pin one is not.

If you look at the grey ribbon cable you will see that one of the wires is red. Conventionally, this corresponds with pin one, so if you make sure the red stripe always goes to the low-number end of the connector you should be all right.

Drive cables must have something at either end. Conventionally this means that the computer is at one end and a drive is at the other, but this doesn't have to be the case. For example, you can have an IDE adaptor card in the middle of the cable with a drive at either end if it fits together better that way.

## Drive Mounting

I always mount my hard disks in a horizontal position. This is because, in the past, you had no choice. Although vertical mounting is claimed as a possibility for most units these days, and the gyroscopic effects probably create more stress than gravity can once they are spinning, I just can't bring myself to do it. Perhaps it's my imagination, but drives coming my way after spending a few months vertically all seem to have developed a squeak. The same is true of drives mounted horizontally but upside-down. The side of the mechanism with the circuitry on it should, with most drives, be underneath.



Most PC cases allow drives simply to be screwed in place, but some utilise mounting rails. These are screwed onto the side of the drive, which then slides and locks into the drive bay. Although this makes life easy for field service engineers, it can be a bit of a nuisance for the DIY enthusiast. Any good PC component dealer should be able to supply suitable rails but they are often ridiculously expensive for what they are, and, of course, you must remember to order them.

The other problem you might come across is a 3.5in drive unit and a 5.25in drive bay. Adaptors like the one shown above are available to get around this problem.

cannot handle parity it must be disabled on the others too.

Making the physical connection is only half the story. Once the lid has been screwed back down it is time to pay some attention to the software. Before a disk can be used by any operating system it must be partitioned and formatted. Partitioning breaks down a physical disk into logical disks, though it is possible to define the whole disk as one large partition — a common approach.

There are several good reasons for partitioning a disk into several small logical drives instead of one large one. The most obvious is security: if the PC goes wild and corrupts the file system on one logical partition, there is a very good chance that the others will remain intact. Reserving one partition for all your document files also makes finding the file you want easier and simplifies backing up.

What is not so obvious is the fact that smaller logical drives are more efficient. To understand this you must consider the way MSDOS stores its files. A drive is broken up into a number of logical chunks called clusters — 2kb long on a standard



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disk. In order to keep track of which files occupy which clusters, MSDOS uses a File Allocation Table (FAT), and on a hard disk this has space for around 65,000 entries. This would appear to limit the size of a disk to  $65,000 \times 2\text{kb} = 128\text{Mb}$ , because it is impossible for the FAT to be extended and still remain compatible with existing software. The only way to get around this was to increase the size of the clusters. As you can see from the table below, the larger the logical disk, the larger the cluster.

### Cluster Sizes

| Disk Size   | Cluster Size |
|-------------|--------------|
| 1Mb-127Mb   | 2kb          |
| 128Mb-255Mb | 4kb          |
| 256Kb-511Mb | 8kb          |
| 512Mb-1Gb   | 16kb         |

Why should a large cluster size bother you? Simply because whenever a file is created, its actual space on the disk must be rounded up to the nearest whole cluster. For example, on a 300Mb drive, a 1000-byte file will require 8192 bytes of the disk and a 10kb file will occupy 16kb. The smaller the cluster size, the less space is wasted.

This only applies to the FAT filing system. Operating systems like OS/2, Unix and Windows NT offer alternatives to FAT which don't suffer from this problem; but if you are using DOS/Windows, or want your data held in an industry-standard format, then splitting big disks down can make a lot of sense.

In order to partition a disk you need to run the FDISK utility. There are versions of this supplied with DOS and OS/2, the latter being considerably more flexible. Special versions for FDISK are necessary with some SCSI adaptors.

When partitioning using DOS you must have a Primary DOS Partition somewhere on your first hard disk, which becomes drive C:. OS/2 allows more than one primary partition, but only one at a time is visible. The rest of the disk can be broken down into any number of extended partitions which become drive D:, E: and so on.

At the start of the first hard disk resides the Master Boot Record (MBR). This shows where the Primary and first Extended partition are on the disk. The Primary partition starts off with the MSDOS boot record and the Extended partition begins with another MBR. This Extended partition MBR refers to itself as though it were the Primary partition and points forward again to the next Extended

*Little and large. The bulky Maxtor 380Mb hard disk was state of the art in its day, but the smaller 3.5in disk on the right has a higher capacity — 500Mb*

partition. Thus, all the extended partitions are linked together across the disk. This is why messing about with the partitioning can break the chain and cause all your logical disks to disappear.

When you have two disks installed DOS assumes that the second drive starts with an

Extended partition, however it was originally defined, and just adds it to the chain. This allows you to freely interchange first and second drives without the need to repartition them.

One odd effect of partitioning a second drive is that it will sometimes run slower than if it were installed as the first drive. I thought this was simply folklore until it happened to me. The solution is to install it as the only drive on the system, partition and format it, and then turn it back into the second drive.

Some very cheap IDE adaptors, which are incapable of adjusting their transfer rates to suit individual drives, are forced to slow down to match the slowest drive



on the cable. If this happens to you, the best solution is to buy a better adaptor at a cost of around £20.

Further speed enhancements can be made by judicious tweaking of BIOS parameters to pre-read data on a speculative basis (sometimes called block pre-read mode). This is before you start to consider hardware and software disk cache systems. As drive interfaces become more standard, operating systems like OS/2 Warp and Windows 95 are taking advantage by featuring optimised drivers and cache systems. One thing is certain — hard disks will continue to get faster, larger and cheaper in the foreseeable future. **PCW**

### Faster IDE

**P**rice and compatibility are IDE's traditional advantages over SCSI. Using SCSI instead of IDE will set you back around £150 for the adaptor card alone. Add to this the need for special drives to use with each operating system and you begin to wonder if SCSI is worth it.

There are a few good reasons for choosing SCSI. First, you can have drives up to 8Gb with no problem. You can also run seven devices, including CD-ROMs and tape drives, off the same adaptor while IDE only gives you two. Add to that the fact that SCSI systems are potentially much faster and you begin to feel that the cost may well be worth it.

However, IDE is fighting back. The Enhanced IDE standard, proposed by Western Digital and now widely adopted, supports up to four devices and 8Gb drive sizes. A five-fold improvement has also been made in data transfer speed.

Original IDE and ST506 drives used a system called Blind PIO to send data. The drive always accepted data at 5Mb/sec, and as this was the maximum the ISA bus could manage there was no problem. With the advent of local bus the PC could start running faster, but with IDE the data rate had to be kept low in order to avoid overloading the drive. With EIDE a synchronised PIO transfer (Type 3) is possible where the drive can control the incoming data rate using a line called IOREADY. By letting the drives run at their maximum rate, speeds of 11Mb/sec are already being realised using PCI or VESA local bus adaptors, and 20Mb/sec is on the horizon.

PIO transfers require data to be moved around by the processor rather than the controller card. This wastes processor time on multitasking systems but matters little to the DOS/Windows user. High-end SCSI cards could use Direct Memory Access (DMA) to transfer data to and from RAM without processor intervention on EISA and PCI bus machines — great for multitasking servers. Now a new DMA mode has been added to EIDE which allows it to do the same tricks. This currently operates at 13Mb/sec and will soon be even faster.



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# Group Test

# Vision on

**The arrival of video capture cards means that anyone with a PC can add video clips to a document or presentation, or even create an entire video from scratch. Donning his director's cap, Karl Dunkerley looked at 13 current models, costing between £200 and £1,100, and made some exciting discoveries.**

**M**ost households now own a VCR, and ownership of camcorders and multimedia PCs and Macs is rising rapidly, so many people now possess the raw materials needed for video editing and playback.

Starting at the bottom, Windows 3.1 comes equipped with Media Player, which allows users to play pre-compiled clips from hard disk and CD-ROM. Beyond this, cheap digitising cards with Video for Windows drivers are available for a couple of hundred pounds. These only allow capture at limited rates and in small windows, but for many multimedia applications that's enough.

Moving up a peg, cards with some hardware assistance and better editing tools are available for less than £500. These allow bigger windows, better playback quality and the ability to string clips together with professional transitions between one scene and the next. Until recently, only Adobe Premiere was readily available in the UK. Now, new editing tools are hitting the market, spurring on innovation and driving prices down.

Still within the consumer market but aimed more at the enthusiast than the occasional user, one or two cards allow

full-screen, full-motion, full-colour capture of video images. Using hardware-based M-JPEG compression, realtime capture can be controlled to allow for the trade-off between image quality and the ability of the PC to compress, transfer and store the data stream to hard disk.

In this round-up of capture cards, we've picked a baker's dozen ranging from the budget level to the serious enthusiast level but stopping short of professional cards. Some cards have been around for some time, others represent the new wave. The latter are gearing up for Plug and Play, Windows 95 and the adoption of large, cheap hard disks on PCs with fast processors and a PCI bus.

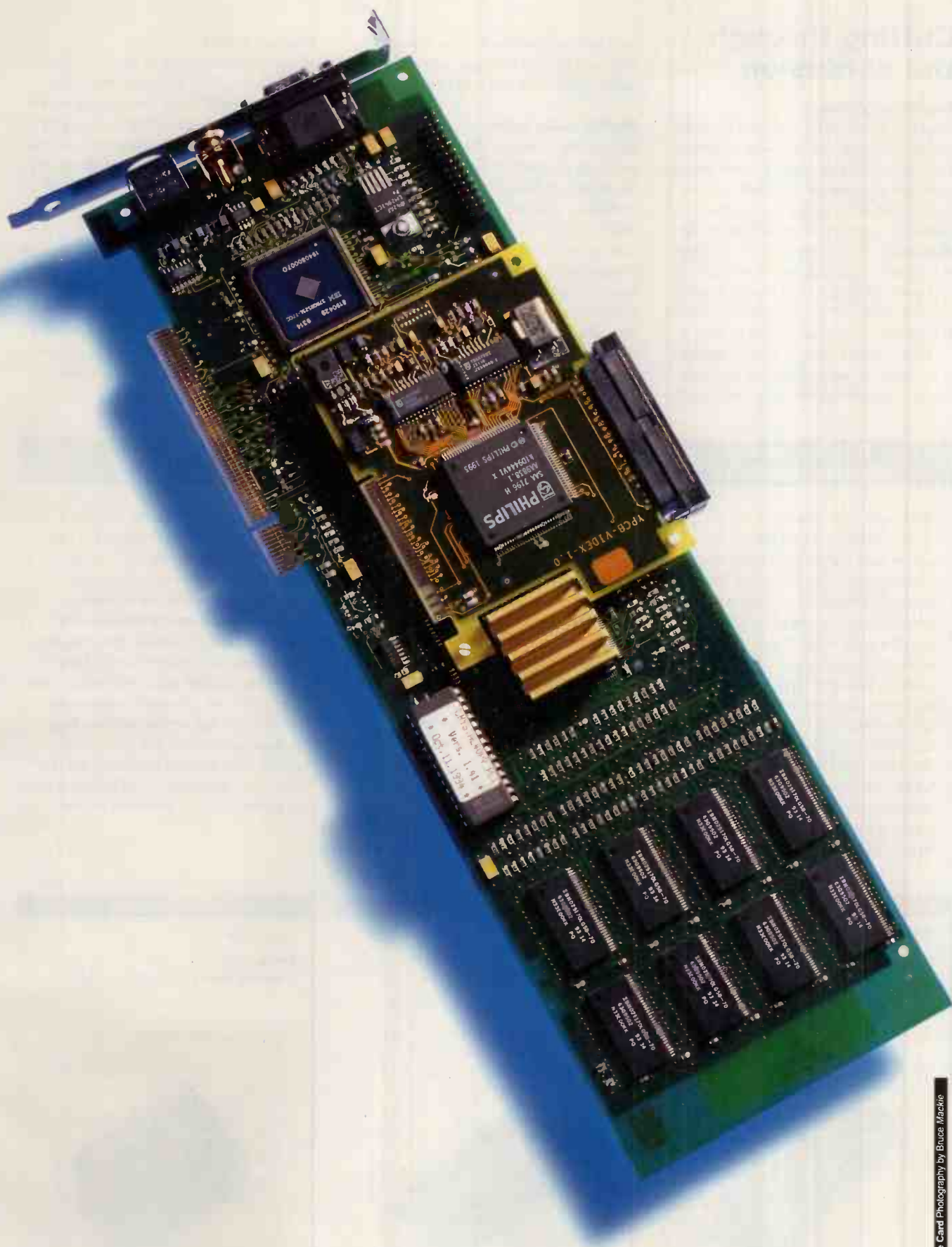
For users, the good news is that the day of the large, slow, capture card covered in jumpers and bundled with unfriendly installation software is coming to an end. Furthermore, the number of cards available is increasing monthly as a result of increased demand and competition.

Just as pioneers of easy-to-use DTP tools such as Aldus PageMaker and Quark XPress gave individuals the power to print, the new video tools are giving people the power to produce.

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Video Capture Card Photography by Bruce Mackie



## Cutting through the confusion

### DeskTop Video

DeskTop Video or DTV loosely describes any system where a computer is used in the video editing process. A more precise definition involves what happens to the final output. An analogy can be drawn between DeskTop Video and DeskTop Publishing. In DTP, most of the material is roughed out on paper first and then fed into the DTP program for layout, correction and editing. The compiled document is then printed out onto paper or film.

Similarly with DTV. The raw footage is captured on tape, edited using either linear or non-linear methods (see oppo-

site) and put back onto tape. For both DTP and DTV output, you don't need a computer to view the final results.

### Multimedia video

Multimedia video, on the other hand, employs precisely the same techniques to create it but the end results stay in a computer. A video movie, in this case, will then become part of a computer file and be called up from a document or presentation. For instance, a sequence may be embedded in a document, played back from a presentation graphics package or become part of a game. The video only exists within the computer and is stored on hard disk or CD-ROM.

### Digital video

Many people mistakenly refer to video editing using PCs as digital video. It is not. True digital video involves the whole process of capture, editing and playing back footage. Video cameras and VCRs are currently nearly all analogue: signals are stored in waveform rather than as discrete signals.

New professional cameras from Sony and others capture the footage directly as digital data stored on digital tape or some form of RAM storage, and the footage can then be downloaded to a computerised video editing deck without further conversion. After editing, it is put back to digital media and broadcast in digital form to digital screens.

### 928Movie & Captivator Pro

This add-on to VideoLogic's flagship VESA graphics card turns it into a capture card, but not a top-class one. Installation was straightforward, although the new 928Movie setup disks in the Captivator Pro box are essential. Despite using the Vesa Media Channel (VMC) technology, a high-speed link which bypasses the normal bus, the transfer capabilities are under-used. The best combination is 160 x 120 at 25fps which is disappointing. To be fair, though, VideoLogic does position the Captivator Pro as a full-screen still-capture device with video capture capabilities added on. Extra RAM and audio facilities can be added to the graphics board.

#### PCW Details

##### 928Movie and Captivator Pro

**Price** 1Mb/no audio £229; audio +£70; 1-2Mb upgrade £79

**Contact** VideoLogic 01923 260511



### Aviator

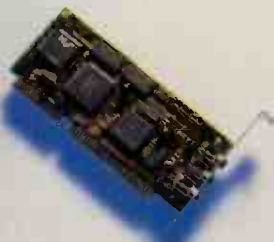
A small board with just one set of jumpers, installation is easy provided you do everything in the specified order. First you install Video for Windows, then the Aviator installation software. Finally, you use the Drivers applet in Control Panel to test the board and the installation thoroughly — do it wrong and the drivers won't work. It will capture 640 x 480 but dropout is appalling, especially the first few seconds. 240 x 480 at 15fps came out best. The one let-down is that there is no S-Video input. Aviator has clearly been overtaken by rivals and needs updating.

#### PCW Details

##### Aviator

**Price** With Adobe Premiere £279

**Contact** FAST Electronics (UK) 0171 221 8024



### Captivator

A small, neat board with only four jumpers for the I/O address. It can handle both composite and S-Video signals. Installation could have been smoother but at least the software automatically scans for free resources before you put the card in. The manual is very good. Coming with the full Video for Windows package plus the clips and samples CD-ROM, it is usable immediately without complex editing software. As a budget capture device, it managed a respectable best combination of 20fps at 240 x 180. Definitely one of the better cards at the lower-priced end of the market.

#### PCW Details

##### Captivator

**Price** £199

**Contact** VideoLogic 01923 260511





Until digital broadcast becomes a reality the process will remain incomplete, but it does promise extremely high quality images, faster editing and greater creativity.

### Linear editing

This refers to old-fashioned editing techniques, which relied upon control of tape players. A central control panel moved tape back and forth to the desired points, hence the term "linear". One scene changes to the next using the transitions available through a mixing desk. The video signals remain on tape.

### Non-linear editing

Computers have shaken up the world of

linear editing thanks to sophisticated control systems, cheap mass storage and high-speed processors. The original footage is converted from analogue to digital form and stored on hard disk. This can then be accessed more or less at random, hence the term "non-linear".

In digital form, special effects and clever transitions from one scene to the next are easier to achieve. Advanced techniques such as morphing and warping have now reach the consumer's desktop thanks to the popularity of non-linear editing systems.

## Video Editing Tools

As the quality of boards improves, so does the quality of the editing tools bundled with them. Buying software along with the card does make economic sense. Adobe Premiere can add as little as £80 to the price of a board. Normally it retails at over £200. Some cards do not come with software and the reference on the box to Video for Windows may mean only the playback and capture drivers. Only with the full package do you receive the editing tools. Four different packages were bundled if you discount the FAST Movie Studio which does not handle captured images.

### Intel Smart Video Recorder Pro

The original ISVR was difficult to set up and the real capture rate low with many frames dropped. The new Pro board is quite different. There are no jumpers and the IRQs and I/O are set in software. It even has its own uninstaller and the slim manual is very good. Capture and dropout rates have improved but are still not perfect. The best combination was 240 x 180 at 20fps. Below these rates no dropout occurred. This makes it an excellent package with the bundled tools for embedding small multimedia clips. Full marks to Intel.

#### PCW Details

##### Intel Smart Video

Price £449

Contact Intel 01793 696000



### miro 20TD Live

Of the miro range, this is the one most likely to appeal to a wide audience. The ET4000W32p chip is the latest in AVI acceleration and the board has live digital TV overlay capability, giving far better quality than analogue. Easy installation is aided by the lack of jumpers. Playback is scalable to 800 x 600 and capture uses M-JPEG drivers. The miroVideo Codec XL1 uses the high-quality YUV 4:2:2 format, which Microsoft has adopted for Windows 95. The 20TD Live includes the DCI technology of Win95, allowing the video software to access the video hardware directly. This greatly speeds up image refreshing. Capture at 320 x 240 and 25fps is flawless.

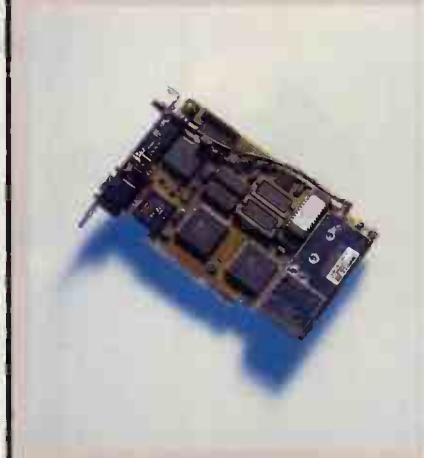


#### PCW Details

##### miro 20TD Live

Price PCI/VL-Bus 1Mb £325; 2Mb £375

Contact Miro 01494 510250



### miro 40PV

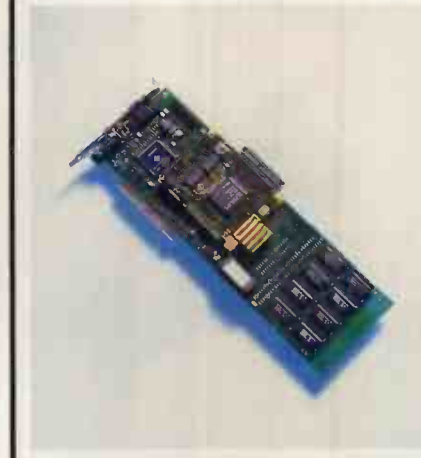
The 40PV is one of the new wave of multifunction graphics cards. Using the Weitek VideoPower 9130 chip, it can display digital video clips in realtime. These are scalable to 1600 x 1200 without jerkiness or frame loss. The board can also be used alongside the DC1TV to provide a high-quality digital overlay when capturing video. Together, editing is much faster as screen redraw is accelerated thanks to the 4Mb video RAM. On its own, the capture rate is most respectable at 25fps and 320 x 240 though it will go to 704 x 528 (not quite PAL). If you want a single graphics board with reasonable video capture then this could be the board for you. One for developers thanks to the high price.

#### PCW Details

##### miro 40PV

Price £1099

Contact Miro 01494 510250





**Microsoft Video for Windows 1.1**

This is the most basic of the packages but is nonetheless a useful tool for the multimedia video compiler. No-one in their right mind would try to use it for full PAL editing — chances are it would fall over or take a very long time.

VidEdit is the heart of VfW and uses a VCR-like interface. It lets you bring in clips, crop them, string them together and insert one into the middle of another. There is no titling or no transitional effects but you can bring in clips of different sizes and frame rates and have them converted to the same format in synchronisation. The package also comes with VidCap, Media Browser and applets to manipulate image, palette and wave files.

VfW1.1d is the latest version with elements of Windows 95 and is the one to ask for when buying a capture card. Ask also if there is a CD-ROM of clips included. For quick and simple editing of multimedia video, it's all you need.

**Digital Video Producer OEM 3.0**

DVP from Asymetrix is a notch above VfW. It has an interface closer to Adobe Premiere but lacks the latter's high-end functionality. The VCR analogy is used again but this time there are two video players. To play a clip you load it into the Media Window and drag and drop it onto one of the players. A simple but effective titler is included and there are plenty of transitions, though nothing too fancy.

Filters can be added to a sequence. Its best feature is the Compression option, which allows you to preview the effect of changing CoDec and compression characteristics. Quickly and easily, you can decide the level of quality you are happy with. It's a shame other packages do not include this simple but effective feature.

Asymetrix is due to launch a standalone DVP soon (the current one is OEM only) with many enhancements. Though not aimed at the sophisticated video user, it is ideal for multimedia video.

**U-Lead Video Studio 2.0**

A distinct improvement over version 1.0, the latest U-Lead Video Studio shows a

**miro DC1TV**

After its predecessor failed to live up to its promise, miro quickly brought out the much improved DC1TV. Video signals can be brought in, edited and output back to tape using either composite or S-Video. JPEG compression means that captured files are small and the quality level can be controlled from software. No jumpers and a sophisticated installation and hardware checking routine should have made setting up a breeze. Sadly, the need for memory exclusions and changes to the BIOS settings spoils this. The best rate of capture is at 320 x 240 and 25fps but it will capture half-PAL or 384 x 288 which can be scaled up to full with Adobe Premiere, if needed.

**Movie Machine Pro**

Fundamentally different from the other boards, this is primarily a TV tuner and live video mixing board. It lacks S-Video but has two composite in and one composite out. Despite the manual, installation was smooth, although the full-length board and tuner box may not fit some machines easily. The MovieTV software allows you to watch TV and the MovieStudio acts as a live mixer and effects generator, and also supports true PAL resolutions. To capture you need something like VfW or Premiere but sadly, the effective frame rate is poor at all rates and screen sizes. For anyone mixing tapes, though, it is excellent.

**Movie Machine Pro & M-JPEG Add-on**

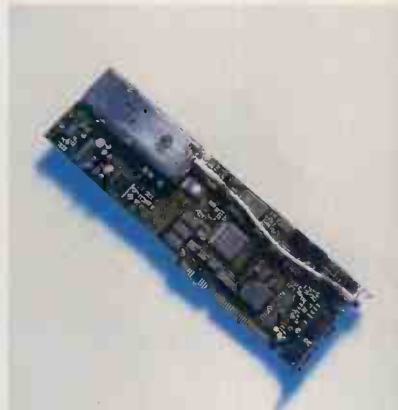
This is FAST's turbocharger. It takes the MMPro board and turns it from a sub-standard capture device into a power machine. Even at the full PAL resolution of 768 x 576 and 25fps, dropout is virtually non-existent. This proves the superiority of hardware compression over software and file sizes are minimal. The M-JPEG makes the MMPro into a crossover device. You can use it to capture for multimedia embedding or edit Full-Motion Video for output back to tape. The supporting software is excellent and there's even the option of a software-based M-JPEG to MPEG convertor. One hint — if upgrading from MMPro to M-JPEG, remove your old installation first.

**PCW Details****miro DC1TV**

**Price** £450 with U-Lead Video Studio; £599 with Adobe Premiere  
**Contact** Miro 01494 510250

**PCW Details****Movie Machine Pro**

**Price** £495  
**Contact** FAST Electronics (UK)  
0171 221 8024

**PCW Details****Movie Machine Pro & M-JPEG Add-on**

**Price** M-JPEG £319; with Adobe Premiere £399, Xing MPEG convertor and Animator Pro £450  
**Contact** FAST Electronics (UK)  
0171 221 8024





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| 2Mb x 32, 70ns (8Mb module) | 219.80 |

### Graphics Cards

|                         |        |        |
|-------------------------|--------|--------|
| Diamond Stealth 64D 1Mb | PCI    | 96.00  |
| Diamond Stealth 64D 2Mb | VL/PCI | 149.90 |
| Diamond Stealth 64V 2Mb | VL/PCI | 247.40 |

These are a small selection of the components available. Please call for full details.

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# RTM

## Systems



rapid coming of age. The interface looks professional although a proper preview window would help. In terms of finding features from the menu list, VS2.0 does make things harder than they need to be: features need to be made more obvious. The titling and overlay facilities are excellent and anyone making corporate presentation clips would find these facilities better than Premiere's. An image editor allows the user to add filters and text and modify an individual image or sequence, though this is laborious. A package for impressing the clients.

### Adobe Premiere 1.1

This is the grand-daddy of the DTV editing world but its progress on the PC



● *Digital Video Producer tries to look like a traditional editing suite*

### PCIMovie and Captivator Pro

The same add-on as for the 928Movie board, this adds capture capability to the PCI-based version of the Movie graphics card. Installation was similarly easy but the dropout was higher. The explanation is that the PCI version captures in YUV 4:2:2 format which is higher quality than the 928's 4:1:1. The best combination drops significantly to 160 x 120 at 15fps. Fortunately, both Movie boards have the SuperScale and SuperSmooth technologies which allow small clips to be replayed in any size of window with little loss of quality. VideoLogic needs to bring out a high-powered version if it's truly going to demonstrate the value of VMC.

#### PCW Details

##### PCI Movie and Captivator Pro

Price £249

Contact VideoLogic 01923 260511



### VideoBlaster RT300

After the SE100, this was a pleasant change. An altogether better card, installation through Windows was clean although it did have jumpers for IRQ and I/O. The manual is also clear. With three composite inputs and one S-Video there should be enough for most people's needs. Using Intel's latest i750 chip, the effective capture rate is also significantly higher than its little brother. It will capture 240 x 180 at 25fps with little dropout, although be warned — it doesn't pick up the first five seconds when dropout is highest. It can also be used as part of Creative Labs' new videophone system.

#### PCW Details

##### VideoBlaster RT300

Price £240

Contact Creative Labs 01734 344322



### VideoBlaster SE100

Replacing the VideoSpigot, the SE100 is Creative Labs' budget video capture device. Sadly, the company has not put as much thought into the installation routine as into the software bundle. The board failed to recognise IRQ 11 even though it was free. The fact that many important instructions are in readme.txt files implies a rush to market. Capture and dropout rates are unimpressive and playback lossy — 15fps at 160 x 120 gives the best results. Too many jumpers, an awkward installation routine and having to make changes to account for the amount of RAM mean that this is not a beginner's board.

#### PCW Details

##### VideoBlaster

Price £170

Contact Creative Labs 01734 344322





has always been way behind that of the Mac. The long-awaited version 4.0 for Windows should bring it up to the same level on both platforms but devotees wait with baited breath.

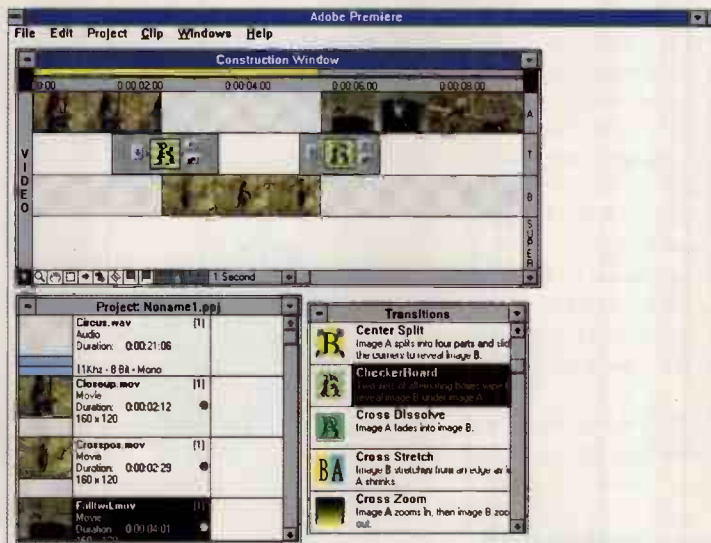
Premiere gives the editor a complete workspace that can be tailored to an individual's needs. Preview, Info, Project, Transition and Construction windows can be moved and resized, and the drag and drop nature of the interface helps enormously.

Despite the impression given by the manual, Premiere will edit frame sizes greater than 320 x 240 if you have the drivers and a matching board (the 320 x 240 refers to use with software-only CoDecs). You can see the effect of

different CoDecs on output quality.

With a host of transitions, filters and the ability to output a FilmStrip to Photoshop where each frame can be modified whole

or in part, Premiere already has enough features to satisfy most people. Version 4.0 will help Adobe maintain its lead in the DTV field.



● Providing a complete editing workspace, Premiere has plenty of professional features

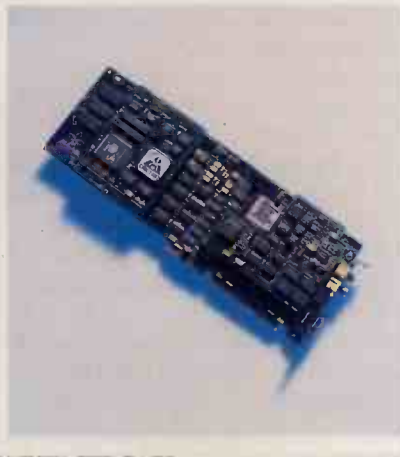
## Videola Premium

A strange system, this: one full-length board with two clipped-on daughterboards and a subcard to allow S-Video input and output. Installing the hardware is a test of manual dexterity. With M-JPEG for high-quality capture and SuperZoom for rescaling accelerated AVI playback, some excellent results can be achieved. As with other scalable cards, the idea is to capture small and scale up when playing back. Using a low compression ratio (but higher quality picture), the ability to capture at 320 x 240 with only around seven percent dropout was acceptable. At 240 x 180 it was even better, with upscaling still acceptable.

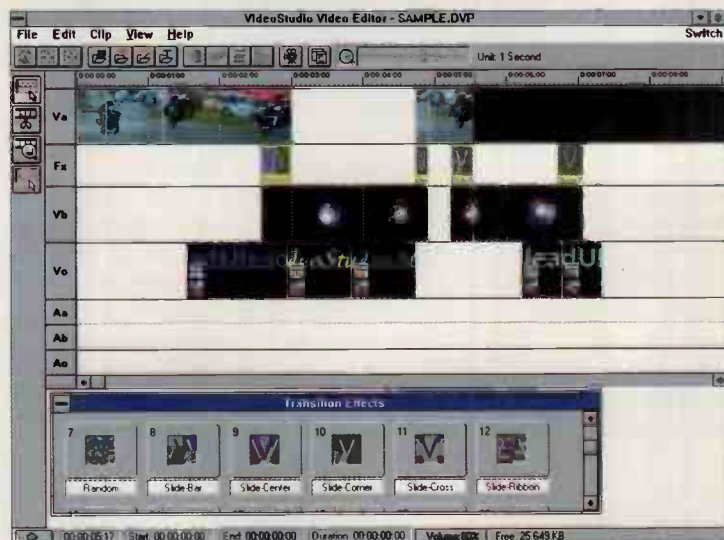
## PCW Details

### Videola Premium

Price Premium £629; Pro (no M-JPEG compression) £529  
Contact Orchid Europe 01256 479898



● Video for Windows is a basic cut-and-splice tool yet includes the ability to see the effects of different CoDecs on picture quality



● U-Lead's Video Studio 2.0 tries — and almost succeeds — to compete with Premiere



## Glossary

**Analogue Video** — Traditional television and video pictures where signals are in waveform. They are stored as part of a continuous stream of information rather than discrete items. Just as analogue vinyl gave way to digital CD in music, so analogue video is beginning to give way to digital video. See "Digital Video".

**Address** — Where a piece of memory can be found. Clashes occur when two boards try to access the same address, a bugbear of earlier video capture cards due to their complexity and limited flexibility.

**AVI (Audio Video Interleave)** — Adopted by Microsoft as part of its Video for Windows system. Allows sound and vision to be stored in one file, making lip-synching more accurate.

**Chrominance** — Signal representing the colour element of an image. A black (or white) image has a chrominance value of zero.

**CoDec (Compression/Decompression)** — Software or hardware that takes raw data and removes unnecessary information before storage and then fills in the gaps upon playback. Smaller files are created and stored.

**Colour Depth** — The number of bits used to represent an individual pixel's colour. Similar to graphics cards, common formats include 8-bit (256 colours), 16-bit (64K colours) and 24-bit (16 million colours plus, also called TrueColour).

**Colour Palette** — The total number of colours a system can generate even though a lesser number may only be displayed simultaneously. For instance, 256 colours may be displayed simultaneously from a palette of 64K colours. This can lead to temporary colour shifts if more than one image is displayed on screen.

**Composite Video** — Where all the information concerning the picture, such as colour and luminance, is contained in one signal instead of being split. Used with VHS and Video 8 signals.

**Data Rate** — The amount of information that can be written to or read from a storage medium or transferred across a system as expressed in kilobytes per second (kb/sec).

**Desktop Video** — The ability to edit video clips using the computer rather than a traditional editing suite.

**Digital Video** — Where each part of a picture is stored as a discrete bit of information with a precise value. See "Analogue Video".

**Digitise** — The conversion of an analogue

signal to digital.

**Driver** — Software allowing the operating system and hardware of the computer to talk to additional hardware.

**Frame Buffer** — An area of storage used to hold an image before being displayed.

**Full-Motion Video** — The capture and playback of video at full resolution, speed and colour (768 x 576 @ 25fps and 16.7 million colours for PAL).



**Hardware CoDec** — Special hardware used to encode raw video data for storage to disk. Faster than software, it also achieves higher compression rates and better quality. However, the hardware is also required for playback thus limiting its use for distributing footage. See "Software CoDec".

**Hi 8** — An improved version of Video 8.

**Interlaced** — An image refreshed in two passes. On one pass all the odd lines are refreshed, the even lines are refreshed on the next pass. See "Non-Interlaced".

**JPEG (Joint Photographic Expert Group)** — A specific standard for compressing a still image and decompressing it with a user-determined degree of quality and image lossiness. See "M-JPEG" and "MPEG".

**Luminance** — The brightness value of a point in an image.

**Motion JPEG/or M-JPEG** — Where the JPEG compression system has been applied to a sequence of images or frames in a video clip. Each is encoded separately. See JPEG and MPEG.

**MPEG (Motion Pictures Experts Group)** — At a simple level, a Key Frame is chosen every so many frames and compressed fully before storage. Only the differences between it and subsequent frames are stored. In truth, the mathematics are much more complex but the high compression has made MPEG popular for Video on CD. Compression rates are very high and files small but playback is lower quality. See JPEG and M-JPEG.

**Non-Interlaced** — When a screen image is refreshed completely in one pass. See "Interlaced".

**NTSC (National Television System**

**Committee)** — The American 525-line television picture. Nicknamed "Never Twice the Same Colour" by European television engineers due to its lack of colour stability. See "PAL".

**Overlay** — Displaying a video signal over the normal VGA screen. Can be digital (better) or analogue (worse).

**PAL Phase Alternation Line** — The European 625-line television system picture. The French use the SECAM variation. See "NTSC".

**RGB (Red/Green/Blue)** — The colour creation system used by computer monitors to portray particular colours in the spectrum. Each pixel consists of a red, green and blue dot. The relative strength of each produces the colour additively.

**Scaling** — Using software or hardware to change the size of an image. Certain boards can take small images and blow them up to any size and shape.

**Software CoDec** — This form of image compression and decompression can be carried out on any computer system without extra hardware. Performance depends on the make-up of that system. For better quality or a larger picture you need a faster processor, disk and bus.

**S-VHS (Super Video Home System)** — A higher quality of video tape and encoding system than the common VHS format. It can handle around 400 picture lines. See "VHS".

**S-Video** — A higher quality signalling system than Composite. The video signal is split into brightness (luminance) and colour information (chrominance) which are transmitted separately. Used for S-Video and Hi 8 signals. See "Y/C".

**VHS (Video Home System)** — The most common video tape format capable of recording around 240 lines in composite format.

**Video 8** — Video cassette using an 8mm tape. Generally restricted to Sony camcorder equipment. Little used in consumer market but better quality than VHS.

**Video Decoder** — This converts an analogue video signal into a digital one. See "Video Encoder".

**Video Encoder** — The opposite of the video decoder as it converts a digital video signal to an analogue one. See "Video Decoder".

**Y/C** — A two-component video signal. Y=luminance or brightness and C=colour data.

**YUV** — A video signal where Y carries the brightness information and U and V the colour data.



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VIDEO CAPTURE CARDS TABLE OF FEATURES

● = Yes  
○ = No

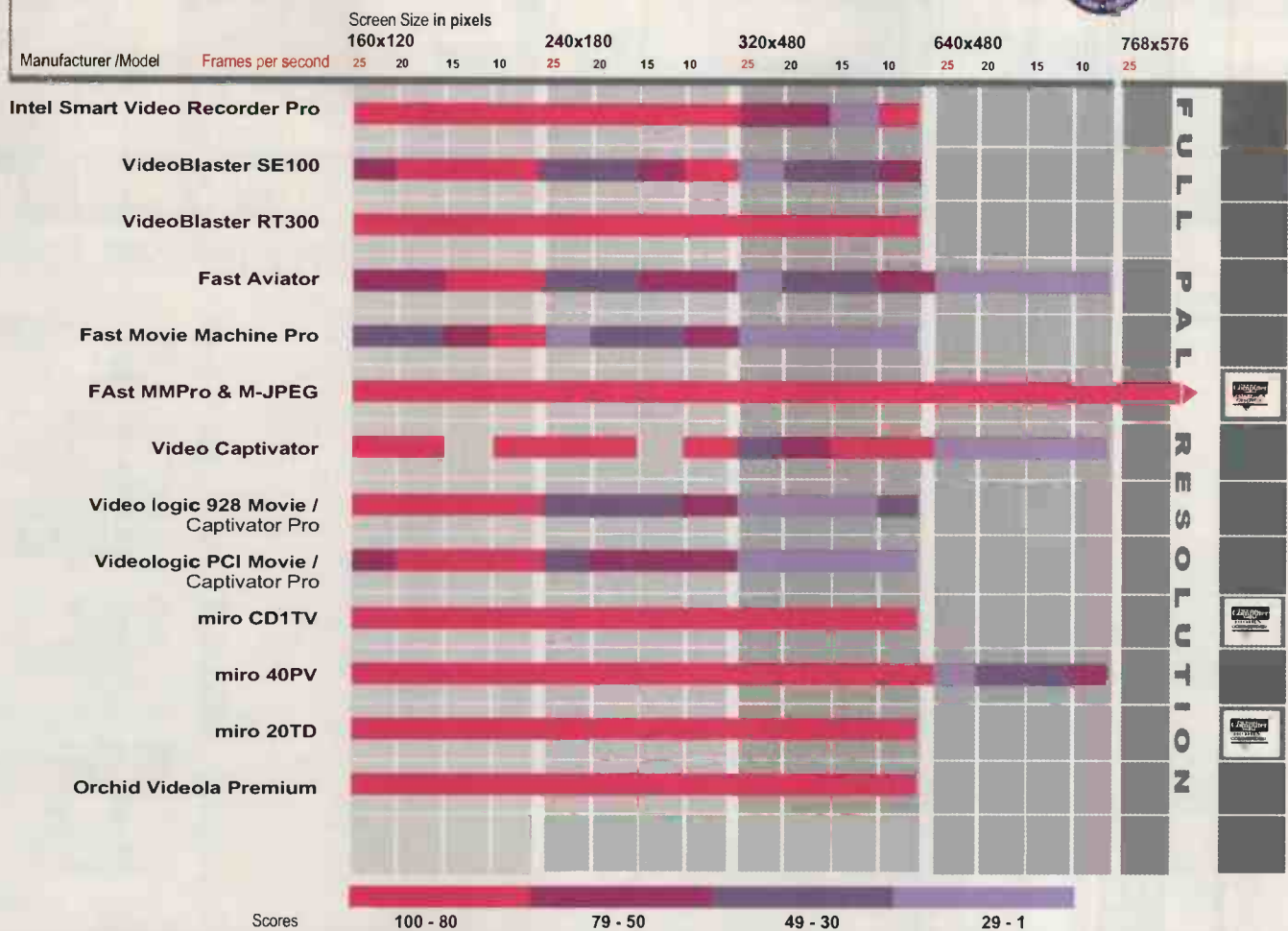
|                        | Intel                    | Fast                     | Fast                                       | Fast                     | Videologic                | Videologic                 | Videologic                |
|------------------------|--------------------------|--------------------------|--|--------------------------|---------------------------|----------------------------|---------------------------|
| Manufacturer           | Intel                    | FAST                     | FAST                                       | FAST                     | Videologic                | Videologic                 | Videologic                |
| Model Name             | Smart Video Recorder Pro | Movie Machine Pro        | MMPPro & M-JPEG add-on                     | Aviator                  | Captivator                | 928 Movie & Captivator Pro | PCI Movie & Capt'or ProTV |
| Phone No.              | 01793 696000             | 0171 221 8024            | 0171 221 8024                              | 0171 221 8024            | 01923 260511              | 01923 260511               | 01923 260511              |
| Fax No.                | 01793 641440             | 0171 792 3449            | 0171 792 3449                              | 0171 792 3449            | 01923 270188              | 01923 270188               | 01923 270188              |
| Price Reviewed         | £449                     | £495                     | £319                                       | £199                     | £199                      | £199                       | £249                      |
| Specification          |                          |                          |  |                          |                           |                            |                           |
| Buses                  | ISA                      | ISA                      | ISA  | ISA                      | ISA                       | ISA                        | ISA                       |
| Feature Connector      | ○                        | ● / Used                 | ○  | ○                        | ○                         | ○                          | ○                         |
| Pass Through VGA       | ○                        | ●                        | ○  | ○                        | ○                         | ○                          | ○                         |
| Inputs Available       | 1 x Composite            | 2 x Composite            | ○  | 3 x Composite            | 1 x Composite             | 1 x Composite              | 1 x (Composite            |
|                        | 1 x S-Video              | 1 x TV Tuner             |  |                          | 1 x S-Video               | 1 x S-Video                | S-Video & RF)             |
| Outputs Available      | ○                        | 1 x Composite            | ○  | ○                        | ○                         | ○                          | ○                         |
| Add-on card ? Y / N    | ○                        | ○                        | ● - MMPPro                                 | ○                        | ○                         | ●                          | ●                         |
| Software Bundle        |                          |                          |  |                          |                           |                            |                           |
| In Price               | DVP 3.0<br>DigiClips CD  | MovieTV &<br>MovieStudio |  |                          | Video for<br>Windows 1.1d | Video for<br>Windows 1.1d  | Video for<br>Windows 1.1d |
| Options                |                          |                          | £450 Xing CD,<br>Animator Pro,<br>Premiere | £279 - Adobe<br>Premiere | Action 2.5                |                            |                           |
| CoDecs Included        |                          |                          |  |                          |                           |                            |                           |
| Hardware               |                          | YUV 4:1:1                | YUV 4:1:1                                  | YUV 4:1:1                | YUV 4:1:1                 |                            |                           |
| Software               | Indeo v3.2               | VfW 1.1d                 | VfW 1.1d                                   | VfW 1.1d                 | VfW 1.1d                  | VfW 1.1d                   | VfW 1.1d                  |
| Additional Information |                          | S-Video<br>version soon  |  |                          |                           | Links to any<br>VMC card   | Links to any<br>VMC card  |

## CONTINUED

|                        | Creative Labs      | Creative Labs             | miro                       | miro                       | miro                                   | Orchid             |
|------------------------|--------------------|---------------------------|----------------------------|----------------------------|--|--------------------|
| Manufacturer           | Creative Labs      | Creative Labs             | miro                       | miro                       | miro                                   | Orchid             |
| Model Name             | VideoBlaster SE100 | VideoBlaster SE100        | miroVideo 20TD Live        | miroCrystal 40PV           | DC1TV                                  | Videola Premium    |
| Phone No.              | 01734 344322       | 01734 344322              | 01494 510250               | 01494 510250               | 01494 510250                           | 01256 479898       |
| Fax No.                | 01734 320300       | 01734 320300              | 01494 510070               | 01494 510070               | 01494 510070                           | 01256 64222        |
| Price Reviewed         | £199               | £299                      | 1Mb £295                   | £1099                      | £450                                   | £629               |
| Specification          |                    |                           |                            |                            |  |                    |
| Buses                  | ISA                | ISA                       | PCI/VESA                   | PCI                        | ISA                                    | ISA                |
| Feature Connector      | ● / Used           | ●                         | ● / Not Used               | ● / Not Used               | ● / Not Used                           | ● / Used           |
| Pass Through VGA       | ● / Used           | ●                         | ○                          | ○                          | ○                                      | ● / Used           |
| Inputs Available       | 2 x Composite      | 3 x Composite             | 1 x Composite              | 1 x Composite              | 1 x Composite                          | 1 x Composite      |
|                        | 1 x S-Video        | 1 x S-Video               | 1 x S-Video                | 1 x S-Video                | 1 x S-Video                            | 1 x S-Video        |
| Outputs Available      | ○                  | ○                         | ○                          | ○                          | 1 x Composite                          | 1 x Composite      |
|                        |                    |                           |                            | 1 x S-Video                | 1 x S-Video                            |                    |
| Add-on card ? Y / N    | ○                  | ○                         | ○                          | ○                          | ○                                      | ○                  |
| Software Bundle        |                    |                           |                            |                            |  |                    |
| In Price               | PhotoStyler SE     | Premiere 1.1              | Miro WinTools              | Miro WinTools              | VideoStudio 2                          | Premiere 1.1d      |
|                        | Digital Morph      |                           | VideoStudio 2              | VideoStudio 2              |  | Asymedia PE        |
|                        | DVP 3.0            |                           | CAD Tools                  | CAD Tools                  |  | Photoshop SE       |
| Options                |                    | £600 - Video Conferencing | 2Mb £345                   | £599 - Adobe Premiere      | £529 - Videola Pro (lower capture res) |                    |
| CoDecs Included        |                    |                           |                            |                            |  |                    |
| Hardware               |                    |                           | miroCoDec XL (YUV 4:2:2)   | miroCoDec XL (YUV 4:2:2)   | miroCoDec XL (YUV 4:2:2)               | M-JPEG (YUV 4:1:1) |
| Software               | VfW 1.1d           | Indeo v3.2                | VfW 1.1d                   | VfW 1.1d                   | VfW 1.1d                               | VfW 1.1d           |
| Additional Information |                    |                           | Xing-CD MPEG available May | Xing-CD MPEG available May | DC20 to launch in June                 |                    |



## Resolution Limits



## Editor's Choice

In the last six months, the range of video capture cards available to consumers has more than doubled, prices have fallen, installation methods have improved and the quality of bundled software has improved. Using price as a dividing line, we looked at three broad bands to find the best in each.

## Low Cost — below £400

Creative Labs' VideoBlaster SE100 has replaced the VideoSpigot but it's not a big improvement — indeed, it is hard to recommend the SE100 at all. Creative's VideoBlaster RT300 is an altogether better product with the promise of a £600 (approx) add-on for video conferencing due soon. FAST's Aviator is about on a par with the RT300 but still not quite right, especially as it lacks S-Video input. From VideoLogic, the Captivator Pro add-on to the 928 and PCIMovie boards fails to live up to expectations, making the true Captivator board a better buy.

The Highly Commended honours in the budget category belong to Miro's 20TD Live. For multimedia capture at up to 320 x 240 and 25fps, its performance was perfect. It is also ready for Windows 95 and the tuner and digital overlay facility make this an unbeatable combo.

## Medium Cost — £400 to £600

You have to be serious about DTV to spend this kind of money. There are three contenders in this group. The Movie Machine Pro on its own is a strange beast that should really be seen as a replacement for the traditional live video mixing desk. Its greatest advantage is that it is highly upgradable and is the choice for people who will want to make the transition to full non-linear DTV editing in the future. The Intel Smart Video Recorder Pro is a tremendous improvement over the last version in terms of both installation and performance. It is over-priced, though.

Once again it's Miro with the DC1TV that gets our Highly Commended tag. It allows easy installation and output of composite and S-Video signals, and both bundled software packages are worthy purchases in their own right. Combined with the Miro 20TD Live, high-quality full-screen capture is possible.

## High Cost — £600+

Above £600 we are talking serious enthusiasts, semi-professionals and developers. Though the Videola Premium is far better than its sibling (which failed to install), installation was horrendously complicated. S-Video and rescaling do improve the product but it is hard to

recommend it. The most expensive board in the group is the Miro 40PV, due to its multi-functionality. It is a quality graphics card, digital overlay and fast DTV editing board. For developers of multimedia applications this represents great value. Rescaling makes this ideal for kiosk applications.

The Editor's Choice, though, goes to the FAST's combination of the Movie Machine Pro and the M-JPEG add-on card. Installation is not perfect but the results do justify the effort. For a combined price of £950 you can buy a full-PAL capture card, Adobe Premiere, Animator Pro and the Xing-CD M-JPEG to MPEG converter. This gives you the power to make your own Full-Motion Video tapes, professionally edit them and convert them to MPEG for output to CD. Only the lack of S-Video capability lets it down though Fast is about to launch its successor, the Movie Machine II, which corrects this oversight. Value for money and sheer power make this a worthy winner.

## PCW Next Month

See Karl Dunkerley's Hands On Multimedia column, PCW June '95, for more on Digital Video.



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| AUTOSKETCH V 2.0 WIN | £119 |
| ANIMATOR PRO V 1.3   | £249 |
| AUTOCAD LT V 1.0     | £295 |
| AUTOCAD LT (5 USER)  | £980 |

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| DBASE IV V 2.0                             | £138 |
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| REFLEX V 2.0                               | £49  |
| QUATTRO PRO V 5.0 DOS                      | £37  |
| C++ V 4.2 DOS/WIN                          | £125 |
| C++ V 4.2 DOS/WIN CD ROM                   | £99  |
| TURBO C++ V 3.0 DOS                        | £38  |
| TURBO C++ VIS EDITION                      | £47  |
| TURBO PASCAL & OBJECTS V 7.0               | £96  |
| TURBO PASCAL V 7.0 DOS                     | £47  |
| TURBO PASCAL WIN V 1.5                     | £47  |
| PARADOX ENGINE V 3.0 & DATABASE FRAMEWORKS | £70  |
| OBJECT VISION V 2.1 WIN                    | £80  |
| OBJECT VISION PRO V 2.1 WIN                | £129 |

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| FILEMAKER PRO V 2.0 | £95 |
| WORKS WIN           | £49 |

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| SUPERPROJECT WIN    | £178 |
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| CLIPPER TOOLS V 3.0 | £118 |

#### GST

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|---------------------------|-----|
| TIMEWORKS PUBLISHER V 3.0 | £49 |
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| DESIGNWORKS CD ROM        | £49 |
| 1ST PRESS & 1ST DESIGN    | £49 |
| 1ST DESIGN                | £30 |

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| SMARTSUITE V 3.0    | £184  |
| 123 V 2.4 DOS       | £138  |
| 123 V 3.4 DOS       | £138  |
| 123 V 4.0 DOS       | £138  |
| 123 V 5.0 WIN       | £138  |
| FREELANCE V 4.0 DOS | £138  |
| FREELANCE V 3.0 WIN | £138  |
| SMARTPICS           | £89   |
| AMI PRO V 3.01 WIN  | £92   |
| ORGANISER V 1.1     | £49   |
| LICENSES AVAILABLE  | £CALL |

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|                               |        |
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| CREATIVE WRITER               | £31    |
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| DOS 6.22 (OEM)                | £34    |
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| WIN WORKGROUP                 | £88    |
| WIN NT V 3.5 ADV SERVER DUAL  | £299   |
| WIN NT V 3.5 WORKSTATION DUAL | £CALL  |
| WIN NT SINGLE USER            | £CALL  |
| WIN NT 20 USER                | £137   |
| MAIL 3.2 SERVER & 10 USER LIC | £138   |
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| WORD V 6.0 DOS                | £133   |
| ACCESS V 2.0                  | £65    |
| FOXPRO 2.6 DOS                | £85    |
| FOXPRO 2.6 WIN                | £136   |
| EXCEL V 5.0 WIN               | £90    |
| EXCEL/WORD/POWERPOINT/ACCESS  | £138   |
| PROJECT V 4.0                 | £136   |
| POWERPOINT V 4.0              | £68    |
| PUBLISHER V 2.0               | £64    |
| VISUAL BASIC V 3.0 WIN        | £59    |
| VISUAL BASIC V 3.0 DOS        | £68    |
| WORKS V 3.0 DOS               | £68    |
| WORKS V 3.0 WIN               | £68    |
| FORTRAN 5.1                   | £64    |
| MACRO ASSEMBLER V 6.01        | £79    |
| OFFICE V 4.2 FULL COPY        | £177   |
| OFFICE V 4.2 1 MLP            | £138   |
| OFFICE V 4.2 20 MLP           | £2299  |
| OFFICE V 4.2 100 MLP          | £7899  |
| OFFICE V 4.3 PRO              | £265   |
| OFFICE V 4.3 PRO 1 MLP        | £179   |
| OFFICE V 4.3 PRO 20 MLP       | £2699  |
| OFFICE V 4.3 PRO 100 MLP      | £10299 |

#### MICROGRAPHIX

|                          |      |
|--------------------------|------|
| ABC FLOWCHARTER V 3.0    | £155 |
| DESIGNER V 4.01 WIN      | £175 |
| PICTURE PUBLISHER V 4.01 | £170 |
| WINDOWS DRAW             | £40  |
| ORG CHART WIN            | £64  |

#### NEXBASE

|                             |      |
|-----------------------------|------|
| AUTOROUTE EXP DOS UK        | £49  |
| AUTOROUTE EXP WIN UK        | £58  |
| AUTOROUTE EXP DOS EUR       | £49  |
| AUTOROUTE EXP WIN EUR       | £58  |
| AUTOROUTE PLUS V 6.0 DOS UK | £189 |
| AUTOROUTE PLUS V 6.0 WIN UK | £219 |
| MAPBASE V 3.5 DOS           | £250 |
| MAPVISION WIN               | £129 |

#### NOVELL

|                      |       |
|----------------------|-------|
| 3.12 10 USER         | £680  |
| 3.12 25 USER         | £979  |
| 3.12 50 USER         | £1325 |
| 3.12 100 USER        | £1850 |
| 3.12 250 USER        | £3399 |
| 4.01 10 USER CD ROM  | £889  |
| 4.01 25 USER CD ROM  | £1289 |
| 4.01 50 USER CD ROM  | £1689 |
| 4.01 100 USER CD ROM | £2479 |
| 4.01 250 USER CD ROM | £4389 |

#### WORDPERFECT / NOVELL

|                            |      |
|----------------------------|------|
| WORDPERFECT V 6.1A         | £118 |
| WORDPERFECT V 6.1B         | £118 |
| WORDPERFECT V 5.1 + DOS    | £119 |
| WORDPERFECT V 5.2 WIN      | £118 |
| PRESENTATION V 2.0 WIN/DOS | £119 |
| WORKS & QUICKEN V 3.0      | £59  |
| PERFECT OFFICE V 3.0       | £199 |

#### ACCOUNTS

|                                  |      |
|----------------------------------|------|
| QUICKTAX                         | £33  |
| QUICKBOOKS                       | £37  |
| QUICKINVOICE WIN                 | £26  |
| QUICKEN V 6.0 DOS                | £34  |
| QUICKEN V 3.0 WIN                | £32  |
| QUICKEN V 3.0 UPGRADE            | £21  |
| QUICKEN HOME INVENTORY           | £23  |
| QUICKEN UK DELUXE BUS. PACK      | £47  |
| QUICKEN UK DELUXE HOME PACK      | £47  |
| MS MONEY V 3.0                   | £25  |
| SAGE MONEYWISE V 2.0             | £22  |
| SAGE INSTANT ACCOUNTING WIN      | £99  |
| SAGE STG+2 ACCOUNTANT WIN V2.0   | £273 |
| SAGE STG+2 ACCOUNTANT WIN V2.0   | £199 |
| SAGE STG+2 FIN CONT V 2.0 WIN    | £389 |
| SAGE STG ACCOUNTANT+LAN V2.0 WIN | £465 |
| SAGE STG ACCOUNTANT+LAN V7.0 DOS | £399 |
| SAGE STG ACCOUNTANT V7.0 DOS     | £189 |
| SAGE STG ACCOUNTANT LAN V7.0 DOS | £249 |
| SAGE STG ACCOUNTANT+ V7.0 DOS    | £269 |
| SAGE STG BOOK KEEPER V7.0 DOS    | £89  |
| SAGE STG FIN CONT LAN V 7.0 DOS  | £499 |
| SAGE STG FIN CONT LAN V 2.0 WIN  | £595 |
| SAGE STG FIN CONT V 7.0 DOS      | £378 |
| SAGE STG JOB COSTING DOS         | £149 |
| SAGE STG JOB COSTING LAN DOS     | £178 |
| SAGE STG PAYROLL V 2.0 WIN       | £149 |
| SAGE STG PAYROLL II V 4.32 DOS   | £149 |
| SAGE STG PAYROLL II LAN DOS      | £199 |
| TAS BOOKS                        | £79  |
| TAS PAYROLL DOS                  | £79  |
| TAS BOOKS II                     | £589 |
| TAS BOOKS II MULTI USER          | £899 |

#### BUSINESS TOOLS

|                                |      |
|--------------------------------|------|
| BORLAND REPORT SMITH WIN V 2.0 | £59  |
| BORLAND SIDEKICK WIN           | £29  |
| CA SUPER PROJECT V 2.1 DOS     | £425 |
| CA SUPER PROJECT V 3.0 WIN     | £449 |
| LOTUS ORGANISER                | £79  |
| MS OFFICE ASSISTANT            | £59  |
| MS PROJECT 4.0                 | £259 |
| MS PROJECT 4.0 DOS DUAL MEDIA  | £219 |
| MS SCHEDULER+ WIN STARTER PACK | £87  |
| SAGE TELEMAGIC DOS             | £197 |
| SPINMAKER LABELS UNLIMITED WIN | £39  |
| SPINMAKER LABELS UNLIMITED DOS | £28  |
| SYMANTEC ACT                   | £149 |
| SYMANTEC ON TARGET             | £69  |
| MAINSTREAM INFOCENTRAL WP      | £52  |

#### CAD

|                                      |      |
|--------------------------------------|------|
| AUTOCAD LT WIN                       | £355 |
| AUTOSKETCH V 3.0 DOS                 | £57  |
| AUTOSKETCH V 2.0 WIN                 | £129 |
| GENERIC CAD V 6.1 DOS                | £355 |
| FASTCAD 3D DESIGN & FLOORPLAN BUNDLE | £118 |
| FASTCAD CADVANCE WIN                 | £355 |
| FASTCAD EASY CAD V 2.0               | £92  |
| FASTCAD 3D DESIGN & ESTIMATOR BUNDLE | £89  |
| IMSI TURBOCAD II WIN                 | £53  |
| IMSI TURBOCAD V 3.2 DOS              | £53  |
| IMSI TURBOCAD PRO WIN                | £149 |

#### CLIP ART IMAGES & SOUND CLIPS

|                               |     |
|-------------------------------|-----|
| CORELL ARTSHOW V 3.0 CD ROM   | £15 |
| CORELL ARTSHOW V 4.0 CD ROM   | £27 |
| CORELL ARTSHOW V 5.0 CD ROM   | £24 |
| CORELL GALLERY CD ROM         | £28 |
| CORELL PRO PHOTO CD           | £15 |
| MS SOUNDBITS MGM MOVIES       | £14 |
| MS SOUNDBITS FLINTSTONES      | £14 |
| MS SOUNDBITS MUSIC CLIPS      | £14 |
| WP EDU CLIP ART               | £44 |
| WP HOLIDAY CLIP ART           | £41 |
| WP MAINSTREET HOME CLIP ART   | £22 |
| WP MAINSTREET KIDS CLIP ART   | £22 |
| WP MAINSTREET OFFICE CLIP ART | £22 |

#### COMMUNICATIONS

|                               |     |
|-------------------------------|-----|
| PROCOMM PLUS DOS              | £54 |
| PROCOMM PLUS WIN              | £56 |
| PROCOMM PLUS II WIN           | £69 |
| CROSSTALK XVI 3.71 DOS        | £79 |
| CROSSTALK V 2.1 WIN           | £69 |
| DELIRIA DOS FAX PRO V 2.0     | £37 |
| DELIRIA WIN FAX PRO V 4.0     | £55 |
| DELIRIA WIN FAX PRO V 4.0 W/G | £33 |
| CARBON COPY PLUS V 6.1 DOS    | £74 |
| CARBON COPY V 2.0 WIN         | £79 |
| LAPLINK DOS                   | £59 |
| LAPLINK WIN                   | £79 |
| WP MAINSTREET EXP FAX PLUS    | £35 |

#### DATABASES

|                            |      |
|----------------------------|------|
| BORLAND DBASE 5.0 DOS      | £289 |
| BORLAND DBASE 5.0 WIN      | £209 |
| BORLAND DBASE4 2.0 DOS     | £199 |
| BORLAND DBASE COMPILER DOS | £185 |
| PARADOX 4.5 DOS            | £299 |
| PARADOX 5.0 WIN            | £223 |
| RAPIDFILE DOS              | £169 |
| REFLEX 2.0 DOS             | £169 |
| CA CLIPPER 5.2 DOS         | £259 |
| CA CLIPPER TOOLS           | £259 |
| CLARIS FILEMAKER PRO       | £99  |
| DATAASE EXP 1.1 WIN        | £240 |
| DATAASE 5.0 DOS            | £395 |
| DATAASE 5.0 WIN            | £395 |
| DATAASE 4.53 LAN DOS       | £495 |
| LOTUS APPROACH 3.0 WIN     | £82  |
| MS ACCESS 2.0 WIN          | £209 |
| MS ACCESS DEVELOPERS KIT   | £249 |
| MS ACCESS SOLUTION PACK    | £49  |
| MS FOXPRO 2.6 PRO WIN      | £299 |
| MS FOXPRO 2.6 PRO DOS      | £299 |
| MS FOXPRO 2.6 WIN          | £69  |
| MS FOXPRO 2.6 DOS          | £69  |

#### DESKTOP PUBLISHING

|                           |      |
|---------------------------|------|
| ALDUS PAGEMAKER 5.0       | £360 |
| ALDUS PAGEMAKER CLASSIC   | £53  |
| CORELL VENTURA 4.2 WIN    | £122 |
| CORELL VENTURA 5.0 CD ROM | £239 |
| CORELL VENTURA 5.0 DUAL   | £279 |
| MS PUBLISHER 2.0          | £68  |
| SERRIF PAGE PLUS 3.0 WIN  | £49  |
| QUARK EXPRESS WIN         | £569 |

#### GRAPHICS & DESIGN

|                                 |      |
|---------------------------------|------|
| ADOBE ILLUSTRATOR WIN           | £370 |
| ADOBE PHOTOSHOP 3.0             | £489 |
| ALDUS FREEHAND 3.1 WIN          | £249 |
| CORELL DRAW 3 & CLIP ART CD ROM | £79  |
| CORELL DRAW 4.0 CD ROM          | £179 |
| CORELL DRAW 4.0 DUAL            | £278 |
| CORELL DRAW 5.0 CD ROM          | £289 |
| CORELL DRAW 5.0 DUAL            | £389 |
| LOTUS FREELANCE 4.0 DOS         | £219 |
| LOTUS FREELANCE 2.1 WIN         | £249 |
| ABC FLOWCHARTER 3.0 WIN         | £189 |
| MICROGRAPHIX DESIGNER 4.1       | £262 |
| MICROGRAPHIX PICTURE PUBL. 5.0  | £229 |
| VISO 3.0                        | £89  |
| MS POWERPOINT                   | £89  |
| HARVARD GRAPHICS 3.0 WIN        | £199 |
| WP PRESENTATION DOS/WIN         | £199 |

#### INTEGRATED PACKAGES

|                            |       |
|----------------------------|-------|
| LOTUS SMARTSUITE 3.0       | £299  |
| MS OFFICE 4.2              | £305  |
| MS OFFICE 4.2 CD ROM       | £325  |
| MS OFFICE 4.2 COMP UPGRADE | £284  |
| MS OFFICE 4.2 UPGRADE      | £199  |
| MS OFFICE 4.3 PRO          | £399  |
| MS OFFICE 4.3 PRO CD ROM   | £399  |
| MS OFFICE 4.3 COMP UPGRADE | £299  |
| MS OFFICE UPGRADE          | £245  |
| MS WORKS WIN               | £79   |
| MS WORKS DOS               | £78   |
| NOVELL PERFECT OFFICE      | £279  |
| WP WORKS                   | £54   |
| LICENSES AVAILABLE         | £CALL |

#### LANGUAGES & DEVELOPEMENT TOOLS

|                                |      |
|--------------------------------|------|
| BORLAND C++ 4.2 CD ROM DOS/WIN | £199 |
| BORLAND C++ 4.2                | £199 |
| TURBO PASCAL & OBJECTS         | £179 |
| TURBO C++ 3.0 DOS              | £45  |
| TURBO C++ WIN VIS EDITION      | £59  |
| TURBO PASCAL 7.0 DOS           | £55  |
| TURBO PASCAL 1.5 WIN           | £69  |
| MS FORTRAN COMPILER WIN/DOS    | £98  |
| MS MACRO ASSEMBLER             | £79  |
| MS VISUAL BASIC STD DOS        | £73  |
| MS VISUAL BASIC STD WIN        | £73  |
| MS VISUAL BASIC PRO DOS        | £199 |
| MS VISUAL BASIC PRO WIN        | £199 |
| MS VISUAL C++ STD              | £52  |

#### NETWORKING

|                      |       |
|----------------------|-------|
| CORELL SCSI 2.0      | £65   |
| NOVELL 3.12 5 USER   | £79   |
| NOVELL 3.12 10 USER  | £899  |
| NOVELL 3.12 25 USER  | £1335 |
| NOVELL 3.12 50 USER  | £1825 |
| NOVELL 3.12 100 USER | £2535 |
| NOVELL 3.12 250 USER | £4899 |
| NOVELL 4.02 5 USER   | £485  |
| NOVELL 4.02 10 USER  | £1159 |
| NOVELL 4.02 25 USER  | £1790 |
| NOVELL 4.02 50 USER  | £2389 |
| NOVELL 4.02 100 USER | £3369 |
| NOVELL 4.02 250 USER | £5999 |
| NETWARE LITE 1.1     | £42   |
| PERSONAL NETWARE 1.0 | £44   |

#### OPERATING SYSTEMS

|                             |      |
|-----------------------------|------|
| MS DOS 6.22                 | £34  |
| MS DOS 6.22 UPGRADE         | £34  |
| MS WIN 3.11                 | £54  |
| MS WINDOWS FOR WORKGROUPS   | £87  |
| WORKGROUPS ADD ON PACK      | £42  |
| MS WIN NT ADV SERVER        | £399 |
| MS WIN NT WORKSTATION       | £199 |
| MS WIN NT CLIENT SERVER LIC | £35  |
| OS/2 WARP                   | £49  |
| OS/2 WARP CD ROM            | £49  |

#### SPEEDSHEETS

|                             |      |
|-----------------------------|------|
| BORLAND QUATTRO PRO 5.0 DOS | £35  |
| BORLAND QUATTRO PRO 6.0 WIN | £129 |
| CA SUPERCALC 5.5 DOS        | £57  |
| CA SUPERCALC 1.1 WIN        | £57  |
| LOTUS 123 2.4 DOS           | £199 |
| LOTUS 123 3.4 DOS           | £199 |
| LOTUS 123 4.01 DOS          | £198 |
| LOTUS 123 5.0 WIN           | £199 |
| MS EXCEL 5.0 WIN            | £205 |

#### UTILITIES

|                             |      |
|-----------------------------|------|
| PC TOOLS WIN                | £59  |
| PC TOOLS PRO DOS            | £79  |
| XTREE GOLD WIN              | £49  |
| XTREE GOLD DOS              | £65  |
| QEMM 7.5                    | £49  |
| STACKER 4.0                 | £62  |
| UNINSTALLER                 | £45  |
| DR SOLOMANS CHECK IT PRO    | £59  |
| DR SOLOMANS ANTI VIRUS DOS  | £62  |
| DR SOLOMANS ANTI VIRUS WIN  | £72  |
| DR SOLOMANS PC SEC TOOL KIT | £139 |

#### WORD PROCESSING

|                      |       |
|----------------------|-------|
| MS WORD 6.0 WIN      | £209  |
| MS WORD 6.0 DOS      | £149  |
| WORDPERFECT 5.1+     | £210  |
| WORDPERFECT 5.2      | £210  |
| WORDPERFECT 6.1A WIN | £189  |
| WORDPERFECT 6.0B DOS | £189  |
| LOTUS AMW PRO 3.1    | £89   |
| WORDSTAR 7.0 DOS     | £188  |
| WP LETTER PERFECT    | £29   |
| WP GRAMMATIK WIN     | £28   |
| WP GRAMMATIK DOS     | £28   |
| LICENSES AVAILABLE   | £CALL |

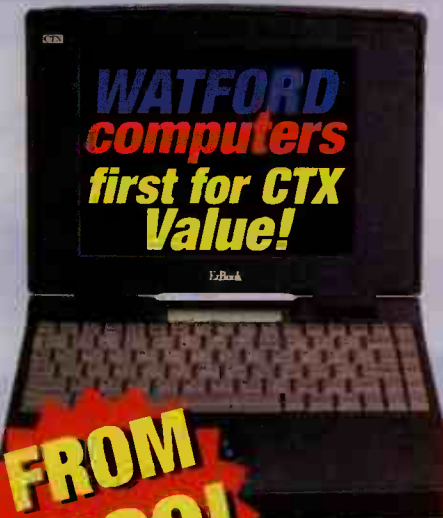


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|        | PROCESSOR  | RAM | H DISK | DISPLAY | PRICE |
|--------|------------|-----|--------|---------|-------|
| NAUM40 | 486SX 33   | 4MB | 260MB  | MONO    | £999  |
| NAUM40 | 486DX2 50  | 4MB | 260MB  | MONO    | £1199 |
| NAUD40 | 486SX 33   | 4MB | 260MB  | STN     | £1399 |
| NAUD40 | 486DX2 50  | 4MB | 260MB  | STN     | £1599 |
| NAUD40 | 486DX2 50  | 4MB | 340MB  | STN     | £1799 |
| NAUD40 | 486DX4 75  | 4MB | 340MB  | STN     | £1899 |
| NAUD40 | 486DX4 100 | 4MB | 340MB  | STN     | £1999 |
| NAUT40 | 486DX2 50  | 4MB | 260MB  | TFT     | £2199 |
| NAUT40 | 486DX4 75  | 4MB | 340MB  | TFT     | £2299 |
| NAUT40 | 486DX4 100 | 4MB | 340MB  | TFT     | £2399 |

### AST ASCENTIA NOTE BOOKS

|              | PROCESSORS | RAM | H DISK | DISPLAY | PRICE |
|--------------|------------|-----|--------|---------|-------|
| 700N4/33M9   | 486SX 33   | 4MB | 120MB  | MONO    | £989  |
| 700N4/33CS9  | 486SX 33   | 4MB | 340MB  | OVAL    | £1275 |
| 800N4/33CS9  | 486SX 33   | 4MB | 250MB  | DUAL    | £1545 |
| 800N4/33CS9  | 486SX 33   | 4MB | 340MB  | OVAL    | £1625 |
| 800N4/50CS9  | 486DX2 50  | 4MB | 250MB  | DUAL    | £1789 |
| 800N4/50CS9  | 486DX2 50  | 4MB | 340MB  | DUAL    | £1875 |
| 900N4/50CS10 | 486DX2 50  | 4MB | 340MB  | OVAL    | £1955 |
| 900N4/50CT9  | 486DX2 50  | 4MB | 340MB  | TFT     | £2885 |
| 900N4/75CS10 | 486DX4 75  | 8MB | 340MB  | DUAL    | £2485 |
| 900N4/75CT10 | 486DX4 75  | 8MB | 510MB  | TFT     | £3395 |

### CANON PRINTBOOKS

|        | PROCESSOR | RAM | H DISK | DISPLAY | PRICE |
|--------|-----------|-----|--------|---------|-------|
| BN32   | 486SL2 50 | 4MB | 260MB  | STN     | £2875 |
| BN100C | 486SX 25  | 4MB | 120MB  | STN     | £1485 |
| BN100C | 486SX 25  | 4MB | 200MB  | STN     | £1885 |
| BN120C | 486SX 33  | 4MB | 200MB  | STN     | £1925 |
| BN120C | 486SX 33  | 4MB | 340MB  | STN     | £2189 |

### COMPAQ AERO

|           | PROCESSOR  | RAM | H DISK | DISPLAY | PRICE |
|-----------|------------|-----|--------|---------|-------|
| AERO4/25  | 486SX 25   | 4MB | 170MB  | MONO    | £849  |
| AERO4/33C | 486SX 33   | 4MB | 170MB  | STN     | £1189 |
| AERO4/33C | 486SX 33   | 4MB | 250MB  | STN     |       |
| S/33D     | 486SX 33   | 4MB | 210MB  | STN     | £1065 |
| S/33C     | 486SX 33   | 4MB | 210MB  | TFT     | £1539 |
| V50/D     | 486DX2 50  | 4MB | 250MB  | STN     | £1775 |
| V50/C     | 486DX2 50  | 4MB | 340MB  | TFT     | £2289 |
| M/75D     | 486DX4 75  | 8MB | 340MB  | STN     | £2725 |
| M/75C     | 486DX4 75  | 8MB | 540MB  | TFT     | £4049 |
| M/100C    | 486DX4 100 | 8MB | 540MB  | TFT     | £3799 |
| M/100T    | 486DX4 100 | 8MB | 540MB  | TFT     | £4049 |

### COMPAQ 400

|       | PROCESSOR | RAM | H DISK | DISPLAY | PRICE |
|-------|-----------|-----|--------|---------|-------|
| 400   | 486DX2 40 | 4MB | 170MB  | MONO    | £1275 |
| 400C  | 486DX2 40 | 4MB | 250MB  | STN     | £1695 |
| 400CX | 486DX2 40 | 4MB | 250MB  | TFT     | £2215 |

### COMPAQ LTE ELITE

|        | PROCESSOR | RAM | H DISK | DISPLAY | PRICE |
|--------|-----------|-----|--------|---------|-------|
| 4/50E  | 486DX2 50 | 4MB | 250    | TFT     | £2485 |
| 4/40C  | 486DX2 40 | 4MB | 170    | STN     | £2559 |
| 4/40CX | 486DX2 40 | 4MB | 170    | TFT     | £3039 |
| 4/40CX | 486DX2 40 | 4MB | 340    | TFT     | £3319 |
| 4/50CX | 486DX2 50 | 8MB | 340    | TFT     | £3979 |
| 4/75CX | 486DX4 75 | 8MB | 340    | TFT     | £4359 |

### IBM THINKPADS

|          | PROCESSOR  | RAM | H DISK | DISPLAY | PRICE |
|----------|------------|-----|--------|---------|-------|
| 340M01   | 486SL2 50  | 4MB | 125MB  | MONO    | £899  |
| 360M01L  | 486SX 25   | 4MB | 170MB  | MONO    | £1375 |
| 360M02L  | 486SX 25   | 4MB | 340MB  | MONO    | £1525 |
| 3600S3L  | 486DX2 50  | 4MB | 170MB  | STN     | £1925 |
| 3600S4L  | 486DX2 50  | 4MB | 340MB  | STN     | £2049 |
| 360TF3L  | 486DX2 50  | 4MB | 170MB  | TFT     | £2345 |
| 360TF42L | 486DX2 50  | 4MB | 340MB  | TFT     | £2475 |
| 755C03   | 486DX4 100 | 8MB | 540MB  | TFT     | £5225 |
| 755C04   | 486DX4 100 | 8MB | 810MB  | TFT     | £5675 |

### NEC VERSA

|        | PROCESSOR  | RAM | H DISK | DISPLAY | PRICE |
|--------|------------|-----|--------|---------|-------|
| S/33M  | 486SX 33   | 4MB | 210MB  | MONO    | £845  |
| S/33D  | 486SX 33   | 4MB | 210MB  | STN     | £1065 |
| S/33C  | 486SX 33   | 4MB | 210MB  | TFT     | £1539 |
| V50/D  | 486DX2 50  | 4MB | 250MB  | STN     | £1775 |
| V50/C  | 486DX2 50  | 4MB | 340MB  | TFT     | £2299 |
| M/75D  | 486DX4 75  | 8MB | 340MB  | STN     | £2725 |
| M/75C  | 486DX4 75  | 8MB | 540MB  | TFT     | £4049 |
| M/100C | 486DX4 100 | 8MB | 540MB  | TFT     | £3799 |
| M/100T | 486DX4 100 | 8MB | 540MB  | TFT     | £4049 |

### PANASONIC NOTE BOOKS

|            | PROCESSOR  | RAM | H DISK | DISPLAY | PRICE |
|------------|------------|-----|--------|---------|-------|
| CFV21P/WM  | 486DX2 50  | 4MB | 450MB  | TFT     | £2759 |
| CFV21P/TNM | 486DX4 75  | 4MB | 450MB  | TFT     | £2999 |
| CFV41      | 486DX4 100 | 8MB | 450MB  | TFT     | £3999 |
| CFV41      | 486DX2 50  | 8MB | 260MB  | TFT     | £3299 |

### TOSHIBA NOTE BOOKS

|         | PROCESSOR | RAM | H DISK | DISPLAY | PRICE |
|---------|-----------|-----|--------|---------|-------|
| T1910   | 486SX 33  | 4MB | 120MB  | MONO    | £845  |
| T19910  | 486SX 33  | 4MB | 200MB  | MONO    | £930  |
| T1910CS | 486SX 33  | 4MB | 200MB  | STN     | £1355 |
| T1950CT | 486DX2 40 | 4MB | 200MB  | TFT     | £1865 |
| T1950CT | 486DX2 40 | 4MB | 320MB  | TFT     | £1995 |
| T2400CS | 486DX2 50 | 4MB | 250MB  | STN     | £1865 |
| T3600CT | 486DX2 50 | 8MB | 250MB  | TFT     | £2545 |
| T3400CT | 486SX 33  | 4MB | 250MB  | TFT     | £2399 |
| T4600C  | 486SL 33  | 4MB | 200MB  | TFT     | £2499 |
| T4600C  | 486SL 33  | 4MB | 340MB  | TFT     | £2875 |
| T4700CT | 486DX2 50 | 8MB | 200MB  | TFT     | £2970 |
| T4700CT | 486DX2 50 | 8MB | 320MB  | TFT     | £3140 |
| T4800C  | 486DX2 75 | 8MB | 500MB  | TFT     | £3565 |
| T4850CT | 486DX4 75 | 8MB | 500MB  | TFT     | £3820 |
| T4900CT | PENT 75   | 8MB | 810MB  | TFT     | £4585 |
| T6600CT | 486DX2 66 | 8MB | 510MB  | TFT     | £4349 |

### T I TRAVELMATE 4000M

|       | PROCESSOR  | RAM | H DISK | DISPLAY | PRICE |
|-------|------------|-----|--------|---------|-------|
| 4000M | 486SX2 50  | 4MB | 200MB  | STN     | £1789 |
| 4000M | 486SX2 50  | 4MB | 340MB  | TFT     | £2275 |
| 4000M | 486DX2 50  | 4MB | 340MB  | STN     | £1989 |
| 4000M | 486DX2 50  | 4MB | 455MB  | TFT     | £2435 |
| 4000M | 486DX4 75  | 4MB | 455MB  | STN     | £2385 |
| 4000M | 486DX4 75  | 4MB | 340MB  | TFT     | £2875 |
| 4000M | 486DX4 100 | 4MB | 520MB  | TFT     | £3525 |

### TRAVELMATE ACCESSORIES

|                           |       |                    |      |
|---------------------------|-------|--------------------|------|
| 4MB RAM UPGRADE           | £1039 | CD ROM DOCKING STN | £620 |
| RECHARGEABLE NiMH BATTERY | £99   | DELUXE CARRY CASE  | £49  |

Please note prices quoted Ex-Vat and Delivery, and are subject to change

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## DESKTOP SYSTEMS

### COMPAQ PRESARIO

|        | PROCESSOR | RAM | H DISK | PRICE |
|--------|-----------|-----|--------|-------|
| 460    | 486SX2 66 | 4MB | 270MB  | £899  |
| 680    | 486SX2 66 | 4MB | 200MB  | £1139 |
| 720    | 486SX2 66 | 8MB | 420MB  | £1299 |
| 510CDS | 486SX2 66 | 4MB | 270MB  | £1139 |
| 520CDS | 486SX2 66 | 4MB | 420MB  | £1219 |
| 720CDS | 486SX2 66 | 4MB | 420MB  | £1299 |
| 920CDS | 486SX2 66 | 8MB | 420MB  | £1459 |

### COMPAQ PROLINEA

|        | PROCESSOR  | RAM | H DISK | PRICE |
|--------|------------|-----|--------|-------|
| 4/333  | 486SX 33   | 4MB | 200MB  | £839  |
| 4/333  | 486SX 33   | 4MB | 340MB  | £709  |
| 4/503  | 486SX2 50  | 4MB | 200MB  | £719  |
| 4/503  | 486SX2 50  | 4MB | 340MB  | £789  |
| 4/50   | 486DX2 50  | 8MB | 200MB  | £938  |
| 4/50   | 486DX2 50  | 8MB | 340MB  | £1018 |
| 4/68   | 486DX2 66  | 8MB | 200MB  | £899  |
| 4/68   | 486DX2 66  | 8MB | 340MB  | £1089 |
| 4/88   | 486DX2 66  | 8MB | 525MB  | £1111 |
| 84/100 | 486DX4 100 | 8MB | 200MB  | £1149 |
| 4/100  | 486DX4 100 | 8MB | 340MB  | £1219 |
| 4/100  | 486DX4 100 | 8MB | 525MB  | £1279 |

### COMPAQ PROSIGNIA

|         | PROCESSOR | RAM  | H DISK | PRICE |
|---------|-----------|------|--------|-------|
| VSM535  | 486DX 33  | 8MB  | 535MB  | £1790 |
| VSM1050 | 486DX 33  | 16MB | 1 GIG  | £2389 |
| VSM535  | 486DX2 66 | 8MB  | 535MB  | £2269 |
| VSM1050 | 486DX2 66 | 16MB | 1 GIG  | £2509 |

### HORIZON SYSTEMS (INTEL PROCESSORS)

| PROCESSOR | RAM | H DISK | PRICE |
|-----------|-----|--------|-------|
| 486SX 33  | 4MB | 210MB  | £889  |
| 486SX 33  | 4MB | 340MB  | £849  |
| 486SX 33  | 4MB | 428MB  | £899  |
| 486SX 33  | 4MB | 540MB  | £729  |
| 486SX 33  | 4MB | 1 GIG  | £1099 |
| 486DX 33  | 4MB | 210MB  | £729  |
| 486DX 33  | 4MB | 340MB  | £739  |
| 486DX 33  | 4MB | 428MB  | £789  |
| 486DX 33  | 4MB | 540MB  | £799  |
| 486DX 33  | 4MB | 1 GIG  | £1159 |
| 486DX2 50 | 4MB | 210MB  | £739  |
| 486DX2 50 | 4MB | 340MB  | £749  |
| 486DX2 50 | 4MB | 428MB  | £779  |
| 486DX2 50 | 4MB | 540MB  | £809  |
| 486DX2 50 | 4MB | 1 GIG  | £1189 |
| 486DX2 66 | 4MB | 210MB  | £759  |
| 486DX2 66 | 4MB | 340MB  | £769  |
| 486DX2 66 | 4MB | 428MB  | £789  |
| 486DX2 66 | 4MB | 540MB  | £828  |
| 486DX2 66 | 4MB | 1 GIG  | £1189 |

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### LASER PRINTERS

|                        |       |
|------------------------|-------|
| <b>BROTHER</b>         |       |
| HL-6                   | £428  |
| HL-6V                  | £463  |
| HL-630                 | £353  |
| HL-680GDI              | £474  |
| HL-1280GDI             | £845  |
| HL-10H                 | £983  |
| EPSON                  |       |
| EPL5200                | £489  |
| EPL5600                | £594  |
| EPL9000                | £994  |
| EPL9000P3              | £1275 |
| <b>HEWLETT PACKARD</b> |       |
| LJ4L                   | £389  |
| LJ4ML                  | £741  |
| LJ4P                   | £598  |
| LJ4MP                  | £855  |
| LJ4 PLUS               | £848  |
| LJ4MV                  | £2049 |
| LJ4M PLUS              | £1270 |
| LJ4SI                  | £2099 |
| LJ4SI/MX               | £2999 |

### NEC

|                  |      |
|------------------|------|
| SCRIPT 810+      | £278 |
| SCRIPT 660       | £405 |
| SCRIPT 660i      | £545 |
| <b>PANASONIC</b> |      |
| KXP 4400         | £284 |
| KXP 4401         | £350 |
| KXP 4430         | £489 |
| KXP 4440         | £776 |

### STAR

|              |      |
|--------------|------|
| WINTYPE 4000 | £287 |
|--------------|------|

### INKJET PRINTERS

|               |       |
|---------------|-------|
| <b>CANON</b>  |       |
| BJ108X        | £187  |
| BJ200         | £180  |
| BJ230         | £238  |
| BJ300         | £344  |
| BJ330         | £389  |
| BJC4000       | £310  |
| BJC800        | £328  |
| BJC800        | £1065 |
| <b>EPSON</b>  |       |
| STYLUS 400    | £139  |
| STYLUS 800+   | £172  |
| STYLUS 1000   | £318  |
| STYLUS COLOUR | £342  |

### 24 PIN PRINTERS

|              |      |
|--------------|------|
| <b>EPSON</b> |      |
| LQ100        | £98  |
| LQ300        | £148 |
| LQ150        | £118 |
| LQ570+       | £186 |
| LQ870        | £352 |
| LQ1070       | £283 |
| LQ1170       | £406 |
| LQ3000       | £987 |

### NEC

|                  |      |
|------------------|------|
| PINWRITER P2Q    | £99  |
| PINWRITER P3Q    | £178 |
| PINWRITER P72    | £372 |
| <b>PANASONIC</b> |      |
| KXP2023          | £119 |
| KXP2135C         | £129 |
| KXP3628          | £285 |
| <b>STAR</b>      |      |
| LC24-300         | £178 |
| LC24-15H         | £234 |
| LC24-20H         | £113 |
| LC240            | £90  |
| LC240 COLOUR     | £103 |

### 9 PIN DOT MATRIX

|                        |       |
|------------------------|-------|
| <b>HEWLETT PACKARD</b> |       |
| DJ320                  | £174  |
| DJ320 & CSF            | £208  |
| OJ520                  | £189  |
| DJ580C                 | £345  |
| CJ1200C                | £828  |
| DJ1200C PS             | £1288 |
| PJ XL300 COL           | £1812 |

### EPSON

|                  |       |
|------------------|-------|
| LX300            | £90   |
| LX1050           | £173  |
| FX870            | £224  |
| FX1170           | £282  |
| <b>PANASONIC</b> |       |
| KXP1150          | £91   |
| KXP3696          | £CALL |
| <b>STAR</b>      |       |
| LC100            | £80   |
| LC15             | £177  |



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### MOTHERBOARDS

|                                  |      |
|----------------------------------|------|
| 386SX 40 WITH CPU                | £47  |
| 386DX 40 WITH CPU                | £89  |
| 486SX VLB 256K CACHE             | £89  |
| 486DX VLB 256K CACHE             | £79  |
| 486DX PCI 256K CACHE             | £89  |
| 486DX VLB / PCI 256K CACHE       | £99  |
| 486DX 4 COMP. PCI 256K CACHE     | £99  |
| PENT. P60/66 256K CACHE PCI/VLB  | £169 |
| PENT. P90/100 256K CACHE PCI     | £179 |
| PENT. P90/100 256K CACHE PCI/VLB | £189 |
| PENT. P90/100 512K PCI           | £199 |

### PROCESSORS (INTEL)

|                    |       |
|--------------------|-------|
| 486SX33            | £46   |
| 486DX33            | £109  |
| 486DX2 50          | £119  |
| 486DX2 66          | £129  |
| 486DX4 100         | £219  |
| P60                | £259  |
| P66                | £329  |
| P90                | £429  |
| P100               | £CALL |
| HEAT SINK WITH FAN | £9    |

### CRYXIX

|           |      |
|-----------|------|
| 486DX40   | £84  |
| 486DX2 50 | £87  |
| 486DX2 66 | £109 |
| 486DX2 80 | £129 |

### CRYX UPGRADES

|                      |      |
|----------------------|------|
| 386SX16/20 - 486SX40 | £129 |
| 386SX25 - 486SX50    | £159 |
| 386DX16/20 - 486DX40 | £139 |
| 386DX25 - 486DX50    | £159 |
| 386DX33 - 486DX66    | £189 |

### INTEL OVERDRIVE CHIPS

|            |      |
|------------|------|
| 486SX2 50  | £85  |
| 486DX2 40  | £119 |
| 486DX2 50  | £119 |
| 486DX2 66  | £139 |
| 486DX4 75  | £289 |
| 486DX4 100 | £359 |

### MEMORY SIMMS

|               |      |
|---------------|------|
| 30 PIN 1 MEG  | £29  |
| 30 PIN 4 MEG  | £119 |
| 72 PIN 4 MEG  | £129 |
| 72 PIN 8 MEG  | £235 |
| 72 PIN 16 MEG | £425 |

### CD PROCESSORS

|            |     |
|------------|-----|
| 80387SX-33 | £42 |
| 80387SX-40 | £44 |
| 80387DX-33 | £44 |
| 80387DX-40 | £45 |

### KEYBOARDS

|                 |     |
|-----------------|-----|
| 102 KEY QWERTY  | £14 |
| 102 KEY MITSUMI | £14 |
| 102 KEY CHERRY  | £24 |

### POINTER DEVICES

|                     |     |
|---------------------|-----|
| SUPERHOUSE II £9    |     |
| MS MOUSE            | £34 |
| MS HOME MOUSE       | £24 |
| LOGITECH PILOT PS/2 | £19 |
| LOGITECH SERIAL     | £19 |
| LOGITECH CORDLESS   | £55 |

### CASES WITH PSU

|            |     |
|------------|-----|
| DESKTOP    | £39 |
| MINI TOWER | £39 |
| MIDI TOWER | £49 |
| FULL TOWER | £79 |
| MULTIMEDIA | £99 |

### CONTROLLER CARDS

|                        |     |
|------------------------|-----|
| SA MULTI I/O           | £9  |
| VLB MULTI I/O          | £12 |
| VLB ENHANCED MULTI I/O | £19 |
| 2 PORT SERIAL/PARALLEL | £14 |
| 2 PORT SERIAL          | £10 |

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### TAPE BACKUP

|                        |      |
|------------------------|------|
| COL JUMBO 120 INT      | £89  |
| COL JUMBO 250 INT      | £99  |
| COL TRACKER 250 EXT    | £209 |
| COL TRACKER 700 EXT    | £359 |
| IONEGA 250 INT         | £110 |
| IONEGA 700 INT         | £265 |
| IONEGA 700 EXT         | £339 |
| DC2120 TAPES           | £11  |
| CONNER 2 GIG DAT INT   | £639 |
| CONNER 8 GIG DAT INT   | £689 |
| WANGTEK 500 SCSI INT   | £389 |
| WANGTEK 500 SCSI EXT   | £539 |
| WANGTEK 1 GIG INT SCSI | £489 |
| HP 2 GIG 35470         | £599 |
| HP 8 GIG 35480         | £899 |
| 2 GIG DAT TAPES        | £13  |



### HARD DRIVES

|            |      |
|------------|------|
| CONNER     |      |
| 210 MB IDE | £105 |
| 250 MB IDE | £119 |
| 420 MB IDE | £139 |
| 540 MB IDE | £169 |
| 1 GIG IDE  | £339 |
| FUJITSU    |      |
| 264 MD IDE | £115 |
| 355 MD IDE | £145 |
| 532 MB IDE | £179 |

### MAXTOR

|            |      |
|------------|------|
| 270 MB IDE | £133 |
| 345 MB IDE | £135 |
| 420 MB IDE | £159 |
| 540 MB IDE | £175 |
| QUANTUM    |      |
| 170 MB IDE | £85  |
| 270 MB IDE | £109 |
| 365 MB IDE | £129 |
| 420 MB IDE | £149 |
| 540 MB IDE | £159 |
| 730 MB IDE | £199 |
| SEAGATE    |      |
| 170 MB IDE | £99  |
| 260 MB IDE | £109 |
| 340 MB IDE | £119 |
| 428 MB IDE | £139 |
| 540 MB IDE | £169 |
| 1 GIG IDE  | £299 |

### WESTERN DIGITAL

|                      |      |
|----------------------|------|
| 340 MB IDE           | £139 |
| HARD DRIVES SCSI     |      |
| SEAGATE 525 SCSI     | £179 |
| SEAGATE 1.5 GIG SCSI | £389 |
| SEAGATE 1.7 GIG SCSI | £699 |
| SEAGATE 2.1 GIG SCSI | £749 |
| QUANTUM 540 MB SCSI  | £189 |
| QUANTUM 730 MB SCSI  | £229 |
| QUANTUM 2.1 GIG SCSI | £799 |

### FLOPPY DRIVES

|                      |     |
|----------------------|-----|
| 1.44 MB MITSUMI 3.5" | £23 |
| 1.44 MB SONY 3.5"    | £25 |
| 1.2 MB MITSUMI 5.25" | £39 |

### DIAMOND

|                         |      |
|-------------------------|------|
| SPEEDSTAR PRO 1MB ISA   | £94  |
| SPEEDSTAR PRO 2MB ISA   | £149 |
| STEALTH 64 1MB DRAM VLB | £102 |
| STEALTH 64 1MB DRAM PCI | £102 |
| STEALTH 64 2MB DRAM VLB | £139 |
| STEALTH 64 2MB DRAM PCI | £139 |
| STEALTH 64 2MB VRAM VLB | £249 |
| STEALTH 64 2MB VRAM PCI | £249 |
| STEALTH 64 4MB VRAM VLB | £369 |
| STEALTH 64 4MB VRAM PCI | £369 |
| ORCHID                  |      |
| KELVIN 64 1MB ISA       | £109 |
| KELVIN 64 1MB VLB       | £109 |
| KELVIN 64 1MB PCI       | £109 |
| KELVIN 64 2MB ISA       | £142 |
| KELVIN 64 2MB VLB       | £142 |
| KELVIN 64 2MB PCI       | £142 |

### MONITORS

|                           |      |
|---------------------------|------|
| HORIZON 14".39 SVGA       | £159 |
| HORIZON 14".28 SVGA       | £169 |
| (1 YEAR ON SITE WARRANTY) |      |



|                    |       |
|--------------------|-------|
| CTX 14" SVGA       | £179  |
| CTX 15" SVGA       | £299  |
| CTX 17" SVGA       | £499  |
| SAMSUNG 14".39     | £169  |
| SAMSUNG 14".28     | £179  |
| SAMSUNG 15"        | £299  |
| SAMSUNG 17"        | £499  |
| SAMSUNG 20"        | £999  |
| NEC3V              | £307  |
| NEC4E              | £364  |
| NEC5FGP            | £862  |
| NEC6FGP            | £1419 |
| TAXAN EV400LR      | £188  |
| TAXAN EV410LR      | £195  |
| TAXAN EV788LR      | £215  |
| TAXAN 788LR        | £265  |
| TAXAN ERGO 580LR   | £292  |
| TAXAN ERGO 885LR   | £624  |
| TAXAN ERGO 880LR   | £520  |
| TAXAN ERGO 895LR   | £835  |
| TAXAN ERGO 1080LR  | £909  |
| TAXAN ERGO 2100LR  | £1565 |
| TAXAN ULTRA 1085LR | £1489 |
| PHILIPS 14M        | £189  |
| PHILIPS 15B        | £259  |
| PHILIPS 17C        | £429  |
| PHILIPS 20C        | £940  |
| PHILIPS 20T        | £1315 |
| PHILIPS 21A        | £CALL |
| SONY 155F          | £299  |
| SONY CPD1730       | £595  |
| SONY GDM17SE1      | £825  |
| SONY GDM20SE1VT    | £1315 |

### SCSI CONTROLLERS

|                     |      |
|---------------------|------|
| ADAPTEC 1510        | £55  |
| ADAPTEC 1542 (BARE) | £129 |
| ADAPTEC 1542        | £174 |
| ADAPTEC 2842        | £189 |
| ADAPTEC 2840        | £239 |
| ADAPTEC 2742        | £289 |
| PROMISE DC2040      | £149 |

### MULTI MEDIA VIDEO PRODUCTS

|                            |       |
|----------------------------|-------|
| CANON ION RC260            | £475  |
| CANON RC260 CAMERA ONLY    | £250  |
| CANON RC560 ION CAMERA     | £1985 |
| CANON RC560 PC KIT         | £2485 |
| CREATIVE SE VIDEO BLASTER  | £184  |
| CREATIVE FS200             | £240  |
| CREATIVE VIDEO SPIGOT      | £172  |
| CREATIVE TV COOLER         | £109  |
| DIAMOND VIDEOSTAR          | £279  |
| WIN TV CELEBRITY           | £289  |
| WIN TV CINEMA              | £199  |
| INTEL SMART VIDEO RECORDER | £339  |
| LOGITECH FOTOMAN PLUS      | £382  |
| VIDEOLGIC CAPTIVATOR       | £169  |
| VIDEOLGIC CAPTIVATOR PLUS  | £189  |
| 928 MOVIE ISA/VLB          | £189  |
| 928 MOVIE & SOUND ISA/VLB  | £249  |
| VIDEOLGIC MPEG PLAYER      | £229  |
| VIDEOLGIC MPEG & 928       | £429  |
| VIDEOLGIC PCI MOVIE        | £329  |
| VIDEOLGIC CAPTIVATOR PRO   | £219  |



### MODEMS

|                        |      |
|------------------------|------|
| ZOLTRIX                |      |
| 14400 FAX/MOD INT      | £69  |
| 14400 FAX/MOD EXT      | £89  |
| 14400 VOICE FAX/MOD    | £89  |
| 28800 FAX/MOD INT      | £109 |
| 28800 FAX/MOD EXT      | £139 |
| US ROBOTICS            |      |
| 14400 SPORTSTER INT    | £142 |
| 14400 SPORTSTER EXT    | £142 |
| 14400 WORLDPORT PCMCIA |      |
| CELLULAR               | £219 |



### SOUND CARDS

|                           |      |
|---------------------------|------|
| CREATIVE                  |      |
| S8 PRO VALUE              | £52  |
| S8 16 VALUE               | £69  |
| S8 16 MULTI CD            | £80  |
| S8 16 MULTI CD ASAP       | £119 |
| S8 16 SCSI II             | £115 |
| S8 16 SCSI II AOSP        | £139 |
| S8 AWE 32                 | £179 |
| MIDI KIT                  | £49  |
| GRAVIS                    |      |
| ULTRA SOUND               | £88  |
| ULTRASOUND MAX            | £143 |
| MIDI KIT                  | £29  |
| PORTABLE SOUND PLUS       | £119 |
| ORCHID SOUND DRIVE 16EZ   | £75  |
| ORCHID GAMEWAVE           | £84  |
| ORCHID SOUND WAVE 32      | £128 |
| ORCHID SOUND WAVE 32 SCSI | £163 |



### SPEAKERS

|                      |     |
|----------------------|-----|
| LABTEC CS150         | £17 |
| SOUNDPEAT QS820      | £13 |
| CREATIVE PRO DIGITAL | £33 |
| ZYFI PRO 13W         | £45 |
| HORIZON 25W          | £24 |
| HORIZON 80W          | £49 |
| QS817P               | £49 |

### CD ROM DRIVES

|                    |       |
|--------------------|-------|
| MITSUMI 3K         | £119  |
| MITSUMI 4K         | £159  |
| PANA CR652B        | £89   |
| PANA CR652B & CONT | £87   |
| CREATIVE 563       | £129  |
| NEC 3XE            | £309  |
| NEC 3XI            | £229  |
| NEC 3XP            | £249  |
| NEC 4XE            | £389  |
| NEC 4XI            | £272  |
| NEC 4XP            | £509  |
| SONY 30U33A        | £89   |
| PHILIPS 21A        | £CALL |
| SONY 155F          | £299  |
| SONY CPD1730       | £595  |
| SONY GDM17SE1      | £825  |
| SONY GDM20SE1VT    | £1315 |

### GRAPHICS CARDS

|                   |     |
|-------------------|-----|
| 256K VGA          | £20 |
| 512K VGA          | £27 |
| 1 MEG SVGA ISA    | £44 |
| 1 MEG S3 SVGA VLB | £89 |
| CIRRUS LOGIC      |     |
| 1MB 5424          | £55 |
| 1MB 5426          | £69 |
| 1MB 5428          | £84 |
| 1MB 5434          | £79 |
| 2MB 5434          | £99 |

Please note prices quoted Ex-Vat and Delivery, and are subject to change

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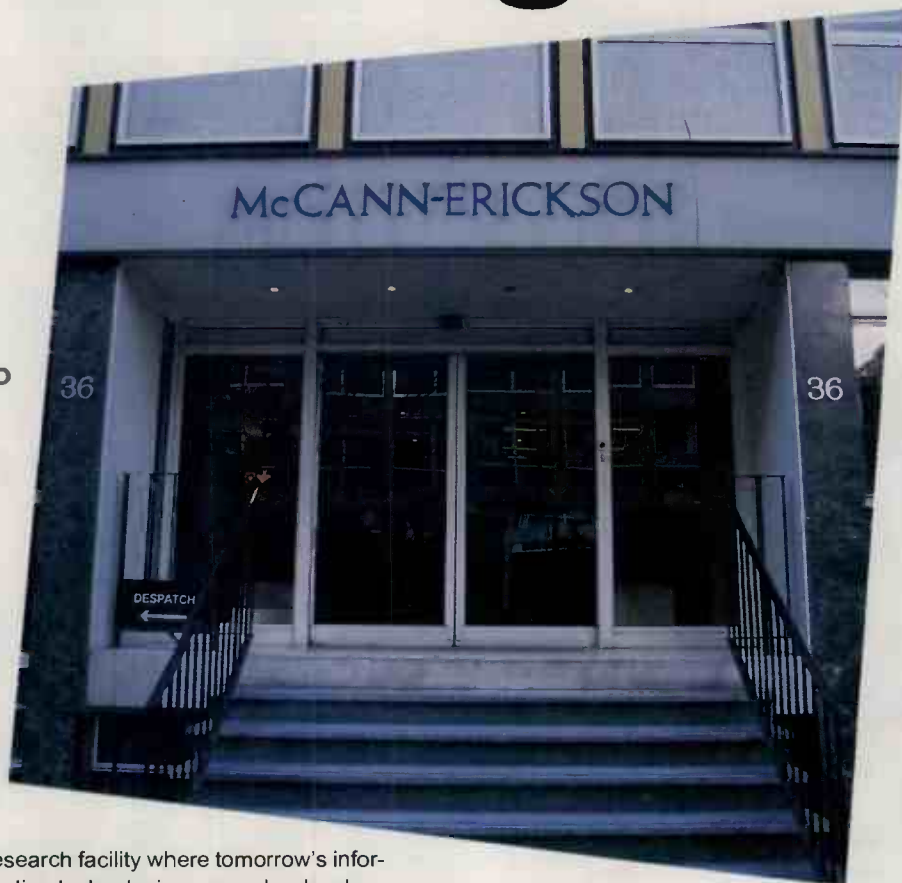




# How to get ahead in advertising

Never slow to capitalise on new technology, advertising giant McCann-Erickson has installed an integrated data and voice network to link many of its 221 agencies worldwide. Despite a few hitches it has proved one of the best investments the company ever made, as Camille Mender discovered.

CASE STUDY: McCANN-ERICKSON



In the world of advertising, the rapid delivery of information to consumers counts as highly as the message conveyed. No wonder, then, that global advertising firm McCann-Erickson identifies its networking infrastructure as a crucial plank of its business strategy. But the advertising giant, which numbers clients such as Coca-Cola, Sega Europe and Nestlé, is also focused on keeping operational costs down. And with 221 agencies in 160 cities in 95 countries, which need to communicate with each other, keeping those costs to a minimum is not simple.

However, the company has always considered technology an answer to many business problems. McCann-Erickson is a sponsor of the Massachusetts Institute of Technology's Media Lab, the Cambridge, Massachusetts-based

research facility where tomorrow's information technologies are under development (see "Media Day" at MIT, *PCW* March 95). In 1992, the company launched McCann Interactive, an interactive media service firm. This openness to information technology may well have helped McCann-Erickson win multinational accounts with leading technology firms such as network operator AT&T and software vendor Lotus Development Corporation.

Improving communication between geographically distant teams working for clients on multinational accounts was a major reason McCann-Erickson recently decided to link its London office to its US network hub in Louisville, Kentucky, and why it is now considering building links to other European offices. Creative departments in the United States often design advertising for the European market, and the company's work for clients is increas-

ingly distributed over different international offices. One driver for network expansion was the company's work for the United Parcel Service of America, a leading air and ground package delivery company which is extending its services outside the US. The account's co-ordination centre is in London. Related IT infrastructure plans are to standardise on Lotus Notes across the worldwide company, and to set up desktop video-conferencing links between account teams and clients.

## Netrix Telecom Systems

Three years ago, McCann-Erickson installed an integrated data and voice network linking ten US offices. The supplier was Netrix Telecom Systems, a vendor of data/voice integration products





(DVI), formerly known as Republic Telecom Systems. For its planned London link, McCann-Erickson again chose Netrix because of its strong relationship with the company. A network manager at McCann-Erickson's US network hub had been hired from within Netrix to support the company network.

The London-Louisville link, which became operational in October, was built using the Netrix RNET voice packet networking system, which compresses and packetises voice, fax and data traffic. The international X.25 link interconnects a Netrix RNET switch in London to an RNET in Louisville, both of which are connected to local nodes using RLX packet multiplexers. Network operators AT&T and Mercury Communications are providing McCann-Erickson's international link, which is currently a 64kbps connection and will be upgraded to 128kbps as other European offices come online.

The advantage of installing such DVI networks comes in network performance and reduced costs. Netrix's RNET network, for example, uses a technique called time-division multiplexing to allocate virtual channels to different types of network traffic. Bandwidth is allocated according to the time of day, so bandwidth could be all calls during office hours, all data overnight, or a mixture of both. The system is also built to route calls to their destination automatically, according to predefined routing tables. Consultancy firm International Data Corp has found an increasing number of corporates are turning to this technology, which can substantially reduce communications costs by using only low-capacity leased lines.

"The opportunity for DVI products in Europe is significant because leased lines and long-distance charges are so expensive," says Curtis Price, research manager at IDC's Framingham, Massachusetts headquarters. McCann-Erickson expects big savings from integrating voice, data, fax and LAN traffic over its DVI network, although it hasn't yet started measuring them, according to Tony Barker, the company's UK network manager.

"But the savings in voice traffic alone make this equipment justifiable," says Barker. McCann-Erickson's international

*We're talking speed here. Never mind making it to the billboard on time, this ad could be halfway around the world before you could say, "Let's do lunch"*

link is currently configured to handle five voice calls simultaneously as well as three data or fax calls. The company has already saved around £6,000 in long-distance charges between the UK and the United States, and the ability to send advertising copy and art over the network will also mean substantially reduced courier charges.

Plans are now underway to extend



● McCann-Erickson's London office has direct voice and data links with the company's US network hub in Kentucky. Similar links are planned with other creative hotbeds across Europe



64kbps links first to Paris, then to other European offices in Zurich, Frankfurt, Milan and Madrid. Barker says that the low cost of ISDN in France may dictate its use when the McCann-Erickson network extends to Paris. ISDN is commonly used as a network backup in DVI networks.

McCann-Erickson's early experience with the international RNET link has been a positive one. The two-star network configuration means that realtime call routing is possible between network nodes. However, Barker does note some quality degradation as voice calls pass through the RNET switches. The RNET system is based on Xenix, which Barker says is easy to configure and manage. Indeed, network managers at the company's Louisville hub are able to oversee network operations remotely. This remote capability will be useful as the network is deployed in Europe.

There have been hitches. In November, two cables accounting for half of UK-to-US fibre-optic capacity were knocked out by a fishing incident, but Barker praises the built-in network redundancy of its network operators for their quick response to the outage. The network was only down for 15 minutes, albeit at prime time, and AT&T and Mercury quickly and invisibly re-routed traffic via satellite.

Another problem occurred when the London office was told late one Friday that a client's ad had to be placed in a newspaper by the following Saturday to make the deadline for publication on Monday. The advertising copy was in the United States and was sent to London via the international network for approval by the client. Unfortunately, the large 25Mb file was not compressed before it was sent, which meant it took over five hours to receive instead of the expected 30 minutes. Luckily, the ad still made the deadline.

"We could have designed the ad ourselves in that time. But the experience told us we had to get word out in the company about data compression," says Barker. The lack of compression standards is another issue which concerns Barker and other users of DVI equipment. Users are effectively tied to their suppliers because each supplier employs different compression methods. Last year, AT&T subsidiary AT&T Paradyne organised an initiative to put

## All About McCann-Erickson

**Headquarters** New York; offices in 95 countries

**Established** 1927

**Activity** Global advertising

**Worldwide billings** [not turnover] worth \$6.7 billion in 1993, £370 million in the UK

**IT goals** Improve inter-office communications; reduce operational costs; develop new ways to manage clients' accounts

**Former network setup** Ten-node data/voice network in US linked with 64kbps leased lines

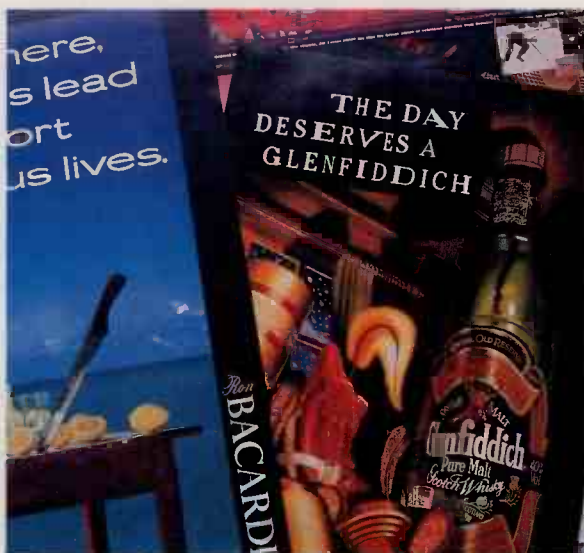
**New network setup** 64kbps Louisville-London link to US network; plans for 128kbps link

**Applications** Transmission of compressed voice, data, image and fax traffic; Lotus Notes; desktop video conferencing planned

**Advantages gained through new technology** Lower international call charges; ability to send advertising copy and art more efficiently; support for distributed, project-driven work environment

**Lessons learned** Ensure staff are informed about capabilities of technology (e.g. data compression). If the technology employs proprietary features, carefully evaluate vendor's products and position in the market before committing to it; look for a solution which allows network management from a central site and scalability as the network grows; check voice transmission quality isn't compromised

**Hardware costs** [approximate] Netrix (supplier, on 01344 715300) RNET Voice Packet Switch: \$60,000-\$100,000; RIO Access Multiplexer: \$50,000; plus RLX Packet Multiplexer: \$7,000-\$10,000



together compression standards, but results aren't expected yet. Barker says his faith in Netrix's technology means this issue is not of immediate concern.

The next step for McCann-Erickson is to distribute desktop video-conferencing facilities across Europe. Video-conferencing suites already in place in the company have proved their worth, and using them is often more effective and certainly cheaper than sending staff to meet clients at their offices. McCann-Erickson is also considering the use of desktop video-conferencing to foster more active links with clients and for working co-operatively on advertising campaigns. The company plans to install AT&T Vistium video-conferencing PCs in all its European offices to facilitate work on pan-European accounts, and it is

standardising on Lotus Notes in order to manage these accounts.

To prepare for this move, it has also installed a Netrix RIO access multiplexer in London. The device provides a digital interface to PBXs to process voice and fax traffic, but is also designed to deliver increased bandwidth when video-conferencing is used. The addition of video-conferencing capabilities to the McCann-Erickson network will necessitate additional bandwidth and higher transmission speeds, an issue Barker is investigating. However, the RIO's capabilities are scalable up to 2Mb/sec.

The company-wide standardisation on Lotus Notes is an initiative driven by McCann-Erickson in Europe. Barker says it will be easier to implement in Europe because the company structure mirrors Lotus Notes' distributed approach to managing information and projects. McCann-Erickson is practising what it preaches since both Lotus and AT&T are its clients, but the company's continuing investment in technology has a clear business objective: it will cement McCann-Erickson's leading position in the advertising market.

## PCW Case Studies

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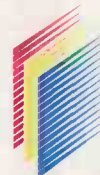
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**A** second wave of personal digital assistant products (PDAs) — generally offered under the new heading of "personal communicators" — has enthralled the PC industry with stories of handheld wonderment. Typically, these new devices include built-in wireless communication of some sort, through cellular, paging or infra-red communication, and are more modest in what they hope to accomplish than their predecessors. Talk of handwriting recognition is also being considerably played down.

Playing their hands in this communications-based assault are Sony, Motorola and Sharp. Windows-based PDA products that were supposed to come out of the WinPad development effort by Intel and Microsoft (along with Compaq and other OEM customers) are being delayed

until at least 1996, if not later.

The most innovative of these new devices, which come bundled with communications services, are currently only available in the US, although negotiations are underway to bring them to areas including Canada, the UK and Europe. The technological goal they represent is so compelling that you cannot fail to be entranced.

## **Motorola Envoy**

The second wave of PDAs started last year with the announcement of the Motorola Envoy Wireless Communicator, which pioneered the use of several key communications technologies. A substantial unit, weighing 1.7lb and measuring 7.6 x 5.8 x 1.2in, it incorporated two-way wireless and wireline communication in a

handheld computer for the first time, using the long-awaited Magic Cap graphical operating environment, the TeleScript communications language and the TeleScript-aware AT&T PersonalLink communications service.

The idea behind these technologies was to offer users a simple way to accomplish all kinds of data communications tasks from a handheld, pen-based palmtop computer: from electronic mail to "smart" paging, faxing, personal information management, and scheduling to Windows and Macintosh-based data exchange.

Envoy was different, first and foremost, because it included a built-in, two-way wireless packet data modem that would allow Envoy users to send and receive messages, faxes and pages, as well as services such as AT&T PersonalLink and RadioMail. It used the hardware you would expect to find in a good, state-of-the-art PDA, without offering any surprises. The Envoy offered two PCMCIA Type II slots, a monochrome 480 x 320 resolution LCD touch-screen, a proprietary Motorola expansion port called MagicBus (which allows you to connect the Envoy to up to six add-on devices such as keyboards, scanners and printers), a built-in speaker and microphone, a removable, rechargeable NiCad battery, 1Mb RAM, 4Mb ROM, and the Motorola Dragon 1/68349 3.3v processor.

In addition, Envoy included the aforementioned built-in wireless and wired modem (with standard RJ11 telephone connection) as well as an infra-red link. This link is designed to allow data to be "beamed" between two Envoy (or other compatible Magic Cap devices); it is not designed to be used with other non-Magic Cap based devices.

Envoy began shipping in the US to



distributors in late December 1994, and in mid-February this year Motorola announced it was now available nationally in the US in "select reseller and distributor locations". The comms services on the shipping product come bundled with software to connect users to two communications services: AT&T PersonaLink Services; and RadioMail, connected via the ARDIS nationwide wireless data communications network. Motorola says ARDIS services more than 90 percent of the business areas in the US, including 400 metropolitan areas, which encompass 10,700 cities and towns.

Motorola describes AT&T PersonaLink Services as "an electronic community" where people can send and receive messages, gather news and information, and even shop. PersonaLink is also the first online service to incorporate Telescript electronic "intelligent

**Beef up your ZR-5000 with the Sharp CE-FM4 9600bps/2400bps faxmodem, which attaches directly to its serial port**



● **Sharp's Zaurus ZR-5000 provides infra-red communications, built-in word processing, long filename support, a PCMCIA expansion slot, optional faxmodem, 1Mb of memory, and more besides — not bad for a machine weighing less than 1lb and running on two AA batteries**

assistants", which give subscribers tremendous control over their communications. Subscribers can program the intelligent assistants to do tasks such as sort, prioritise and forward electronic mail to virtually any email service, including the Internet.

PersonaLink is supposed to offer

subscribers "cost and convenience options with a robust online service that will fully integrate wireless and wireline communications". It is designed as a nationwide radio packet data service with automatic roaming, full end-to-end encryption (for enhanced security) and wireless access to the user's electronic mailbox. Also promised for the second quarter of this year is AT&T Market Square Plaza, an electronic shopping service offering clothing, flowers, computer equipment and collectables.

RadioMail, meanwhile, allows wireless messages and information to reach Envoy communicators in all locations where ARDIS service is available. This service enables users to communicate wirelessly with a broad population of electronic mail users via the Internet and commercial public mail systems.

The Envoy also features built-in software which allows access to available services from America Online and Official Airline Guides (OAG) FlightLine Service. America Online allows users to receive stock quotes and communicate with electronic mail users. The OAG FlightLine Service offers air travellers direct access to timely flight information. The Envoy also comes with Intuit's Pocket Quicken, an application that allows users to manage personal finances.

Motorola says it is working with multiple independent software developers who have created a variety of applications and services for the device. More than 15 applications, ranging from spreadsheets to desktop connectivity kits, are available, and Motorola and General Magic say they will continue to work with independent software developers to create more applications and services.





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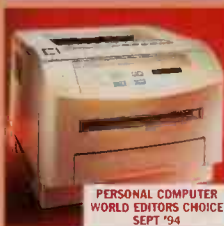
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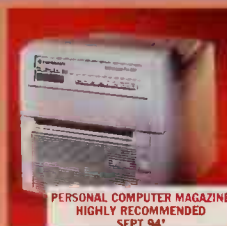
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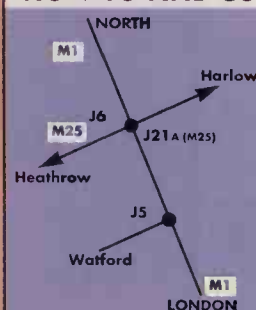
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In the US, Motorola predicts a street price ranging from \$1,000 to \$1,500, depending on configuration. Accessories include carrying cases, a travel and a rapid charger, and replacement parts such as batteries, power adaptor and stylus. Future versions may run on other networks, such as Motorola's DataTAC 5000 and DataTAC 6000 systems (throughout Asia and Europe respectively), RAM Mobile Data, Cellular Digital Packet Data (CDPD), Motorola's ReFLEX and InFLEXION systems, and the Motorola Integrated Radio System (MIRS) service providers. Motorola says it will base its plans for future network support on customer feedback.

### Sony Magic Link

Meanwhile, Sony's recently announced Magic Link Personal Intelligent Communicator 1000 offers many of the same features of the Envoy implemented in a slightly different fashion. It weighs only 1.2lb, is selling in the US for \$995 and uses Magic Cap TeleScript and the AT&T PersonalLink Services network to deliver functions such as downloading electronic mail or receiving pager messages.

Magic Link includes a built-in 2400-baud modem, although faster internal modems are expected when Sony can get them onto the single-chip design used in Magic Link. It comes with a modest 1Mb RAM and only has available expansion to 2Mb via a PCMCIA memory card.

Sony and Motorola will not be alone in the Magic Cap market for much longer. A number of other companies have already indicated their enthusiasm for producing Magic Cap based systems, and General Magic has announced plans to bring the application to the desktop. One key supporter could be Japanese electronics giant Matsushita, the parent company of Panasonic, which has already committed itself to producing some form of Magic Cap based product in the near future.

### Sharp Zaurus

All these Magic Cap products are a million miles away from what is being envisioned by Sharp, one of the longest running supporters of the whole PDA concept. Sharp wants you to imagine a computer that weighs less than 1lb, runs on two AA batteries, and provides infra-red communications, built-in word processing, long filename support, a PCMCIA expansion slot, optional faxmodem, 1Mb of memory, built-in communications software, pen-based drawing



software and pen-based control — as well as offering QWERTY-based keyboard data entry.

And then you can stop imagining. The machine is here now and goes by the name of Sharp Zaurus ZR-5000. The Zaurus was unleashed on the world at the Fall Comdex 94 show in Las Vegas and finally started shipping in March with a full range of peripherals including a proprietary faxmodem, optional infra-red printer interface, PC Link hardware and software package (available for use with Windows or Apple Mac), PCMCIA RAM cards, infra-red PC communications interface and PCMCIA Flash memory cards.

On first inspection, the Sharp Zaurus ZR-5000 is a lightweight, compact, "flip-open" palmtop computer that's slightly smaller than Apple's Newton or the Casio/Tandy Zoomer. It's a little larger, though, than the likes of the Psion Series 3a or any one of the legion of databank calculators.

At the heart of the device is a proprietary, Sharp-designed, 16-bit processor that boasts low power consumption: up to two months of battery life promised for the AA batteries it uses. With 1Mb of internal memory — 750kb of which is available for user data and add-on software — Sharp is hoping the Zaurus will be an attractive platform for corporate and software developers. Its target customers are primarily mobile professionals, particularly in the medical, pharmaceutical and insurance fields.

Like Sony and Motorola, Sharp is counting on communications to make the

*Sony's pretty little Magic Link includes a 2400-baud modem, and has 1Mb RAM upgradable to 2Mb*

difference, via either Sharp's own optional modem or any compatible third-party PCMCIA modem. The company promises that Zaurus users will be able to send or receive messages and data using services such as AT&T Mail in the US, and access online services such as CompuServe easily.

The optional Zaurus Mail system is supposed to allow small workgroups to exchange messages and data using a single Windows-based PC as an electronic post office. Users will be able to access Zaurus Mail in the office via infra-red technology or dial into the system from the road. The Mail software on the PC can be instructed to send important messages to an optional PCMCIA pager card in the Zaurus.

The PCMCIA Type II slot is also the route to expanding the memory and communications capabilities of the Zaurus. Additional memory can be added using up to 2Mb SRAM cards or 16Mb Flash cards. Many PCMCIA Type II devices, including cellular-capable faxmodems and pager cards, will be available. Drivers for future PCMCIA Type II devices will apparently be provided by Sharp as needed, and they'll be user-installable.

Alternatively, you can give Sharp your money for add-ons and buy its Sharp CE-FM4 9600bps/2400bps faxmodem, which attaches directly to the serial port on the side of the Zaurus. This has the virtue of adding very little to the size of the main unit and leaves the PCMCIA Type II slot open



## In Defence Of The PDA

If you read all the stories written about personal digital assistants over the last three years you might well conclude they were complete and abject failures. But as a long-time PDA user and reviewer, it is my belief that the problem lies in the expectations of manufacturers and the computer press.

In 1992 — PDA Year One — a personal digital assistant was a palmtop version of your desktop computer. It was best represented by systems such as the HP 100LX, which ran MSDOS and aimed to run whatever DOS applications you wanted to put on it (provided those applications could run on the limited storage and RAM available on the handheld systems of the day).

Disappointment was often the order of the day for these machines, though, as they arrived at the very moment when many users (particularly the technologically enthusiastic "early adopters" who would be the first to try them) were switching from DOS to Windows. And as soon as those users switched on a palmtop computer they were forced back into using DOS — along with memory and storage limitations that were two or three years behind those of desktop machines.

By the time PDA Year Two rolled around, DOS compatibility was less of an issue, and it was assumed that only those PDA systems that were controlled by a pen and were capable of handwriting recognition were of any use. But users quickly found

out that pens were often not the quickest or the most efficient way of controlling their palmtop computers or entering data into them. And the pen and handwriting recognition technology was often the weakest element in the system. Despite the technical achievement represented by the Apple Newton and the Casio/Tandy/AST Zoomer, none could recognise handwriting with anything approaching 90 percent accuracy.

In 1994, it was the turn of wireless communications to be the crucial element in the design of a PDA. Sony and Motorola weighed in with their respective Magic Link and Envoy systems and many other manufacturers talked about how crucial wireless communication would become for their PDA strategy. But the lack of a broad wireless communications infrastructure and the immaturity of standards for doing so have thus far made existing efforts somewhat disappointing. So, as we begin 1995 the buzzword is "K-PDA", coined by Sharp to describe its Zaurus "keyboard-enhanced PDA". While garnering a lot of press, some reviewers are questioning why you would put a keyboard on a PDA.

From where I sit, it all depends on what you want a PDA to do for you. I use my mine to take notes, to keep track of my invoicing, expenses, some of my business addresses and telephone numbers and many of my appointments. I use a keyboard to input all this data and find it difficult to believe that a palmtop computer with a keyboard is a new idea.

A system like the Series 3a is appropriate

technology for a certain class of applications and is extremely useful when used appropriately. Since I got the optional faxmodem to it, I have been able to fax notes to editors, send invoices, log onto CompuServe and my local Internet mail provider, and then read reams of online debate about how PDAs are a technology that is "not quite there".

The technology is here and now, so long as you don't expect it to start recognising your handwriting or have its applications controlled by an on-screen pen. Widespread wireless communication for handheld computers will arrive in due course and when it is fully debugged and properly supported it will no doubt be wonderful. For now, I am happy using good old wired technology. I am able to take almost 8,500 words of notes in an afternoon on a palmtop, turn that into a 1,000-word news story during a six-hour plane flight, and hook up the portable modem to send a story halfway around the world via Internet. You may not think it's much to ask of a palmtop, but it does the job for me.

As to whether it's a desktop replacement or will cause me to give up using notebook computers, the answer right now is a clear no. Today's palmtops cannot be all things to all users, and they probably never will be, but they should be credited with being able to do many jobs quite well, rather than being constantly slammed for the few jobs they can't do.

for other devices.

The Zaurus also supports Sharp's "Digital ASK" infra-red technology, which includes 115.2kb/sec IrDA-compatible and 19.2kb/sec ASK modes. Using this technology, you can use the Zaurus to exchange information wirelessly with infra-red equipped PCs, laptops, and other suitably equipped devices such as Newton-based PDAs and Sharp Wizards. With the right optional infra-red adaptors, Sharp promises you'll be able to beam information to PCs, Macs and PC printers.

The Zaurus operating system — dubbed Synergy by Sharp — is, as on most other PDAs, hidden from view. It tries to provide the standard interface elements that Windows and Macintosh users will find familiar, such as check boxes, radio buttons, scrollbars and pop-up menus, but sometimes fails to come up with as rich an environment as many Windows or Mac users would expect.

Synergy provides pen support, so pen-enabled features such as text

selection and drag and drop provide a quick way of getting things done. And the pen note-taking feature (using "ink" as a data type) provides a useful alternative to the keyboard. This is wise, since the keyboard is a little flat and its confusing key layout, with tiny backspace key and space bar, can make typing tough.

The software squeezes the most from the hardware. Drawings, for example, are stored as vector objects rather than bitmapped images, meaning that less memory is used per page. Notes can be displayed in a 50 percent reduced window while maintaining readability. Synergy is "datacentric" and can relate different types of information in a hyper-text kind of way, so Zaurus applications such as Activities, Contacts, Notes and Documents can interlink information automatically. This allows you to jump directly from one entry to another linked entry. While viewing a contact's information, for example, you can also see a list of all related entries, whether they be meetings past or upcoming, notes taken,

action items, or even letters written to that particular contact.

Other clever software tricks include automatic letter formatting in the Zaurus word processor, which is otherwise something of a letdown and falls far short of the one on the Psion Series 3a. To use the formatting you simply type in the main body of a letter, select a recipient, and the Zaurus will automatically fill in the heading and closing, insert the date, align and space paragraphs, and even insert your signature (which you can "sign" directly onto the screen). The word processor also has spell checking capabilities. Drawing application features are available for use from within other Zaurus applications such as Documents, Contacts and DataFiles. Maps, sketches, signatures, logos, and even company letterheads can be embedded.

In the US, the ZR-5000 Zaurus has a suggested retail price of \$749 for the base unit. The ZR-5000FX, which includes the CE-FM4 faxmodem, comes with a suggested retail price of \$849.

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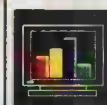
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#### MULTIMEDIA SYSTEMS

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| HP DeskJet 520   | 219  |
| HP DeskJet 540C  | 229  |
| HP DeskJet 560C  | 359  |
| HP DeskJet 1200C | 699  |
| CANON BJ10SX     | 159  |
| CANON BJ200EX    | 219  |
| CANON BJ230      | 259  |
| CANON BJ300      | 339  |
| CANON BJ330      | 429  |
| CANON BJC4000    | 259  |
| CANON BJC6000    | 369  |
| CANON BJC800     | 1139 |

### LASER PRINTERS

|                       |      |
|-----------------------|------|
| HP LaserJet 4L        | 419  |
| HP LaserJet 4+        | 1077 |
| HP LaserJet 4ML       | 799  |
| HP LaserJet 4M+       | 1369 |
| HP LaserJet 4MV       | 2149 |
| GENICOM 4PPM Laser    | 652  |
| GENICOM 8PPM Laser    | 911  |
| GENICOM 16PPM Laser   | 1797 |
| PANASONIC 4PPM LED    | 284  |
| PANASONIC 4PPM LED PS | 539  |
| PANASONIC 5PPM Laser  | 529  |
| PANASONIC 10PPM Laser | 775  |

### MEMORY

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| 1mb SIMMS (30 or 72 pin) From  | 29  |
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| 16mb SIMMS (30 or 72 pin) From | 349 |

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| TANDBERG 250MB Bare Drive          | 279  |
| TANDBERG 525MB Bare Drive          | 379  |
| TANDBERG 1.2GB Bare Drive 529      | 529  |
| TANDBERG Mini-Tape                 | CALL |

### MONITORS

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| ICL 14" SVGA                    | 199  |
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| ICL 17" SVGA                    | 499  |
| TRUST 14" SVGA                  | 129  |
| TRUST 14" SVGA Low Emission     | 149  |
| TRUST 15" SVGA                  | 199  |
| PANASONIC 15" FST SVGA          | 319  |
| PANASONIC 17" FST SVGA          | 449  |
| PANASONIC 20" FST SVGA          | 1099 |
| PANASONIC 21" FST SVGA          | 1329 |

### HARD DISKS

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|----------------------------|------|
| SEAGATE 420MB Fast IDE-ATA | 149  |
| SEAGATE 545MB Fast IDE-ATA | 199  |
| SEAGATE 545MB Fast SCSI-2  | 289  |
| SEAGATE 1GB Fast IDE-ATA   | 399  |
| SEAGATE 1GB Fast SCSI-2    | 486  |
| SEAGATE 9GB SCSI-2         | 2999 |

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| Soundblaster 16 Value Kit  | 199 |
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| Soundblaster 32 AWE  | 199 |

### UPS

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|-------------------------|-----|
| EMERSON PowerLite 250VA | 87. |
| EMERSON PowerLite 600VA | 194 |
| EMERSON Select 400VA    | 189 |
| EMERSON Select 600VA    | 229 |
| EMERSON Select 900VA    | 349 |

### SCANNERS

|                                   |     |
|-----------------------------------|-----|
| TRUST AMI 256 Grey Scale          | 39  |
| TRUST AMI 24bit Colour            | 85  |
| TRUST AMI 1200dpi Flatbed Colour  | 289 |
| TRUST AMI 2400dpi Flatbed Colour  | 399 |
| PANASONIC RX Flatbed 24bit Colour | 499 |

### MODEMS

See **THE MODEM SHOP** on opposite page for competitively priced modems - i.e. **V34 at £199.**

## PERSONAL COMPUTERS



|                             |      |
|-----------------------------|------|
| <b>COMPAQ</b>               |      |
| ProLinea 4/33SX,4m,200m     | 668  |
| ProLinea 4/50SX2,4m,200m    | 739  |
| ProLinea 4/66DX2,8m,200m    | 999  |
| ProLinea 4/100DX4,8m,200m   | 1099 |
| ProLinea MT 4/33SX,4m,270m  | 689  |
| ProLinea MT 4/50DX2,8m,420m | 999  |
| ProLinea MT 4/66DX2,4m,525m | 1149 |
| DeskPro XE 4/33SX,8m,170m   | 929  |
| DeskPro XE 4/66DX2,8m,270m  | 1099 |
| DeskPro XE P60,8m,270m      | 1359 |
| DeskPro XL 4/50DX2,8m,270m  | 1392 |
| DeskPro XL P60,8m,270m      | 1827 |
| DeskPro XL P90,8m,535m      | 2609 |

|                                |      |
|--------------------------------|------|
| ProSignia 300 4/75DX4,8m,1g,CD | 2669 |
| ProSignia 500 P90,16m,1g,CD    | 3429 |

|                                      |      |
|--------------------------------------|------|
| <b>ICL</b>                           |      |
| ValuePlus DLi 4/50SX2,4m,210m        | 639  |
| ValuePlus DLi 4/66DX2,4m,420m        | 849  |
| ValuePlus DLi 4/66DX2,4m,210m MM     | 899  |
| ValuePlus MD P60,8m,420m,PCI         | 1199 |
| ErgoPro XGi 4/66DX2,8m,270m,SCSI,LAN | 1299 |
| ErgoPro e P 4/33SX,4m,270m,LAN       | 899  |
| ErgoPro de P 4/50DX2,8m,270m,LAN     | 1099 |
| ErgoPro d P 4/66DX2,8m,270m          | 999  |
| ErgoPro P P60,8m,270m                | 1099 |
| ErgoPro P P90,8m,270m,PCI            | 1699 |

|                             |     |
|-----------------------------|-----|
| ErgoPro V C 4/33DX2,4m,210m | 699 |
| ErgoPro V C 4/66DX2,8m,210m | 799 |
| ErgoPro V C 4/50DX2,8m,420m | 799 |

|                                |      |
|--------------------------------|------|
| <b>APRICOT</b>                 |      |
| LS Pro 4/66DX2,4m,365m         | 1299 |
| LS Pro 4/100DX4,4m,365m        | 1459 |
| XEN PC 4/66DX2,4m,270m,14"     | 999  |
| XEN PC P60,8m,365m,14"         | 1499 |
| XEN PC P90,8m,365m,14"         | 1749 |
| XEN PCm 4/66DX2,4m,270m,CD,14" | 1399 |
| XEN PCm P60,8m,365m,CD,14"     | 1699 |
| XEN PCm P90,8m,730m,CD,14"     | 2499 |

## PORTABLE COMPUTERS



|                               |      |
|-------------------------------|------|
| <b>PANASONIC</b>              |      |
| CF-41 4/50DX2,4m,260m,CD STN  | 2439 |
| CF-41 4/50DX2,8m,260m,CD TFT  | 3139 |
| CF-41 4/100DX4,8m,450m,CD TFT | 4099 |

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| <b>TOSHIBA</b>                               |      |
| T1910 4/33SX,4m,200m STN M                   | 899  |
| T1910CS 4/33SX,4m,200m TFT                   | 1349 |
| T1950CT 4/40SL,4m,200m TFT                   | 1859 |
| <b>NEW</b> T2100CS 4/50DX2,4m,350m STN       | 1799 |
| <b>NEW</b> T2100CT 4/50DX2,8m,350m TFT       | 2629 |
| T3600CT 4/50DX2,8m,250m TFT                  | 2899 |
| T4700CT 4/50SL,8m,200m TFT                   | 2899 |
| <b>NEW</b> T2100CDS 4/75DX4,4m,260m, CD, STN | 2599 |

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|--|------|
| <b>NEW</b> T2150CDT 4/75DX4,8m,520m, CD, STN | 3899 |
| T4900CT P75,8m,772m TFT                      | 4999 |
| T6600C 4/66DX2,8m,510m TFT                   | 4699 |

|                                  |      |
|----------------------------------|------|
| <b>ICL</b>                       |      |
| ErgoLITE 4/33SX,4m,210m Col      | 1399 |
| ErgoLITE 4/50DX2,8m,210m Col     | 1499 |
| ErgoLITE 4/75DX4,8m,210m Col     | 2399 |
| ErgoLITE Sub 4/33SX,4m,260m Mono | 799  |
| ErgoLITE Sub 4/33SX,4m,260m Col  | 1199 |

|                           |      |
|---------------------------|------|
| <b>CANON</b>              |      |
| BN100C 4/25SX,4m,120m Col | 1494 |
| BN120C 4/33SX,4m,200m Col | 1999 |

|                         |      |
|-------------------------|------|
| BN32 4/50SL,4m,130m Col | 2699 |
|-------------------------|------|

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|--|------|
| <b>COMPAQ</b>                          |      |
| AERO 4/33SX,4m,170m STN                | 1099 |
| CONTURA 410 4/50DX2,4m,250m STN M 1274 |      |
| CONTURA 410 4/50DX2,4m,350m STN        | 1694 |
| CONTURA 410 4/50DX2,4m,350m TFT        | 2214 |
| ELITE 4/50DX2,4m,250m TFT M            | 1999 |
| ELITE 4/40DX2,4m,170m STN              | 1899 |
| ELITE 4/40DX2,8m,170m TFT              | 2199 |
| ELITE 4/50DX2,8m,340m TFT              | 2799 |
| ELITE 4/75DX4,8m,340m TFT              | 3199 |

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|---------------------------------------|-----|
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| ZDX V34 Fax/Modem                     | 184 |
| 1432 V32 bis, Dial Up, LL, Sync/Async | 366 |
| 2834 V34 Dial Up, LL, Sync/Async      | 457 |

|                              |     |
|------------------------------|-----|
| 1432 PCMCIA V32bis Fax/Modem | 207 |
| High Speed PC Serial Port    | 49  |

#### Psion Dacom

|                                   |     |
|-----------------------------------|-----|
| PCMCIA V.34 28.8k Fax/Modem       | 317 |
| PCMCIA V32bis Gold Card Fax/Modem | 201 |
| PCMCIA To ISA Card                | 90  |
| Meteor 144 V32bis Fax/Modem       | 232 |
| Meteor 288 VFC Fax/Modem          | 249 |

#### Trust

|                                  |     |
|----------------------------------|-----|
| AC1414 V32bis Internal Fax/Modem | 92  |
| AE1414 V32bis External Fax/Modem | 105 |

#### Cray Communications

|                                    |     |
|------------------------------------|-----|
| QSM288 V34 Dial-up, LL, Sync/Async | 585 |
|------------------------------------|-----|

|                                       |     |
|---------------------------------------|-----|
| QSM144 V32bis Dial-Up, LL, Sync/Async | 526 |
| QAM144 V32bis Fax/Modem               | 206 |
| QAM288 V34 Fax/Modem                  | 278 |
| Quattro PCMCIA V32bis Fax/Modem       | 206 |
| Quattro PCMCIA V34 Fax/Modem          | 278 |

#### Modular Technology

|                                   |     |
|-----------------------------------|-----|
| M5132 V32bis External Fax/Modem   | 119 |
| M5132PC V32bis Internal Fax/Modem | 119 |
| M5132LT PCMCIA V32bis Fax/Modem   | 132 |
| M5134 V34 External Fax/Modem      | 199 |
| M5134PC V34 Internal Fax/Modem    | 199 |
| M5134LT PCMCIA V34 Fax/Modem      | 199 |

V32=9600bps V32bis=14400bps V34=28800bps

### LAN/WAN COMMUNICATIONS



#### ETHERNET ADAPTERS

|                           |     |
|---------------------------|-----|
| Cogent E-Master           |     |
| PCI UTP (Full Duplex)     | 106 |
| PCI UTP/AUI/BNC           | 88  |
| PCI Quartet UTP (4 X UTP) | 346 |
| PCI Quartet BNC (4 X BNC) | 387 |

#### 3COM EtherLink III

|                             |     |
|-----------------------------|-----|
| 590B ISA BNC/AUI            | 71  |
| 590B ISA UTP/AUI            | 69  |
| 590B ISA UTP                | 66  |
| 590B ISA UTP/AUI/BNC        | 79  |
| 590B ISA BNC/AUI 5 pack     | 315 |
| 590B ISA UTP/AUI 5 pack     | 297 |
| 590B ISA UTP 5 pack         | 278 |
| 590B ISA UTP/AUI/BNC 5 pack | 344 |
| 589B PCMCIA UTP             | 109 |
| 589B PCMCIA UTP/BNC         | 139 |
| 589 PCMCIA UTP 5 pack       | 520 |
| 589 PCMCIA UTP/BNC 5 pack   | 664 |

#### Allied Telesyn

|                                  |     |
|----------------------------------|-----|
| AT-1500T+ ISA UTP NE2100 compat  | 56  |
| AT-1500T+ 5 pack                 | 247 |
| AT-1500AT+ AUI/UTP NE2100 compat | 70  |

|                                  |     |
|----------------------------------|-----|
| AT-1500AT+ 5 pack                | 312 |
| AT-1500BT+ UTP/BNC NE2100 compat | 70  |
| AT-1500BT+ 5 pack                | 312 |

#### Cray Communication

|                              |     |
|------------------------------|-----|
| ISA UTP/BNC NE2000 compat    | 52  |
| ISA UTP/BNC 5 pack           | 246 |
| Pocket Parallel Port UTP/BNC | 94  |
| PCI UTP/BNC                  | 146 |

#### Trust Range

|                           |     |
|---------------------------|-----|
| PCMCIA UTP/BNC            | 105 |
| ISA UTP/BNC NE2000 compat | 39  |
| ISA BNC NE2000 compat     | 27  |
| Pocket Parallel UTP/BNC   | 60  |

#### TRANSCIEVERS & REPEATERS

|                                     |     |
|-------------------------------------|-----|
| Allied Telesyn                      |     |
| AT-MX10 BNC Micro Transceiver       | 24  |
| AT-MX10S Slim BNC Micro Transceiver | 24  |
| AT-210T UTP Micro Transceiver       | 24  |
| AT-210TS Slim Line UTP Transceiver  | 24  |
| AT-MR111T AUI to UTP Micro Repeater | 182 |
| AT-MR112T BNC to UTP Micro Repeater | 182 |
| AT-MR113 AUI to AUI Micro Repeater  | 253 |
| AT-MR114 AUI to BNC Micro Repeater  | 253 |
| AT-MR115 BNC to BNC Micro Repeater  | 301 |

#### Trust

|  |     |
|--|-----|
| 2 Port BNC/AUI to BNC/AUI Micro Repeater | 112 |
| 6 Port (4 BNC/2 AUI) Repeater            | 234 |

#### HUBS

|                 |     |
|-----------------|-----|
| 3Com FMS II     |     |
| 12 Port UTP Hub | 374 |

|                            |      |
|----------------------------|------|
| 24 Port UTP Hub            | 658  |
| 6 Port Link/Switch UTP Hub | 3692 |
| SNMP Management Card       | 297  |
| Local Bridge Module        | 319  |
| Hub Expansion cable        | 25   |
| 48 Port Managed Hub Bundle | 1401 |

#### Allied Telesyn

|                                    |     |
|------------------------------------|-----|
| AT-3012T 12 Port UTP Unmanaged Hub | 282 |
| AT-MR420T 4 Port UTP Hub           | 141 |
| AT-MR860T 8 Port UTP Hub           | 149 |
| AT-3608 8 Port BNC Stackable Hub   | 927 |

#### Cray Communications

|                                    |     |
|------------------------------------|-----|
| 8 Port UTP/1 BNC Unmanaged Hub     | 141 |
| 16 Port UTP/1BNC/AUI Unmanaged Hub | 264 |
| 12 Port UTP Stackable Hub          | 423 |

#### Trust

|                       |     |
|-----------------------|-----|
| 8 Port UTP Smart Hub  | 119 |
| 16 Port UTP Smart Hub | 207 |

#### Hewlett Packard

|                 |      |
|-----------------|------|
| 24 Port UTP Hub | 609  |
| 48 Port UTP Hub | 1139 |

#### ETHERNET BRIDGES

|                             |      |
|-----------------------------|------|
| Gandalf LanLine             |      |
| 5210 Micro Bridge           | 221  |
| 5211 Unmanaged Local Bridge | 426  |
| 5220L Local Managed Bridge  | 601  |
| 5220e Remote Managed Bridge | 966  |
| 5240i Remote ISDN Bridge    | 1216 |

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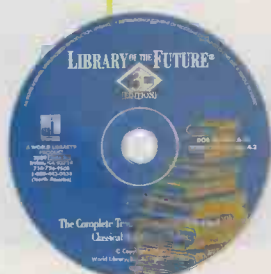
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- 5 2 8 **Focus** — Wendy M Grossman quizzes Conservative, Labour and the Lib Dems about their attitude towards the Information Superhighway.
- 5 3 2 **net.answers** — The best way for remote offices to keep in touch, and how to publicise your Web pages.
- 5 3 4 **net.surf** — Some new sources of news online, all the television show news you could want, distributing music and books across the Internet, and resources for kids.
- 5 3 8 **net.news** — Some new uses for the Internet begin to emerge and new developments from CompuServe, Delphi and UK Online all jostle for attention.
- 5 4 2 **net.comms** — Do you need to worry about security if you are only dialling in to the Internet occasionally? Quite possibly, says Stephen Cobb.
- 5 5 0 **net.newbies** — Some net.knowledge for those new to the Internet.

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# The new party line

**With Britain's three major political parties now online, Wendy M Grossman looks at the different ways in which they are embracing the new technology, and how this will benefit the voter.**

It's hard to tell whether it's good or bad news that British politicians have noticed the Internet. On the one hand, building the infrastructure for a national (or international) information superhighway is the kind of large project that requires government interest; on the other, most cyber-citizens dread the day politicians and other regulators stomp on the cherished "anything goes" spirit of the Net. But the day is here: all three parties either have developed, or are developing, policies.

There are two main policy areas. First, and most talked about, is the building of what will be the information superhighway. Many people confuse this with the network we have now, the Internet, but the politicians don't seem to: they know they're talking about a national, broadband network with the capacity to carry full-motion video and offer a range of services that can only be guessed at but are imagined to include things like home shopping and banking, and video on demand. If their ideas about what could be done with such a network are limited, it's probably because so few of them have experience in the second main policy area: the Internet and its short-term use, particularly in the matter of opening direct access to UK government information and politicians.

## Conservative

**Current activities:** Building a Web server index and search

engine to facilitate access to the departmental Web servers expected to be in place by the end of the year. The party does not (yet) use the Net for its own purposes.

**People:** Robert Hughes, junior minister for science and public services.

**Street cred:** Hughes doesn't seem to have much hands-on experience but has lots of interest, curiosity, and willingness to learn; admits to reading *PCW* (sometimes). Other Conservative MPs have moved onto the Net, to learn about it and to handle constituency correspondence, including David Shaw, who was the first MP known to get wired, and Sir George Young.

Robert Hughes likes to point out Britain's strengths: SuperJANET, the recently upgraded academic network, is, he says, the fastest network in the world, capable of speeds up to 155Mbit/sec. He quotes an estimate that 33 percent of the world's optical fibre networking is in Britain.

Also, he defends the government's rejection of the DTI Select Committee's recommendation that the ban on BT's offering information services be lifted. His reasoning is that the cable companies were guaranteed a time period in which they could recoup the money they've spent installing their networks. "To take away the guarantee they have of where they're able to make that money would be a disgraceful stabbing in the back. No-one



*Graham Allen, MP, is active in Labour's policy forum addressing the opposition's online presence, due to report in May. In our interview, he couldn't remember his own email address*

would ever believe what we said in that area again."

In the end, Hughes believes we will cease to make the distinction between cable and telephone companies: there will simply be a couple of companies offering telecommunications and information services. At the moment, he says, there's no requirement that the cable companies allow local access. In the US, cable companies have to create opportunities for local broadcasting in return for their franchises. "That doesn't mean there won't be in future," he adds.

Hughes's main responsibility is in delivering public information. Recent initiatives include the setting up of the government's central Web server and the publication of last autumn's Budget. Comprehensive free access, however, is something he has trouble with.

"It is a problem for us because we have gone down the road of selling that government information, after it had cost the taxpayer a great deal of money to put the information together. It's not unreasonable that those who want that information should pay for at least



some of it." Publications like Hansard, Hughes says, are priced according to the costs of distribution and production; libraries do get subsidies to help them buy it. On top of that, government agencies depend on the money raised by selling their reports.

However, Hughes says this is an area where "we're consulting very widely both inside government departments and with consultative open groups". One option that interests him is making partial information available free. He uses the example of weather maps, which are expensive to produce. Perhaps the outlines could be distributed free over the Internet, but people would still have to pay for the detailed versions.

Similar considerations rule the publication of scientific research, government surveys and other material. The government expects to announce its strategy in this area in April this year.

There are other initiatives, too, aimed at taking advantage of the technology we have now (as opposed to what might be built in the future). Hughes mentions a joint project with the Benefits Agency and IBM, called MINK, which is currently under trial in Bournemouth. This is essentially a public kiosk with a touch screen; version two, which is currently being built, will incorporate Internet access and a smart card reader. The idea is that situating these in public places such as libraries will give people access to personal and worldwide information services. At the same time, SuperJANET is being piped into Whitehall to give all offices access to the Internet, plus video-conferencing facilities.

Mark Gladwyn, head of the Strategic Programmes division at the CCTA, is involved in implementing systems like the Open Government Web server. He says that until now, while email is used extensively within departments, there has been no email linkage between them, partly for security reasons. But now, people realise

that public email would benefit everyone.

"The problem we've got with it is partly ignorance, which brings fear," says Gladwyn; particularly, he says, fear of generating large volumes of correspondence with no way to handle it. However: "Set against that is the recognition of people like David Shaw that this is really very useful stuff."

In the short term, he says, the plan is to move to using electronic communications for procurement, starting, naturally, with the IT companies.

### Labour

**Current activities:** Policy forum launched at the end of February, due to report in late May/early June. Also using Web server to present party policies.

**People:** Chris Smith, shadow heritage secretary; Graham Allen, shadow minister for media, broadcasting and the information superhighway; Anne Campbell, MP for Cambridge; Jack Cunningham, shadow trade and industry secretary.

**Key policy points:** Nationwide, universal access; infrastructure to be built with private money; lower the bar on BT's offering information services.

**Street cred:** Varies. Anne Campbell is the most wired MP in Parliament. She claims to have more than 20,000 constituents online in her Cambridge constituency although she has an advantage, of course, in that Cambridge has such a high concentration of technology companies and research facilities (see PCW January '94). She also uses email personally, to keep in touch with her husband when one or the other is travelling. Graham Allen could not remember his email address. A look of faint horror crossed his face when asked if he answered his own email. His reply: "No."

In mid-February, Labour launched a policy forum on the information superhighway, which is due to report at the end of May. The timing has been chosen so that its report can go through the party's

consultation procedures in time for the annual Party Conference, scheduled for October.

Divided into four subgroups, the forum is chaired by Chris Smith, the shadow heritage secretary. Also on the forum are Graham Allen, shadow minister for media, broadcasting and the information superhighway; and Jack Cunningham, shadow trade and industry secretary. The four subgroups cover infrastructure, network content, demand for services, and education and research. Anne Campbell will be serving in this last group.

Much of Labour's concern focuses on the building and infrastructure of the information superhighway itself. Labour hopes it will be built by the collaborative efforts of BT and the cable companies. Smith criticises the Conservatives for rejecting the DTI Select Committee report which recommended lifting the bar on BT's offering information services. If — or, in Smith's and Cunningham's parlance, when — Labour comes to power, this decision would be reviewed then.

The policy forum was launched with a list of objectives: economic growth; equality of access through an integrated national network; the use of the superhighway to offer new opportunities in education, training, and research; social benefits in the form of improvements in the delivery of healthcare and social services; cultural life — that is, the creation of new opportunities for film, television, publishing and music; freedom of information; and public awareness. Both Smith and Cunningham stressed the importance of equal access, so that the UK ends up with a truly nationwide network.

Exactly how they would do this isn't clear, but Smith quoted a New York initiative where companies cabling wealthy areas are required to pay into a common fund earmarked for cabling deprived areas. How schools, hospitals and libraries would pay for the

hardware and software necessary to hook them to the network is not clear.

One of the guidelines for the Policy Forum is that the superhighway should be used to make the government more accessible. Asked about the control of information flow over the networks we have now, Cunningham said he thought the best way forward was through international agreements. "This is one of the items that ought to be on the agenda at the G7 meeting on 26th and 27th February."

In Cunningham's opinion, there are "a very limited number of things we'd want to circumscribe. The basic principle is absolutely right, which is that it is a free area of any information that anyone wants to provide."

A hands-on view comes from Anne Campbell, who started communicating electronically with constituents in mid-1994 and is chairing the forum's education and research subgroup. Campbell says that 10 percent of her constituents' correspondence is by email. But, she says: "If 20,000 constituents have email, it follows that 50,000 don't. We're anxious that people shouldn't jump the queue." This means adopting low-tech methods for dealing with email, printing it out, and cycling it through the in-basket along with other types of correspondence. That in turn probably means implementing some kind of auto-response mechanism, since electronic correspondents tend to expect a quick response. A local project seeks to link county and city councils, the CAB, hospitals and bus companies, to provide an integrated information service with public access points.

Campbell also uses the newsgroups — she mentions in particular `cam.misc` — although she tries to avoid getting into arguments with other MPs. "What seems valuable is not to hear MPs slagging each other off over the Net, but using the medium to get comments and queries from constituents in an informal way."



**Liberal Democrats**

**Current activities:** The party leader uses CIX for conferencing and email; for example, he uses email to keep in touch with his office when he's travelling. Other members are said to be interested in and actively exploring the Net and its resources. Also uses a Web server to present Party policies.

**People:** Paddy Ashdown.

**Key policy points:** Competition rather than regulation, equal access nationwide.

**Street cred:** Ashdown answers as much of his email personally as he can. He further bolstered his reputation as a Net-head by logging onto CIX while waiting for the interview to begin.

Ashdown calls himself a "computer nut". His wife gave him his first computer 12 years ago, and during a break in the interview he went to check on his defragmenting HP 200LX.

"The most depressing thing you now find," he says, "is they're digging up roads and disturbing communities in Britain in order to put down coaxial cable. What a crazy thing. Here you are: you could not have a clearer idea of how this government views information technology than the idea that we should disrupt whole communities in our country and put down technology that was designed to send repeats of Coronation Street."

Ashdown sees two ways the superhighway could go. "Way one: the government can know all about us all the time and everything we do. We're very close to that, if you lock together the databases now in existence." He lists some of these: tax, gas, water, electricity board. "The other way is that we have a capacity for every single one of us to have access to all the information in the whole world. It is pretty inevitable, given the nature of politics and its desire to use power for itself, that the tendency will be to go the first route. We've got to make it go the second."

As for building this route,

Ashdown believes the government's role should be to maintain a competitive market while ensuring that all areas of the country get access, as well as setting standards.

When it comes to questionable material, he says: "In principle, I think the government has a role. It's part of its policing role. But it's very difficult to see how to do it except by some international group." He does, however, accept the notion of the cyberspace equivalent of private members' clubs.

"What a group of consenting adults do in private, by and large — as long as they're not making bombs — the government should keep out of. There's a fundamental difference between a group of adults coming together, whether on the Internet or in person, to talk, discuss and do things, and doing things which frighten the horses because they're out in public."

To put Ashdown's comments in context, Liberal

Democrat policy calls for, first of all, devolving power away from national government and into the regions. Accordingly, Nigel Jones, the party's spokesman on science and technology, has said in his January 1995 policy discussion paper that "access is the single most important issue surrounding new technology".

This covers a broad range. Encouraging cable operators to carry local services, something so far missing in the UK, is one of his examples. In a topical paper released in November 1994, the party has also proposed such measures as supporting the information superhighway by subsidising hardware purchases throughout the public sector and expanding optical fibre links between households, schools, libraries, hospitals, and other public bodies. The same paper deplores the cuts in funding for scientific research, and calls for increased funding.

One final comment. Ashdown follows up with the

observation that while specifically national institutions are dying, multinational ones like the foreign currency markets, huge corporations and, of course, the Internet, are growing wildly. Some of these, he believes, need to be brought under democratic control — not enough people talk about the amoral power of, say, young men working at computer screens in stock exchanges from Tokyo to New York to bring down the economies of small countries.

Of the Internet, Ashdown says: "I'm hugely excited, but like anything powerful it will be dangerous. Its capacity to be misused will be huge. Its capacity to build power bases and powerful people will be enormous. And the only thing I think you can't do about it is ignore it, and that's what 90 percent of this place [Westminster] is dedicated to."

*• As we went to press, we heard the news that Robert Hughes had resigned.*

### The Best Party In Town

Point your Web browser at <http://www.open.gov.uk> as your starting point for government information on the Net. In mid-February, an experimental version of the search engine that will eventually span all government departments was already up and running. It's impressive, too (assuming your Web browser supports Forms): you can select which indexes to search — enter a word or phrase and it displays the results with remarkable speed. The service also includes email feedback.

There are instructions for joining the collaborative open groups (COGs) on the server, too. These cover areas like legal issues, open government, security, local government, Europe, disability, education, policy, usability, ethics and so on. Each one has an associated mailing list to which anyone can subscribe and contribute. Usage statistics are posted on the server; the week of 5th February 1995 there were more than 34,000 accesses.

On top of this, the BBC2 programme Westminster Online, which goes out at the Net-unfriendly hour of 8.15am, Monday to Thursday, accepts questions via telephone, videophone, fax, email, and even Internet Relay Chat, which may be a world first. For more information via the Web: <http://www.bbc.co.uk/westonline>. Email to: [westonline@bbc.co.uk](mailto:westonline@bbc.co.uk). To join in via IRC, telnet to

<irc:demon.co.uk> (or another IRC client) and join #westonline. To ask questions via IRC, join #westpublic.

For political discussion, try the following Usenet newsgroups: [uk.politics](mailto:uk.politics), [uk.misc](mailto:uk.misc), and [alt.politics.british](mailto:alt.politics.british). On CompuServe some discussion goes on in the UK Forum (GO UKFORUM); on CIX there are too many to list (but try times, politics, abuse, and even xian).

Your friendly MPs on the Internet are:

- Paddy Ashdown: [paddyashdown@cix.compulink.co.uk](mailto:paddyashdown@cix.compulink.co.uk)
- Anne Campbell: [Anne.Campbell.MP@solo.pipex.com](mailto:Anne.Campbell.MP@solo.pipex.com)
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- Sir George Young: [cyclebart@arcglade.demon.co.uk](mailto:cyclebart@arcglade.demon.co.uk)

A regularly updated list is maintained on the following Web server (the personal site of the Guardian Online's Azeem Azhar): <http://www.gold.net/arcadia/azeem> (under "places"). From his site, you can email any of the listed MPs.

- Labour web server: <http://www.poptel.org.uk/labour-party/>
- Liberal Democrat web server: <http://www.compulink.co.uk/libdems/welcome.htm>



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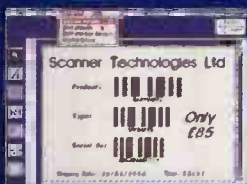
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# net.answers

## How it's done

**Q.** I operate a small import/export firm based in Coventry but with a few individual representatives in the United States and Canada. Each month we seem to spend more money on transatlantic phone calls, including voice, fax, and data (we transmit inventory lists by modem as data files). We have been thinking of trying email since we already have 14.4kb/sec modems at each location, but none of us are particularly comms-literate.

What would you recommend, and how would it work? Would an Internet account be suitable and would we need dedicated modem lines?

**A.** My recommendation for an email service, based on the circumstances you outline, is CompuServe. It is reliable, widely available, easy to use, and less expensive now than at any time in the past. Your modem calls would be at local rates. By using a third party like CompuServe you can send and receive messages at any time and you do not need a dedicated line. Messages you send simply sit on the CompuServe computer until the recipient collects them, which is particularly handy when you are dealing with people in different time zones.

CompuServe is decidedly easier to set up than an Internet connection, while at the same time offers access that is broader and possibly cheaper. For example, your overseas reps can probably connect to CompuServe with a local call just like you can in Coventry. They will find local access points all over North America, Europe, and even a sprinkling in the Far East.

For the moment most Internet accounts are location-dependent. Although you can

use an Internet connection to visit computer sites all over the world, your account is based at a computer in a single location. Even though Internet providers such as Demon are steadily increasing the number of different cities from which you can connect with a local call, they are not really in the business of offering worldwide local access in the same way that CompuServe does. Besides, CompuServe itself allows you to connect to the Internet and you can send and receive mail from Internet users. In that sense, CompuServe is an integral part of the information superhighway.

Here's how your email would work:

1. Both you and your reps would sign up for your own CompuServe accounts. This is relatively inexpensive and sometimes an "introductory offer" comes with modems, magazines, and so on.
2. To access CompuServe you install a piece of software called CompuServe Information Manager (CIM), which comes in three flavours — DOS, Windows and Mac. All three are easy to use and very similar in operation.
3. To send email you load CIM, but you won't go online until you have written the message. To write a message you select Create Mail from the Mail menu and choose the recipient from an address book that automatically appears. When you have typed the message, you click a button to store it in the out-basket.
4. You can write numerous messages like this and then select "Send/Receive All Mail". This command calls the local CompuServe number (you can store several different numbers for use in

different locations, which is handy when you are travelling with your laptop). When the connection is made with the CompuServe computer, the CIM program checks to see if there is any mail waiting for you. If there is, the messages are copied from their computer to yours. All the mail you have stored in your out-basket is copied to the CompuServe computer, where it stays until the recipients call in to check their mail.

5. The Send/Receive All command automatically disconnects you from CompuServe, thus minimising the phone costs. When you are offline you can open the in-basket and read your mail. The mail reader has a Reply button which will automatically address a reply for you (addresses consist of a person's name and CompuServe number, as in Stephen Cobb 72662,546). You can also click a button to transfer the name and number to your CompuServe address book.
6. When you have written a reply it goes in the out-basket until the next time you connect. Not only does the CIM software keep track of your incoming mail, it will also keep copies of all your old outgoing messages, which can be very handy on those occasions when you have forgotten exactly what you said.

As far as the modems and phone lines are concerned, CompuServe would work very well with the modems you have. You should be able to connect at 14.4kb/sec in major American cities and there is an 800 number running at 14.4kb/sec that works from anywhere in America (there is a small surcharge for using it). In Coventry there is a 9600bps number provided by Mercury (you don't have to be a Mercury customer to use the number).

In fact, message traffic does not impose a big strain on modems, so you will find it only takes a minute or two to

handle a couple of in/out messages. Of course, there is a lot more you can do on CompuServe, but that's a another story. Since connect time purely for email is relatively short, you can use it on just about any phone line since you will not be tying the line up for long. You can use it from home without much trouble and without installing a second line.

The only possible snag is someone else picking up the handset of another phone that is on the same line. The answer to this is three-fold. First, give a loud verbal "hands-off" message to all members of the household when you are about to go online. Second, let everyone know that if they do pick up the handset and get a fuzzy modem sound, they should not hang up but just set the handset down. The call will not be interrupted. Third, connect a little grey box to each of the phones in the house that share the modem line. This box (a few dollars from Radio Shack in the US) will prevent the other phones being used when someone is on the modem line (it works with faxes and voice phones as well).

You can also plug a fax and modem into the same line. The modem will not answer the phone unless you specifically program it to do so, so there should be no conflict between the two machines. Your people in the US will have to watch out for call waiting, which will interrupt a modem call. All you do is precede the CompuServe phone number with \*70, which disables call-waiting during that call.

All the phone number and password information is stored in the CIM program so you don't have to remember it from session to session. Once you have things set up, it really is just a matter of clicking a few buttons.

**Stephen Cobb**



## Where To Post

## Global

<http://akebono.stanford.edu/yahoo/bin/add> (Yahoo — the single most useful general index on the Web)  
<http://gnn.com/gnn/wn/whats-new-form.html> (What's New pages)  
<http://www.yellow.com/cgi-bin/online> (World Wide Yellow Pages — you can also add yourself even if you aren't online)  
<http://www.directory.net/dir/submit.cgi> (Open Market Commercial Sites index)  
<http://galaxy.einet.net/annotate-help.html> (EINet Galaxy — an index of Web sites, but also Internet services of all kinds)  
[http://www.w3.org/hypertext/DataSources/WWW/Geographical\\_generation/new-servers.html](http://www.w3.org/hypertext/DataSources/WWW/Geographical_generation/new-servers.html) (Indexes by country and by subject)  
[www.announce@info.cern.ch](http://www.announce@info.cern.ch)  
[net-happenings@is.internic.net](http://net-happenings@is.internic.net)

## Predominantly UK/European

<http://www.cityscape.co.uk/gold/gold2.html> (for companies and organisations)  
<http://src.doc.ic.ac.uk/cgi-bin/alluk-request.cgi> (for new UK servers only)  
<http://web.city.ac.uk/citylive/newpages.html> (Who's Who on the Internet — mostly non-commercial)  
<http://www.demon.co.uk:80/milfac/mfaq.html> (Millennium's Internet Digipages)  
[hi@u-net.com](mailto:hi@u-net.com) (UK Commercial WWW pages)

## Add to Yahoo

Top Skip Search Mail Add Help

If you have URLs that you like to see in our hostlist, please fill in the form below. This form is for adding URLs only. To send comments to Yahoo, use the form.

We ask you to check first whether your URL is already in Yahoo. The easiest way is to do a search on the URL you want to submit. If it doesn't exist, or if it is incorrectly entered in Yahoo, please let us know below.

Please check our recommended submission suggestions before doing an Add.

Once you have submitted the URL, we will verify it, and find the best place for it in the hierarchy. We will try to notify you via email when the entry has been added.

You may also suggest change the category from the default.

Category:   
 Title:   
 URL:

The easy-to-use form to fill out which registers your net pages on the most popular index

need do is amend the existing details.

See panel alongside for a short list of places to post (partly compiled by glenn@popco.com).

You can also post to the newsgroups most appropriate to the business you are in (but *only* to those newsgroups — post in others and you could attract considerable hostility). There are newsgroups dedicated to listing new resources, notably comp.infosystems.announce, alt.internet.services and biz.misc.

If you don't mind spending a little money to save yourself a lot of time, mail Netpost@netpost.com. This company charges from \$150 to \$750 to produce an appropriate listing and post it in the right places. Seems like a lot, but a badly worded posting could cost you much more in lost goodwill.

David Brake

## Spreading the word

**Q.** I have created a Web page for my business. How can I make sure everyone on the Internet knows about it?

**A.** This is a tough one. There are a few automatic "Web crawlers" which may stumble across and index your Web site, but it's quite possible they could miss it altogether, and not everyone knows where they are and how to use them to search for your company. There are also hand-crafted indexes devoted to individual subjects, but unfortunately there isn't an overall structure so there's no easy way to find all the ones you need to register with.

Keep your announcement short, descriptive and hype-free. If you describe your site as "terrific" and your products as "once in a lifetime buys", the best that will happen is that the adjectives will be edited out; the worst is that the busy administrators of these sites won't bother to list it at all. It's also worth checking to see if the index already contains a mention of your company — someone else or an automatic search engine may already have found you, in which case all you

## PCW Contacts

If you've got the questions, we've got the answers. Just drop me (David Brake) a line at [derb@pcw.cityscape.co.uk](mailto:derb@pcw.cityscape.co.uk) or by post and I'll try to sort you out. Anyone whose letter we use will receive a copy of the second edition of Ed Krol's bestselling *Whole Internet User's Guide and Catalog*, which is published by O'Reilly and distributed here by International Thompson Publishing.

GET ON-LINE TO

## Internet

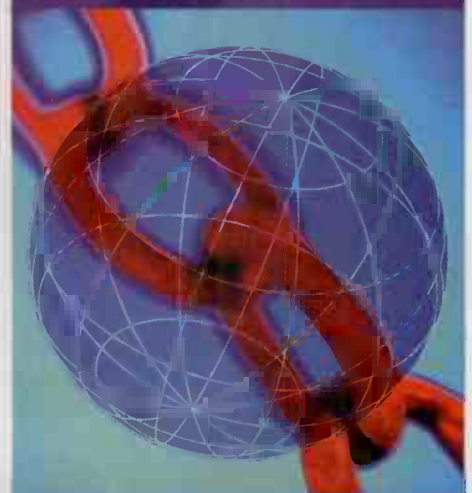
WITH



THE ESSENTIAL CONNECTION

Now it's easy to connect to the biggest network in the world, with Direct Connection, giving you access to a range of databases, the biggest bulletin board in the world, and thousands of **free** programs.

- Full Internet Connectivity
- Global Electronic Mail
- Usenet Discussion Groups
- 1,000's of Databases
- 24hr Computer Newswire
- TCP/IP & UUCP available
- Menu or "shell" access
- Widest range of dial-up Internet Services



## Direct Connection

Free Demonstration (modem)

0181 317 2222

Helpdesk (voice) 0181 317 0100

The Direct Connection  
 FREEPOST (LON 1107)  
 London SE18 3BR



# net.surf

Here is the news

The Wall Street Journal is at the heart of three separate approaches to providing personalised news and financial data online. The Wall Street Journal Personal Edition, published by Dow Jones Business Information Services, is available now, but initially only in the US as it depends on a direct modem connection to sites across the country.

It is based on a Windows package and loosely resembles a conventional newspaper page on screen, but subscribers will be able to choose the areas they are interested in and only download stories relevant to them and their business. As well as news, it will offer a Personal Portfolio which can keep track of up to 25 investments, sports, global weather and advertising — charter

advertisers include Hewlett Packard. It will cost subscribers \$12.95 per month for a daily subscription, plus 50 cents for each update.

For some months, Dow Jones has had a Web site on test at <http://dowvision.wais.net/> which offers a more conventional news database, allowing users to find articles from a variety of sources including the Wall Street Journals in Asia and Europe, press release wires, and the Dow Jones News Service. Unlike the WSJ Personal Edition, the DowVision service requires users to type in keywords to search the database, and it doesn't resemble a conventional newspaper in layout. At press time it was free to beta testers but it is expected to cost around \$30 a month to use when it is

## InfoSeek Query

[Click here for helpful information and examples.](#)

Enter words and phrases likely to appear in documents you seek:

Run Query

Clear Query Text and Reset Collection

Select the box to the left of the Collection you wish to search. If no box is selected, we'll search the Collection you previously searched.

### Collections with Free Document Retrievals

- ☒ WWW Pages ([info](#))
- ☐ InfoSeek Help (Frequently Asked Questions) ([info](#)) free queries!

### Standard Collections

- ☐ Computerworld ([info](#))
- ☐ Usenet News (current week): Feb 12 - Feb 18 ([info](#))
- ☐ Usenet News (current 4 weeks): Jan 22 - Feb 18 ([info](#))
- ☐ Newsbytes International Computing Industry News ([info](#))
- ☐ Cineman Movie, Book and Music Reviews ([info](#))
- ☐ FrameMaker 4.0 Help Notes ([info](#))
- ☐ Hoover's Master List ([info](#))

### Premium Collections

- ☐ Computer Select (online version) ([info](#))
- ☐ InfoWorld ([info](#))

InfoSeek is one of the first consumer search engines on the Web to charge for access

## What the Papers Say

Internet Edition

Eight pages  
© 1995 The New York Times

**TimesFax**  
The New York Times

TimesFax Internet Edition is an electronically delivered version of TimesFax, the digest of The New York Times sent daily to over 150,000 readers around the world.

Corresponding to the first edition of The Times, TimesFax provides a condensed version of the newspaper, including stories from the front page and business section, the top foreign and national stories of the day, as well as sports, a recent NYT crossword puzzle and selections from the Times's editorial and Op-Ed pages.

Designed to give the reader the look and feel of a newspaper, TimesFax is in column form, eight pages.

Page One - New York Times front page stories.

Page Two - International

Page Three - National

Page Four - Business\*

Page Five - Business

Page Six - Crossword puzzle/features

Page Seven - Sports

Page Eight - Editorial Commentary

\*On Sundays, Page Four substitutes selections from the Sunday Times's Arts & Leisure section.

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ADVANCED MEDICINE  
FOR YOU

For health tips return to the bottom of the TimesFax homepage page and

look for the Advis Pak.

**AMA**  
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If you prefer the New York Times to the Wall Street Journal, a free eight-page digest is available in Acrobat format from the Web at <http://nytimesfax.com/>

launched, and since it is on the Internet, it is available to users across the world.

More recently, DowVision has licensed a package called Relevant from Ensemble which works in a similar manner to Personal Edition and which it intends to bundle with

its subscription. Relevant is a Windows application which users can customise and which connects across the Internet to DowVision's database, bringing across a "snapshot" of relevant information and importing it to a newspaper-like format.

## NYPD Blue



Welcome to the NYPD Blue home page. This page contains links to all the NYPD Blue files stored on the Tardis archive, as well as other sources of information.

### Text Files

- [NYPDBlue](#) - Dave Chapman's Episode Guide.
- [NYPDBlue.dk](#) - Dennis J. Kyriassan's Episode Guide.
- [NYPDBlue.Drinking Game](#) - Alan Sepinwall's Drinking Game
- [NYPDBlue.faq](#) - The all NYPD Blue FAQ list
- [NYPDBlue.faq.html](#) - WWW version of the FAQ.
- [NYPDBlue.emmys94](#) - NYPD Blue's 1994 Emmy nominations and awards.
- [other credits](#) - The cast and crew's other credits.

### Pictures (JPEG format)

- [pictures/bg3.jpg](#) - Still from show - Simon/Sipowicz/Fancy
- [pictures/caruso1.jpg](#) - David Caruso
- [pictures/caruso2.jpg](#) - Kelly & Martinez
- [pictures/caruso\\_stringfield.jpg](#) - John & Laura
- [pictures/caruso\\_tv.jpg](#) - David Caruso on cover of TV Guide (8-14 Jan 94)
- [pictures/cast.jpg](#) - Cast publicity photo from Season 1

This is one of the few graphical Web pages in the Tardis archive



## PCIV "Contacts"

Ensemble is at 001 415 617 9600  
or <http://www.ensemble.com/>  
For more information about  
Personal Journal, call Dow Jones  
Business Information Services on  
001 609 520 4000 or email [personal.journal@nrs.dowjones.com](mailto:personal.journal@nrs.dowjones.com).

**Infoseek**

When people talk about charging for access to databases of information across the Internet, they normally mean business information. But Infoseek is gambling that people will be willing to pay a fairly small amount for faster or better-organised access to databases of less commercial information, like Web pages or the contents of newsgroups.

**Tardis Archive:** [uk/comedy](#)

This WWW page contains gopher links to all of the files in the *ult/comedy* section of the archive. They are slowly being changed to proper WWW index pages - please [email me](#) if you are willing to add index pages for a particular series. These pages (e.g. [NYPD Blue](#)) contain links to all the files on this site, as well as links to other net resources for that series.

You might want to look at the Caribou 2 page for more information on UK comedy.

There are the following general-interest files about UK comedy:

- [www.iaea.org](http://www.iaea.org) (www)
- [www.iaea.org](http://www.iaea.org) LEAG
- [www.iaea.org](http://www.iaea.org) LEAG
- [www.iaea.org](http://www.iaea.org) LEAG

Plus the following episode guides:

- 2 *Freedom (dir)*
- *Are You Being Served?*
- *Blackadder (dir)*
- *Bottom (dir)*
- *The Brit Empire*
- *Cathy Nixson*
- *Grimm's Death*
- *The Comic Strip Presents*

**Just a selection from Tardis' vast archive of TV comedy**

It has two charging plans — \$9.95 for one month including 100 free transactions, or \$1.95 for one day including eight free transactions. Searchable databases include four weeks' worth of Usenet news, the NewsBytes computer news service and some sketchy movie, book and music reviews from a company called Cineman. Infoseek also provides access for extra payment to two "premium" collections: an archive of the American computer weekly Infoworld (access costs \$5 more per month for 100 transactions) and Computer Library, a database of about 100 computer and business publications



**Cerberus will bring music across the Net to your PC**

costing \$5 per query.

The Lycos Web crawler at <http://lycos.cs.cmu.edu/cgi-bin/pursuit> has as good an index to Web pages as Infoseek,

provided entertainment on the Internet. The Games Domain in Birmingham at <http://wclrs.bham.ac.uk/~djh/index.html> is one of the best Web sites available for getting information about computer games, the Internet Movies Database at <http://www.cm.cf.ac.uk/Movies/> which originated in Cardiff has one of the most extensive databases of Movie information available, and

as a Civil Servant in OFSTED, London, who altruistically maintains the Tardis files in his spare time. If you can provide more program information, would like to help, or just want to thank him for putting together such an extraordinary resource, you can reach him as [dave@cheers.demon.co.uk](mailto:dave@cheers.demon.co.uk). More information about Tardis is available by emailing [tardis-faq@cheers.demon.co.uk](mailto:tardis-faq@cheers.demon.co.uk), or simply check out the pages at <http://src.doc.ic.ac.uk/public/media/tv/collections/tardis/index.html>.

## Cerberus

Could the Internet make CDs, tapes and record shops obsolete? Not in the next five years, I'd say, but the founder of Gerberus thinks he might be able to undermine the whole music industry and why shouldn't he try? His idea is simple enough:

## CyberSight's Hangman



Word so far :- s \_ \_ \_ \_ e \_

Pick a letter

a, b, c, d, f, g, h, i, k, l, m,

n, o, p, q, r, u, v, w, x, y, z,

but its servers are often busy when you call them up. You can get Usenet news articles that match keywords via the Stanford Netnews Filtering Service at <http://woodstock.stanford.edu:2000/>, but you don't get instant gratification: you tell it the kind of articles you want and it emails them to you. It can be worth paying extra just for the convenience of a quick response. And the other databases, being commercial, are not available anywhere for free.

Infoseek's server is at <http://www.infoseek.com/>

## Tardis

Britain seems to be turning into a world leader in voluntarily

now I find that Sunsite Northern Europe, in Imperial College, London, is home to the Tardis files, one of the most extensive collections of text about television available. Altogether it holds more than 18Mb of plain text alone, which is available by email and gopher and is slowly being translated into Web pages by its archivist, Dave Chapman. Dave is a recent graduate from the University of Edinburgh, with a degree in Artificial Intelligence, currently working

***You probably never thought  
of using the Internet for this...***

instead of digitising music and pressing it onto CDs which are sold in record shops (after being marked up several times in the distribution process) why not send the digitised music directly from the bands to the consumer across the Internet at a considerable discount? Because an average single takes at least ten minutes to download by fast modem, since the sound quality of



audio compressed 15 or 20 to one can't be as good as CD quality, and because you'd need to leave your computer on to play any of it.

If those drawbacks don't put you off, drop by Cerberus' Web site at <http://www.cerberus.co.uk/cdj/>. There you can download the proprietary Windows software you will need to grab and decode the available music, and find out which bands this pioneer has managed to sign up.

### CyberSight

CyberSight specialises in marketing across the Internet, but its Web site is of interest to more than businesspeople. CyberSight believes that in order to get people to look at your commercial site on the Internet, you have to add some element of entertainment to your product information, and its Web pages at <http://cybersight.com/cgibin/cs/s?main.gmm1> contain several examples of the sort of goodies they can help you provide. When we looked at it last, the Web toys on offer included a game of hangman, interactive polls and several trivia quizzes.

### Books

If you are interested in books,

## Lottery



## The National Robbery and You

In the interests of balance, after providing you last issue with two Web pages providing lottery info, here is a Web page of lottery abuse — "The National Robbery and You" at <http://www.dcs.aber.ac.uk/~ajr/scribbles/lottery.html>.



*If you thought the Internet was just for adults, think again. Here's a child-friendly Internet resource*

the Internet Bookshop could be the reason you needed to get on to the Web. At press time it indexed 780,000 books, and only allowed you to search books by subject or publisher, but it has been developing fast so the number of books and indexing methods will doubtless have improved by the

time you read this. If you are interested in getting information about books from a narrow subject area, the Internet Bookshop also hosts dozens of mailing lists which keep you up to date as new books are published. Check it out at <http://www.bookshop.co.uk/>.

### Kidlink

There's enough dubious material on the Internet to make parents nervous about letting their children loose on it, but there are also some great educational and social resources available, especially since an increasing number of American schools are beginning to get connected.

One of the more interesting projects is called Kidlink, a series of email-based discussion groups for kids aged 10-15. It started in 1990, and in the last five years more than 30,000 children have participated. If you want to give your child or classroom the opportunity to

converse with others across the globe, under adult supervision, send a message to [LIST-SERV@VM1.NODAK.EDU](mailto:LIST-SERV@VM1.NODAK.EDU) containing the words GET KIDLINK GENERAL or point your Web browser at <http://kidlink.ccit.duq.edu:70/0/kidlink-general.html>.

### British Tourist Authority

The British Tourist Authority is now on the Web at <http://www.interactive.line.com/british.html>, but at press time, at least, its first efforts were rather unimpressive — badly organised and formatted. Its work with CompuServe is much more sophisticated, and I hope its Internet presence will have evolved to match by the time you read this.



### January & February

- [ART GALLERIES](#)
- [CONCERTS AND RECITALS](#)
- [DANCE & MUSIC](#)
- [FACT FILE](#)
- [EXHIBITIONS AND FAIRS](#)
- [JAZZ](#)
- [A DAY OUT OF LONDON](#)
- [MUSEUMS](#)
- [MUSICALS AND CHRISTMAS SHOWS](#)
- [OPERA](#)
- [PAGEANTRY](#)
- [POP AND ROCK](#)
- [RIVER AND CANAL TRIPS](#)
- [SIGHTSEEING](#)

### The British Tourist

*Authority's Web site was pretty poor at press time, but may be better now*

## Welcome to the Internet Book Shop

783728 Books on line



### Book of the Month



This month's featured author



Terry Pratchett



NEW

## Data Storage Sensation

We dare you find a more cost-effective way to extend the power of your notebook and desktop PCs

**Disklite** brings more than just a new lease of life to your notebook and desktop PCs:

- it's so convenient – a 520Mb pocket-sized *Disklite* hard disk stores more data than 360 slower less reliable diskettes
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- it's ideal for locking away sensitive files and data vital to your business
- you can plug it into any notebook or desktop PC with a Centronics-type printer port, and print at the same time
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- it runs without battery or mains adaptor – especially useful with your notebook

### Your money back guarantee

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### What the experts say

*"An idea so simple, ingenious and useful that I wonder why it hasn't been invented before. There are lots of potential usages and applications for these drives as they are so easy to connect and disconnect."*

– CD-ROM Now, Nov'94

*"There are many applications, the most obvious being transferring files between systems. As the drives are easily removed, they can be used for securing sensitive data, high-speed data backup, or to increase storage capacity for notebooks. Disklite is sensibly priced and many PC users will find it valuable."*

– Personal Computer World, Mar'95

### Prices (exc VAT)

*Disklite* - fit your own disk ..... £99  
with 170Mb 2½" IDE disk ..... £249  
with 250Mb 2½" IDE disk ..... £299  
with 340Mb 2½" IDE disk ..... £379  
with 520Mb 2½" IDE disk ..... £499  
Next day delivery to mainland UK .... £8

Price includes a full 1 year Warranty

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And, as you'd expect from a company at the heart of the presentation industry, there are plenty of quality names to choose from.

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Crashed hard disk?

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# net.news

## New Internet Applications

The last few months have seen dozens of new companies offering Internet applications, and alliances between major industry players to broaden the spread of those applications by bundling them with existing products and operating systems. This was a necessary phase, but already there are signs that Internet software is moving on to another stage in its evolution. Instead of producing more of the same — better Web browsers and better-integrated suites of traditional Internet applications — forward-looking companies and individuals are coming up with new kinds of applications. One which has attracted a remarkable amount of interest is...

### Internet voice communication

As far back as the August Internet column last year I brought to your attention a product called Internet Voice Chat, which, as its name suggests, allows you to conduct conversations with others using the Internet. Because of the overhead involved in compressing speech and sending it in a burst across the network, it will never be a substitute for the ordinary telephone. Sound

quality is limited because of the compression involved and it is "half duplex" — both parties can't speak and be heard simultaneously. It does have a key advantage, though. Since it works across the Internet, which generally has a flat-rate charging structure, you can talk to anyone else on the Internet with a similar setup for the price of a local call.

Neither IVC nor a later, public domain, package (Internet Global Phone) attracted much attention in the mainstream media. They were a little rough-edged, and their creators were not particularly skilled in PR. The product which got onto the front page of the Wall Street Journal and across the world's media is Vocal Tec's Internet Phone. It is a more polished product than IVC and IGP, in a number of ways. It comes with a Windows Help file and you don't have to have or remember a person's TCP/IP address to use it as you do with the other packages. It piggybacks on the existing Internet Relay Chat service, a long-established public domain realtime conferencing tool. IRC requires you to type messages to people, Internet Phone lets you click on their names and (if you both have the software

running) speak to them. Instead of having to arrange with someone beforehand when you wanted to connect and get their "number", it has become possible to ring up a perfect stranger on impulse who shares a common interest and have a chat. This isn't as strange as it sounds; much of what goes on in Usenet newsgroups and on IRC is the same sort of thing, but using text instead of voice.

Global Phone requires a 486 PC with sound card and a fast (V.32bis) modem to operate. A version is freely downloadable which "hangs up" after a few minutes' conversation; \$99 buys you a registration code which unlocks the program.

Sometime before the middle of the year, a second company, Camelot, plans to produce a \$99 Personal Internet Companion Kit, which, it is claimed, will support "full duplex" (simultaneous speaking) and encrypted telephone calls. Also, microWonders Inc, which released Internet Global Phone, is working on a Windows 95-only communication product.

IVC and IGP are both available from the SunSite Northern Europe FTP site ([src.doc.ic.ac.uk](http://src.doc.ic.ac.uk)) in the packages/windows3/winsock/ and

packages/windows3/demo/ directories respectively. Global Phone is available from Vocal Tec's web site at <http://www.vocaltec.com/> or directly via FTP at [ftp.vocaltec.com](http://ftp.vocaltec.com). Vocaltec has a European office at +972 3 561867.

### Web-based conferencing

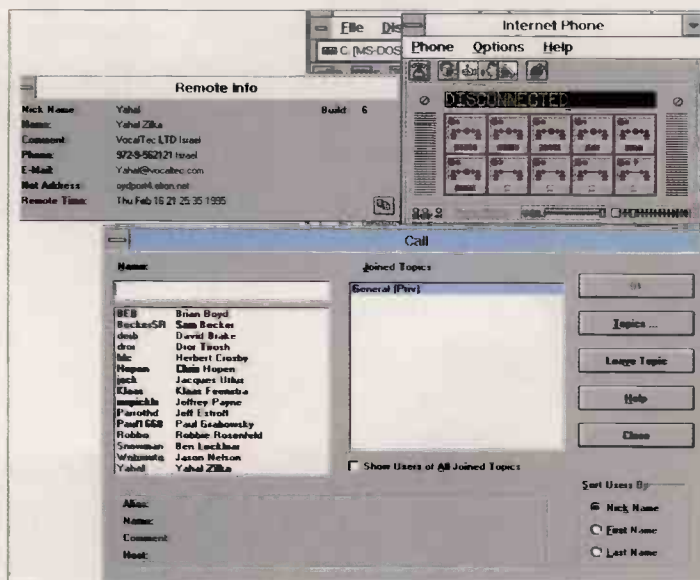
In a similar vein, several organisations are working in parallel to develop conferencing applications based around Web pages. In future, using this new software, as you look at a

Web page, you will see everyone else who is looking at it at the same time, and be able to type messages to them, talk to them or even videoconference with them, depending on the speed of your connection. For companies selling their wares through web pages, this is also an opportunity to have a sales rep or technical support person on hand to answer questions.

A public-domain project, SocialWeb, is underway, led (as an astonishing number of interesting net projects are) by a member of MIT's Media Labs. For more information, surf on over to [judith.www.media.mit.edu/SocialWeb/SociableWeb.html](http://judith.www.media.mit.edu/SocialWeb/SociableWeb.html). Ubique is a commercial company with broadly similar goals: to find out more about its Sesame and Doors products, check out [www.ubique.com](http://www.ubique.com).

### Notes to Web Software

Lotus Notes is the most popular piece of groupware and it already supports TCP/IP, the Internet's own networking protocol, so offices in different countries can use it to link their Notes databases together. Now it's going a step further, linking to the World Wide Web and Usenet News. At a developer's conference in January, Lotus announced its own Web site, which is created and maintained using a beta version of InterNotes Web Publisher. With this \$7,500 package, due by the middle of this year, companies should be able to publish internal Lotus Notes databases to the world through the Web automatically, using familiar Notes tools to create and manage information instead of learning HTML, the Web's native language. Although it's unlikely that automatically generated pages will ever be as well designed or powerful as hand-coded ones, the improvements in speed of page creation and ease of use should make it a boon to Notes-using companies keen to open up to the outside world. Lotus also announced InterNotes



Vocal Tec's Internet phone is the most successful attempt yet to popularise voice communication over the Internet



News, a \$2,500 add-on which is a gateway between Notes and Usenet News, the Internet's foremost public conferencing tool, allowing employees to monitor and participate in relevant newsgroups, for marketing or research purposes.

Lotus has not been first with an Internet link to Notes, though. The Walter Shelby Group has already launched TILE for Windows, Windows NT and OS/2. At \$2,995 it costs considerably less than Lotus' own Web Publisher, appears to do much the same tasks, and, of course, it is available now, while Web Publisher is still months away from shipping.

Lotus Web pages are at <http://www.lotus.com/> or phone 01784 445808; Walter Shelby Group is on <http://www.shelby.com/> info@shelby.com phone 001 301 718 7840.

#### UK Online

UK Online has revealed more about its plans for the service, which should be beta testing in April. The core of the service will be online shopping and local information, making it akin to a digital local paper. The service is aimed at relative

online novices. It will use sophisticated AI software that allows natural language queries like "where can I buy a bike in Bristol?" to search the relevant areas on the service.

Five or six high street shops are expected to be online from the time of launch, including Kay's catalogue. The service is aimed at the whole family, and a single membership fee will allow several mailboxes and user profiles. While adults can gain full access to the Internet, it will be possible to restrict children's access to certain areas.

Charges had not been set as we went to press, but are likely to be a flat fee of £10 to £15 per month for somewhere between 30 and 50 hours' usage. It will be possible to purchase goods online, but the intention of the organisers is that added charges, for database searches or access to support forums, should be avoided. UK Online will work at 28,800 baud right from the start, and it will not charge extra for ISDN access, either.

UK Online 01749 345006

#### Delphi Web-bound

Delphi, an online service with 100,000 members, now owned by Rupert Murdoch's News

Corporation, is set for a top to bottom facelift and a relaunch this September.

The first new product from Delphi, available by the time you read this, will be an email-only service. For £4.99 plus VAT, subscribers will be allowed the equivalent of 1000 mail messages a month using an offline reader, designed to keep phone bills to a minimum.

It isn't clear exactly what additional content there will be on the new Delphi, but it will be based on TCP/IP, giving native support to the broad range of Internet applications, and its primary interface will be through the Web. Delphi has licensed NetScape's Web browser and promises an interface that incorporates audio and video. Its objective will be to provide the easiest possible interface to the Internet, with support tailored to the ordinary home user.

Delphi 0171 757 7080  
ukservice@delphi.com

#### CompuServe news

CompuServe will offer full Internet access as an (added cost) option to all its subscribers from this month, alongside a new version of its WinCIM front-end software

which works over TCP/IP.

It wasn't clear as we went to press exactly how the new service would work, but it appears that users will be able to connect to CompuServe as normal or call the same numbers and connect via TCP/IP, in which case they will be able to use any Internet software including Web browsers at the same time as they connect to CompuServe, but will pay the Extended Rate charge of \$4.80 per hour while connected, even when they are connected to basic rate forums. By the end of this year, there will be a limited number of British nodes with V.34 access, and all UK nodes should be accessible at V.32bis speeds.

The new CIM for Windows, version 1.4, will sport an enhanced interface as well as TCP/IP connectivity. It will be able to launch applications for you automatically — useful for browsing Acrobat files, for example — and it has more sophisticated support for real-time online discussions.

This month will also see a new, eight-volume Hutchison encyclopedia online, which will have multimedia files as well as text, and next month should see the launch of a UK

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As if the features offered by the standard software are not enough there's more to come! Several major software vendors, such as Delrina, Pacific Image and Bit, are working on software to expand the features of this amazing new technology. For instance, Supervoiced PRO, slated for release mid '95, will have PABX control for sophisticated Auto-Attendant functions and a powerful script language for user configured applications.

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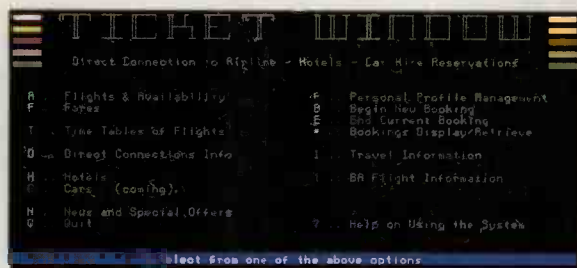
home shopping service beginning with eight major high street vendors of products like records, videos, books, flowers and, of course, hardware and software. By the end of the year, CompuServe hopes the number will increase to 25. CompuServe 0800 289378 or <http://www.compuserve.com>

### Minerva launches travel service

Minerva Online, a London-based bulletin board with links to the Loot free ads magazine and a variety of shareware CD-ROMs, now offers free travel information online using the Galileo ticket booking system and Internet access for £99 a year.

Travel Window is run by Minerva in association with Seaforth's Travel, which acts as the agent, and the Galileo system it gives access to is the same system as high street travel agents use, allowing users to arrange all aspects of their travel themselves.

Minerva Online has access to the Internet itself in order to provide the services it does, and it has modems for dialling in



Minerva Online brings you travel booking information free, and full access to the Internet inexpensively

directly, so the company sees branching out into inexpensive provision of Internet access as a natural extension of its existing business.

The Minerva Online Service is on 0181 402 3350. It gets its lines through the Nynex cable company so other London-based Nynex cable subscribers should be able to connect to it for information or access to the Internet free of charge.

### 2000 Free UK Online Trials!

UK Online is launching the first family oriented online service and is looking for 2,000 PCW readers, interested in this new development in leisure computing, to join a free introductory trial of the system.

Each participant will be supplied with the necessary Windows applications software but must already have a 14.4k (or faster) modem. Those assisting with the test will be given three months free access to the service, which will include an email address and Internet connection. During the trial period, UK Online will be providing a Point of Presence (PoP) in Central London.

It's important to remember that while most of the framework for the service will be in place, the software and editorial content will still be under development. Trial members will be expected to offer constructive comments and be active in giving feedback to UK Online's technical and editorial staff.

Because the service is aimed at novice online users, UK Online will be providing, as part of its membership package, fully licensed and configured

software and full technical support.

UK Online will be competitively priced, with most of the service accessible at a flat-rate monthly subscription, and no online time charges. The pricing will be equivalent to a satellite channel subscription.

UK will contain material for men, women, young adults, children and the home office user. The strong family positioning is important, and the content contributed by UK Online and its membership will be carefully monitored.

Even if you're not one of the lucky 2,000 you will still receive a free one month subscription to UK Online when it is formally launched.

If you would like to join the trial, write in no more than 50 words why you would like to participate, giving brief details of your hardware, to:

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# Comms

**Great Walls of Fire**  
by Stephen Cobb

A couple of months ago I talked about the need for "firewalls" to protect computer systems while they are connected to the Internet. Firewalls are a combination of hardware and software designed to prevent outsiders from accessing your system via an Internet connection. The need for them arises from the fact that when you are connected to the Internet you become part of it — one more node on the world's biggest network.

Thanks to some recent high-profile cases, firewalls are now a very hot item, so to speak, with companies such as IBM, Secure Computing and Harris Computer Systems announcing products in the £15,000 plus range. Obviously these are aimed at corporate users, so what about you and me, the folks who connect to the Internet over the phone using providers like Demon and Cityscape? Should we be concerned and should we buy a firewall?

The answers are definitely yes and probably not. We definitely need to be concerned but we probably don't need to set up firewalls unless the PC we use to access the Internet is connected to a local area network or contains extremely valuable data. However, it is important to note that accessing the Internet using PPP or SLIP is not in itself a defence against hacking. While you are connected to the Net you are running TCP/IP network protocols, designed to let your machine see other machines and them to see yours.

Of course, if you only have partial Internet access, for example using email through a bulletin board system, then you are hidden from the Net. And even if you use PPP or SLIP but only log onto the Net for short periods of time to send and receive mail, you are only a brief blip on the digital landscape and hardly a promising target for hackers. But if you spend any serious time browsing the Web or exchanging files with ftp, you need to be aware of your exposure.

Here is what Grahame Davies at Demon, the UK's largest dialup direct Internet provider, has to say: "Service providers will *not* allow PPP connections to act as routed network links. In other words, only packets addressed to your

computer would be passed to it by the service provider." Furthermore, he notes: "Without running servers there would be no process to connect to."

In other words, if you are not running any network software, such as an ftp server, your computer will appear on the Net but not provide anything with which another computer can interact. (An ftp server is the software that allows you to download files from another machine using an ftp client program.)

Another place to look for help with Internet security is the CompuServe forum run by the National Computer Security Association (GO NCSA). Answering a question about PPP exposure, Doug Wyman, a regular contributor to that forum, confirmed: "Only packets addressed to your computer would be passed to it by most service providers."

### Spoof proof

There is more to the story than this, but before we go any further two caveats are in order. First of all, the statement that "only packets addressed to your computer would be passed to it" highlights the technology at the heart of the January CERT alert which was widely reported in the business press. CERT is the Computer Emergency Response Team, established in the wake of the Morris Internet worm incident back in November 1988 (you can visit CERT on <http://www.cert.edu>).

Whenever there is cause for concern CERT issues security alerts to the Internet community, and on 23rd January this year it warned about IP spoofing. That's IP as in Internet Protocol, as in TCP/IP, the network protocol that enables the Internet to function. IP demands that all computers on the Net have a unique address. You might think of this as your Internet name, as in [cobb@iu.net](mailto:cobb@iu.net), but as Internet consultant Steve Kennedy explains, "IP relies on numbers not names".

Kennedy notes: "When you connect to a service, say ftp, the ftp server will talk back to your address. The local service, say the ftp client, will locally convert any names specified to IP addresses. This is usually performed by the local host's file service or by DNS, the Domain Name Service." Some service providers allocate permanent IP addresses to all subscribers, others allocate them dynamically for each session, but in either case you have a specific IP address while using the Internet.

IP spoofing involves a hacker reading your IP address from the packets of data you send out from your machine (for example, in email) and adding these



addresses to his own data to make it look like they belong to you. He then feeds those packets to your computer, bypassing the general rule: "only packets addressed to your computer will be passed to it".

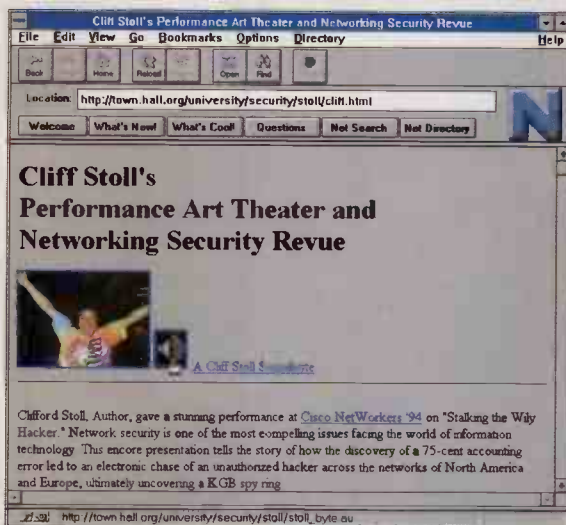
Ironically, the growing use of firewalls may be responsible for the sudden increase in IP spoofing. People have known about IP spoofing for years but it wasn't considered a problem since few hackers bothered to do it. At one time most Internet sites could be entered without the need for such subterfuge. But as more sites, notably those operated by commercial organisations, introduced routers (specialised computers that control the flow of data packets based on their origin and destination addresses) it became harder to waltz right in.

Fortunately, it is not too difficult to defend against spoofing. According to Karen Hutchison, Director of Secure Business for Harris Computer Systems: "A good firewall product, such as our Cyberguard, prevents IP spoofing by searching for discrepancies between IP addresses and the network from which the message originated. Any discrepancies indicate and block unauthorised access attempts."

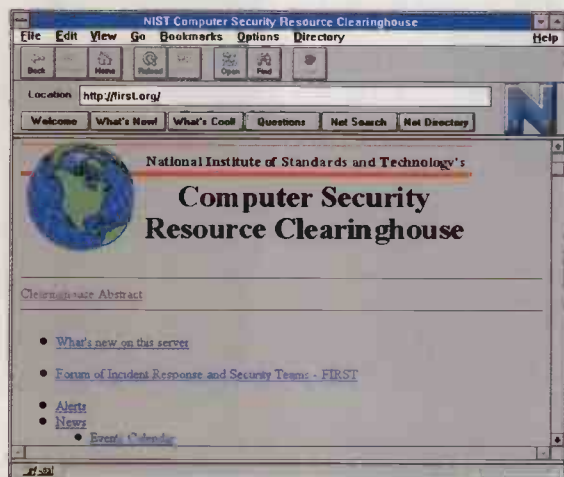
#### Around the Great Circle

But that's not the end of the story. Earlier it was noted that if you are not running any network software, such as an ftp server, your computer will appear on the Net but won't provide anything with which another computer can interact. To verify this I posted a question to the Firewalls discussion group hosted by Great Circle, a firm of Internet consultants. You can join by sending a message to [major-domo@greatcircle.com](mailto:major-domo@greatcircle.com) and placing "subscribe firewalls" in the body of the message; but there are about 40 messages a day so you might want to get the edited version using "subscribe firewalls-digest".

#### Another Brick in the Wall



*Security can be fun. Cliff Stoll, author of **The Cuckoo's Egg**, has created a performance place based on his experience, tracking hackers and uncovering a KGB spy ring*



*A good place to look for help with firewalls and computer security in general is NIST, now on the Web at <http://first.org>*

I am very grateful to all those who answered my query about PPP connections. Paul Robertson warned: "Attacks normally depend on the capabilities of the target machine. Quite a few PC-based TCP/IP packages include FTP servers. Some of them allow UNPROTECTED FTP by default. In this case, an attacker would have access to the entire hard drive (read/write) and any network drives as well." Even if the package you are using does not install ftp with the server capability turned on, it is very easy to turn it on by mistake as no warning messages appear. Make sure that you turn it off!

Furthermore, Robertson notes: "If I am logged onto our company's network, the hacker can then look around for TCP/IP

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packets to get logins, passwords and so on." Over on the NCSA, Doug Wyman pointed out that for this type of PPP attack to succeed, "the stack would have to be configured to make use of *both* the network links (the PPP and the network card) which would require a configuration of your network interface card software to support TCP/IP".

If you have ever tried to get more than one network protocol working on a PC you know that it is hardly ever a case of plug-and-play. But there is one obvious situation that is cause for concern: a network that is already running TCP/IP as the standard protocol. This was pointed out by a network expert at a large UK manufacturing company, who preferred to remain anonymous. Noting that "connecting to the Internet is simply a matter of plugging in a modem and turning on the SLIP feature, which is already built in", he suggests that some users are tempted to do this surreptitiously because "management has refused to provide Internet access". Unfortunately, few users or management realise that as soon as one node on a LAN running TCP/IP connects to the Internet, the whole LAN is open to attack.

If you think this is alarmist, consider these remarks from Paul Robertson: "It really depends on what your TCP/IP stack is doing, and what programs are running at the time. Since most PC stacks use Winsock (and it's fairly easy to write Winsock applications) it's rather trivial to write an application that sits as a server and hide it under Windows, as an extension to the winsock.dll or something. PC virus scanners wouldn't pick this up since it's not a virus."

His comments emphasise the need to know exactly what you're getting when you install comms and networking software. But Robertson is not all doom and gloom, rating such a sophisticated scheme to attack dialup PPP machines as unlikely. Robert Bonomi points out: "If the 'personal' machine is *not* providing any services (that is, no server or daemon type tasks) but has only client-side software (telnet not telnetd, ftp not ftpd), then there is no possible point of attack and any sort of a firewall would just be silly."

Bonomi further observes: "It is unlikely that 'personal' machines would have any reason to provide any such externally accessible services, *except possibly* for a mail handler." Most of us who use the Internet have a mail program but these vary widely in design and capability. Some of them act as mail servers, receiving mail automatically whenever

you are logged on to the Internet. These are typically based on SMTP or Simple Mail Transfer Protocol. Demon supplies one when you sign up for its Internet service.

Other mail programs, such as those running POP or Post Office Protocol, are designed to fetch mail only on demand and are referred to as mail clients. Typical of these is Eudora, which works well as an offline mail reader. Unfortunately, outside interference is possible "if mail is being automatically delivered to your machine". It is much safer to use an "on-demand" mail handler, like Eudora or a similar POP-based program.

#### A fact of life

All Internet users, even us humble home users, need to realise that hacker attacks are a fact of life on the Net. Firewalls and IP spoofing are a matter of concern to us all. Consider this comment from Dr Frederick B Cohen: "PPP is really no different from any other connection to the Internet. Tell your readers that the Internet is a dangerous place, and by linking to it through PPP they are placing all of the information on their computer at risk of disclosure and disruption." The bottom line is that you can enjoy the Internet without fear of loss if you make sure that:

- the server setting in ftp is turned off;
- you use a reliable on-demand mail handler like Eudora;
- you connect to the Net from a PC that is not networked or, if it is networked, a firewall is used;
- all valuable programs and data on the PC you use are regularly backed up;
- any sensitive data files are encrypted (password-protected encryption is an option in most word processing, spreadsheet and database programs).

For more about Harris Computer's CyberGuard firewall the UK number is 01276 686886. You can find more information about firewalls in the Unix/Internet section of the NCSA forum on CompuServe or through these WWW pages:

<http://www2.checkpoint.com:8000/firewall-1.html>

<http://www.greatcircle.com/gca/tutorial/main.html>

<http://www.cis.ohio-state.edu/hyper-text/faq/usenet/firewalls-faq/faq.html>

#### PCW Contacts

Stephen Cobb is on CompuServe as 72662,546 and the Net as [cobb@iu.net](mailto:cobb@iu.net). He is currently working on a new edition of his Guide to PC & Lan Security.

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| Jetstore 5000i bare drive Int Unbounded             | 702  |  |  |
| Jetstore 6000i bare drive Int Unbounded             | 795  |  |  |
| Jetstore 2000 2Gb Ext Unbounded                     | 741  |  |  |
| Jetstore 2000 2Gb Ext ISA Bundle inc ArcServe 250i  | 858  |  |  |
| Jetstore 2000 2Gb Ext MCA Bundle inc ArcServe 250i  | 1021 |  |  |
| Jetstore 5000 4Gb Ext Unbounded                     | 827  |  |  |
| Jetstore 5000 4Gb Ext ISA Bundle inc ArcServe 250i  | 1571 |  |  |
| Jetstore 5000 4Gb Ext MCA Bundle inc ArcServe 250i  | 1707 |  |  |
| Jetstore 6000i 8Gb Ext Unbounded                    | 920  |  |  |
| Jetstore 6000i 8Gb Ext ISA Bundle inc ArcServe 250i | 1951 |  |  |
| Jetstore 6000i 8Gb Ext MCA Bundle inc ArcServe 250i | 2115 |  |  |

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|----------------|-----|----------------|-----|
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| 1Gb Int SCSI   | 499 | 1Gb Ext SCSI   | 639 |

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| 3200 External 4 - 8Gb SCSI DAT      | 940  |  |  |
| 3400DX Internal 8 - 16Gb SCSI-2 DAT | 925  |  |  |
| 3400DX External 8 - 16Gb SCSI-2 DAT | 1025 |  |  |

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| Swift 200 Colour  | 147 | Swift 240 Mono   | 156 |
| Swift 240 Colour  | 178 | Swift 9x         | 169 |
| Swift 200/240 ASF | 65  | Swift 9x/24x ASF | 119 |
| Swift 90 ASF      | 80  |                  |     |

### EPSON

|            |      |           |     |
|------------|------|-----------|-----|
| LX300      | 89   | LX1050    | 172 |
| FX870      | 224  | FX1170    | 282 |
| LQ300      | 142  | LQ570+    | 185 |
| LQ870      | 349  | LQ860 Col | 439 |
| LQ1060 Col | 559  | LQ 1070+  | 284 |
| LQ1170+    | 399  | LQ10300   | 680 |
| DFX8000    | 1939 |           |     |

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| MT130/9 80col         | 264  | MT130/24 80col     | 330  |
| MT131/9F 136col       | 330  | MT131/24 136col    | 385  |
| MT135/24 136col       | 279  | MT135/9 80col      | 275  |
| MT150/24 80col        | 346  | MT150/9 80col      | 285  |
| MT151/9 136col        | 315  | MT151/24 136col    | 399  |
| MT151/9F 80col Colour | 325  | MT151/24 80col Col | 430  |
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| MT1645                | 2615 | MT691              | 5375 |

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| P62 | 327 | P72  | 395 |
| P90 | 565 |      |     |

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| KX-P2135 Colour  | 128  | KX-P1624     | 199 |
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| MP3530 | 295  | SL90+       | 95   |
| SL96   | 132  | SL150       | 215  |
| SL210  | 315  | SL270       | 375  |
| LT200X | 140  | BP5780 MkII | 979  |
| BP7900 | 1099 | SP10        | 1749 |

### STAR

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| LC90          | 83  | LC100 Colour    | 90  |
| LC240         | 92  | LC240C          | 108 |
| LC240 20 MkII | 113 | LC240 30 Colour | 147 |
| LC240 300     | 179 | LC15            | 183 |
| LC24 15 MkII  | 234 | Z4 200C*        | 255 |
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| GenCAD 6.1     | 389 TurboCAD DOS/Win 59    |

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| PC Anywhere 4.5 Win   | 84 Travelin Com Works 89  |
| Delrina WinFax Pro V4 | 53 Delri DosFax Pro V2 38 |
| Delrina WinComm Pro   | 59 Laplink for Windows 95 |

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| dBase V5 Dos        | 325 Delrina Comms Suite 87 |
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| Paradox V4.5 Dos    | 335                        |

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| Corel Ventura U/G | 75                      |

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| Windows 3.11      | 65 Windows NT 249       |

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| MS Vis C Pro 1.5 CD | 259 MS Visual C++ Win 30 |
| MS Vis C Pro Win    | 220 Turbo C++ V3 54      |
| Turbo Pascal V7     | 69 Turbo Pascal Win 84   |
| Visual Basic V3     | 81 VisBasic Pro DOS 189  |
| Visual Basic Win    | 81                       |

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| MS Project Win     | 575                       |

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| Supercalc V5.5 Dos | 65                        |

| UTILITIES            |                            |
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| CheckPro             | 62 CP AntiVirus 58         |

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| Merlin                 | 20 Best of Win Ent Pack 13   |
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| Stunt Car Racer        | 5 B17 Flying Fortress 12     |
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| HP LJ4            | 69 HP LJ/4 (EPS) 55        |
| HP/HP (EPL)       | 45 NEC S/Script 610 72     |
| NEC S60/2/P       | 105 NEC 266/290 78         |
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| Panasonic 4450/55 | 21 Qume Cryst. 85          |

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| Epson LQ150 Black        | 5 Epson LQ150 Colour 16    |
| Epson 80col Spin         | 5 Epson 80col 24pin 6      |
| Epson 136col Spin        | 6 Epson 136col 24pin 6     |
| Epson LQ860 Black        | 10 Epson LQ860 Colour 16   |
| Epson DF5000             | 17 Pana KXP115 9 pin 5     |
| Pana KXP1123/1124        | 6 Pana KXP115 24pin 5      |
| Pana KXP123/1234         | 6 Pana KXP115 24pin 5      |
| Pana KXP2135 Black       | 7 Pana KXP2135 Colour 13   |
| Pana 2180/23/24 Black    | 15 Pana 2180/23/24 Col 15  |
| Star LC10/100 Col        | 4 Star LC10/100 Col 5      |
| Star LC24pin Mono        | 5 Star 136col Spin Black 5 |
| Star 136col Spin Col     | 12 Star LC200 Black 6      |
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| Star LC240C Colour       | Call Star LC2400 Black 4   |
| Star LC24/300 Col        | 10 Star X824 Black range 8 |
| Star X824 Colour range   | 11                         |

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| Canon BJ800 8C-02       | 6 Canon BJ800 Colours 18     |
| Canon BJ4000 Black      | 22 Canon BJ4000 Col 14       |
| Canon BJ4000 Col        | 22 Canon BJ4000 Col 18       |
| Epson Stylus 300        | 13 Epson S1170/870 10        |
| Epson Stylus 800/1000   | 9 Epson Stylus Col 14        |
| Epson Stylus Col. Col   | 29 HP DJ 310/320/540 15      |
| HP DJ/DW Dbi.Cap        | 19 HP DJ/DW Colour 20        |
| HP DJ 1200C Black       | 20 HP DJ 1200C Colours 24    |
| HP Designjet 650 Black  | 24 HP Designjet Colours 32   |
| HP Paintjet Colour      | 20 HP Paintjet Black 18      |
| HP Paintjet XL Black    | 15 HP Paintjet XL Colours 17 |
| HP Paintjet XL300 Black | 15 HP Pjet XL300 Colours 17  |
| Star SJ144 Black cap    | 6 Star SJ144 Col paper 7     |
| Star SJ144 Black/HP     | 12 Star SJ144 Col DHP 14     |

| TONERS            |                            |
|-------------------|----------------------------|
| Canon FCL Copier  | 75 Canon FCL Copier 75     |
| Epson FPL400      | 60 Epson FPL810 119        |
| Epson FPL5600     | 105 Epson FPL5000/5200 82  |
| HP 4L             | 45 HP 4L/45/45/45/45 85    |
| HP LJ4            | 69 HP LJ/4 (EPS) 55        |
| HP/HP (EPL)       | 45 NEC S/Script 610 72     |
| NEC S60/2/P       | 105 NEC 266/290 78         |
| Panasonic 4420    | 24 Panasonic 4430/10/40 28 |
| Panasonic 4450/55 | 21 Qume Cryst. 85          |

| ORIGINAL RIBBONS         |                            |
|--------------------------|----------------------------|
| Citizen 1200/2400        | 4 Citizen Swift 24/240 5   |
| Citizen Swift 24/240 Col | 11 Epson LQ100 15          |
| Epson LQ150 Black        | 5 Epson LQ150 Colour 16    |
| Epson 80col Spin         | 5 Epson 80col 24pin 6      |
| Epson 136col Spin        | 6 Epson 136col 24pin 6     |
| Epson LQ860 Black        | 10 Epson LQ860 Colour 16   |
| Epson DF5000             | 17 Pana KXP115 9 pin 5     |
| Pana KXP1123/1124        | 6 Pana KXP115 24pin 5      |
| Pana KXP123/1234         | 6 Pana KXP115 24pin 5      |
| Pana KXP2135 Black       | 7 Pana KXP2135 Colour 13   |
| Pana 2180/23/24 Black    | 15 Pana 2180/23/24 Col 15  |
| Star LC10/100 Col        | 4 Star LC10/100 Col 5      |
| Star LC24pin Mono        | 5 Star 136col Spin Black 5 |
| Star 136col Spin Col     | 12 Star LC200 Black 6      |
| Star LC200 Colour        | 11 Star LC240C             |



# net.newbies

## Getting started on the Net



If you don't know what a "newbie" is, you probably are one. These pages are designed to be an easy-to-use reference guide to the Internet for the novice — or newbie, as hardened netters will call you.

If you don't understand what I have written or you have any suggestions, please don't hesitate to mail me at David\_Brake@pcw.ccmil.computer.com, or via "snailmail" — Internet-speak for paper mail.

Meanwhile, here's an easy-reference guide to the tools which will help you make the most of the Internet.

### Mail

Almost every BBS and on-line service can offer you some kind of gateway into the Internet for electronic mail — it is the "lowest-common-denominator" service. The standard way of addressing Internet mail is person@organisation.something.something. But the way you send mail out from a local system varies from system to system.

On CompuServe, to send a message to me at CIX you'd type "internet:derb@cix.compulink.co.uk" in the address field. To send a message from the Internet to my CompuServe account (70007,5442), you'd send to "70007.5442@compuserve.com".

Because many users are limited to electronic mail-only access to the Internet, a number of ways have been devised to allow you to read newsgroups and search for and download files. All these methods are very clumsy, though, and not to be recommended unless you are desperate or don't have any choice.

One of the most commonly asked (and understandable) questions about the Internet is "how do I find a person on the Internet?". There are at least ten different ways of doing this, none of them particularly reliable. It is a subject in itself: to get a mail message giving some of the options, send mail to mail-server@rtfm.mit.edu with "send usenet/news.answers/finding-addresses" in the body of the message.

It is hardly surprising that finding people is tricky, since there is no central authority with which every user has to register to get on-line, the population of the Internet is growing incredibly quickly, and many companies and individuals don't want their internal electronic mail addresses listed.

Mail was Tool of the Month in last October's Internet column.

### Newsgroups & Mailing Lists

The ability to read and post to these is probably the second most popular service after mail. They are the equivalent of forums or special interest groups on bulletin boards, and cover every special interest imaginable.

In both cases the idea is simple: any subscriber can post queries or comments which can be read and replied to by all other subscribers across the globe.

A mailing list, as the name suggests, uses mail, which has the advantage that anyone with mail can use it. Accessing newsgroups requires a newsreader program — there are dozens available — and they generally allow you to organise messages by subject and produce "kill files", which enable you to ignore messages on boring subjects or by boring or offensive people. (Sadly, there are a lot of the latter, and the problem is getting worse.)

Specialist newsgroups such as bionet.molbio.embl.databank (discussion about the EMBL nucleic acid database) generate a manageable number of messages each day. But a popular newsgroup like rec.arts.movies generates thousands of messages a month from its huge readership — estimated at 100,000 in May last year, which means it could be twice that now. Reading through a couple of newsgroups of that size without sifting through them beforehand could be a full-time job and run your phone bill into the stratosphere.

### WWW — the World Wide Web

This tool was designed at CERN (the European Laboratory for Particle Physics) in

Switzerland. As discussed in the July issue, it is by far the sexiest interface to the Internet, and if someone wants to produce an impressive Internet demonstration, nine times out of ten they'll use WWW to do it.

The good news is that it can provide a graphical front-end to almost any Internet resource, and like Gopher it provides links to information all over the Internet. The bad news is that unlike Gopher, it lacks mature search tools to allow you to find just the item you want. Instead it encourages you to browse from link to link. This is a good way to learn and have fun but a poor way to get things done.

There are many WWW searching tools you could try — the best one is probably the Yahoo search page at <http://akebono.stanford.edu/yahoo/bin/menu?185,16>. There is a less user-friendly but more comprehensive database called Lycos that might be worth a try if the Yahoo index draws a blank — it's at <http://lycos.cs.cmu.edu/cgi-bin/pursuit..>

The WWW's graphical interface requires a lot of speed. Unless you have a V.32bis modem, you may as well forget about the pretty pictures, alluring sounds and even video clips on the Web. A large number of the more interesting resources on the Net are arriving on Web servers, so it's worth knowing that a much faster, if less glamorous, connection to the Web is available via telnet (see the telnet entry opposite).

For the moment, at least, CompuServe subscribers have no WWW access at all, and most other BBS-based services like Delphi and CIX offer text-only access. For full graphical WWW access, you need a TCP/IP connection (ask for it by name).

### Gopher & Veronica

Gopher, designed in 1991 at the University of Minnesota, is called that because it "goes for" information and



because the football team at the college is called the Golden Gophers.

It resembles the WorldWide Web in that it provides a way of linking together different information resources. While the WWW provides links in the form of "hot buttons" on pages of styled text with pictures, Gopher takes the form of a series of menus and sub-menus on each server, some of which lead to other Gopher servers.

CIX and some other service providers allow you to run it from their systems, but if your provider doesn't have it set up you can download your own Gopher client software and use it or telnet to gopher.ebone.net to try it out.

Rather than wander through the maze of menus to find the information you are interested in, you can use Veronica to search through all the menu entries on all the world's Gophers (in theory) for the information you want. To use it, direct your Gopher software to info.mcc.ac.uk and select the Veronica menu item.

Gopher and Veronica were featured in August's Internet column.

#### Anonymous FTP & Archie

Both these services are all about files — how to find them and how to get them. FTP stands for File Transfer Protocol. It is "anonymous" because FTP servers require a username and password before you can connect to them but allow you to connect to parts of them by giving them a login name of "anonymous" and your email address for a password.

Once you are connected, looking around the server for a file usually works much like DOS. DIR or LS tells you the contents of your directory, cd directory-name puts you into that directory.

There are several graphical interface programs available to make FTP easier to use.

Many files stored on other servers are compressed or encoded in various ways, indicated by an extension at the end of the file name. .HQX, .TAR, .ZIP, .SIT and .ZOO each indicate a different kind of file requiring one or more utility programs to convert them.

Finding the file you want on the Internet is not as hard as finding the person you want. But it is still not straightforward or dependable.

There are several tools available to help you find specific documents, but Archie is, as far as I know, the only tool which helps you find the file you want from the 2.5 million or more binary files in its database. You can use it via

mail (send mail to archie@doc.ic.ac.uk to find out how), via telnet (to archie.doc.ic.ac.uk or one of 23 other Archie servers), via the WWW (<http://src.doc.ic.ac.uk/archieplexform.html>) or using one of several pieces of front-end software.

If you know the name of the file you are looking for, your task is fairly easy. Archie allows you to search for exact file names or files containing a set string. If you don't know the name and it isn't obvious, life gets more difficult. There is a database which indexes files by keyword — it's called "whatis" — but it isn't very well kept.

Archie is supposed to provide a complete index of publicly accessible files and each of the several available servers should have the same data.

This is not the case in my experience. Each night, the servers index one thirtieth of the files on the Internet, so they should be a maximum of a month out of date. Unfortunately, the Internet is growing so fast that being a month out of date can exclude many files. Also, not every publicly accessible file archive is indexed. Demon, a service provider for personal and small business use, maintains a 5Gb archive of useful software at ftp.demon.co.uk — because of a technical problem, Archie used to be unable to index Demon's files, but it now can.

Lastly, each server seems to have a slightly different database, so if you're sure a file is out there somewhere but you don't find it on one of the UK servers, try one in the US.

#### Telnet

This is probably the easiest command to understand — telnet to a site by running one of the many available telnet programs (in many cases this is as easy as typing telnet <site> from the prompt of the computer you normally dial into) and you will be confronted by the login prompt of your target computer. Whatever you type will be transmitted directly to the remote computer as if you were typing on its keyboard, and its replies are sent back to your screen.

Normally when you log in like this, you either have an account on the target machine already or it is set up to give you access for specific tasks. To see what you can do, try telneting to telnet.w3.org (a computer in Switzerland). This gives you text-only access to the World Wide Web. The Web program runs on the Swiss machine, but you can manipulate it from the comfort of your chair.

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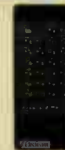
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## Innovations

# Big Blue beams down

**Never one to sit still, IBM has teamed up with Hughes Corp to develop a chain of satellite-controlled "kiosks" which could revolutionise the way software is developed. Tim Frost investigates.**

It's hard to think of IBM as anything but a hardware company, but in fact, it's also one of the world's larger software suppliers. Admittedly, much of it is for the closeted world of business applications for big machines but the activity is there nevertheless.

Now Big Blue wants to break out of the mould, move into the high street and become a major distributor of retail software. But it doesn't want to move in the ordinary circles of duplicating software, putting it in boxes and shipping the boxes all the way around the country. It plans to harness the power of satellite to get software into the shops and then into the hands of the customer.

IBM's idea is to create an in-store duplication kiosk system which copies the software on demand the minute the customer buys it. The kiosk itself is a relatively compact standalone unit, a bit like the print-your-own greetings card units that are appearing in card shops up and down the country. Inside, the box is built around three basic components: a satellite receiver, a large disk store and a disk drive.

IBM has linked up with the Hughes Corp, which is currently helping to drive the Americans to direct-to-home (DirecTV) satellite viewing, something well established here but a new toy in the US. The new software transmission system, imaginatively called DirectPC, will take a feed from an IBM computer at its Software Manufacturing Centre, which contains all the software to be offered for sale.

Overnight, the network will send a complete kiosk full of programs up to the satellite. These will then be transmitted down to the kiosk's own individual satellite receiver, a unit which will be much along the lines of the domestic receiver/dish systems we are used to over here.

Since the satellite data transmission capacity is likely to remain larger than cable's for some time, this is a relatively cheap way to send data from point to point. The data stream bursts are used to update the kiosk's internal optical store with both additional programs and updated versions.

In the morning the kiosk is ready for action. Using the touchpad and screen, the customer can choose from a huge range of software, pay his money over the counter and get a freshly copied version of his chosen program.

While there are obvious disadvantages to this system, such as limited packing and documentation, there are several plus points. These include the fact that the kiosk can interactively show the benefits of different options and help customers in their choice of software. With a kiosk, the shop can stock an enormous range of software without having to spend a lot of cash on stock or use up acres of shelf space.

In theory, this should offer the customer a wider range of software options beyond the current "Top 20", increasingly becoming the only software seen in many stores. The added bonus is that software can be updated on a daily basis, including the latest bug fixes.

The system is not designed for try-before-you-buy, or cheap

shareware, although these will form a part of the library on offer. Major software houses will be experimenting with the system to see whether it opens new opportunities for software sales.

The same principle will be applied on a smaller and less costly scale to distribute software to large organisations who need regular updates of software packages. The primary targets will be software updates, fixes and data distribution in larger corporates, and in these applications, satellite distribution makes a lot of sense. Sending data over cables is mainly one-to-one distribution — if you have 50 branches you have to send the same information 50 times. Being a broadcast medium, satellite is one-to-many, and a single transmission can be picked up simultaneously by all the branches of a company.

IBM is saying that 80 percent of its US software maintenance services will be delivered by satellite by the end of this year. Hughes is predicting that it will have 13 million users of the DirectPC system by the end of the century. And there's no technical reason why DirectPC couldn't develop into direct-to-home software supply, thereby cutting out the physical distribution chain entirely. **PCW**



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## Horizons

# Faster than a speeding Pentium

**When the Pentium went into production, Intel's best chip tricks were reserved for a second chip, soon to be unleashed as the P6. Simon Rockman looks at the "information engine which doesn't stop processing".**

**T**he new Intel chip, codenamed P6, will be with us in a few months and Intel is promising to double performance at a given price point. A £3,000 machine with a P6 should perform twice as well as a two-year-old Pentium machine which cost £3,000 when new. A 133MHz P6 is claimed to be twice as quick as a 100MHz Pentium.

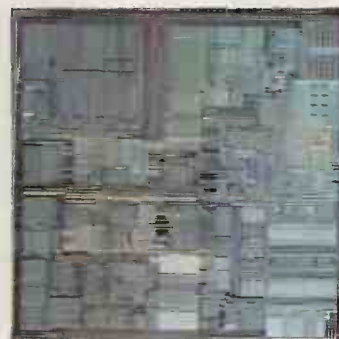
This is a slightly different promise from the earlier one of doubling performance at a given clockspeed. But these figures should be taken with a pinch of pessimism; early estimates of how much faster the Pentium would be than a 486 proved to be optimistic.

The P6 will run significantly faster than the Pentium, in part because the initial versions will run faster internally. The main speed improvement, however, comes from the fact that it is so much more clever. Development work on the P6 started in 1990, at the same time as the Pentium, but the two teams had different design goals and the more complicated tricks were reserved for the later chip.

These tricks, a combination of multiple branch prediction, data flow analysis and speculative execution, have been given the name Dynamic Execution. None of these techniques are new, but the packaging pro-

vides the performance Intel has been looking for. The P6 is not superscalar in the same way as a Pentium: there is no system of twin pipelines which makes it less susceptible to optimisation.

The effectiveness of dynamic execution is shown in a 19 instruction code sample: it takes 17 cycles on a Pentium but only nine cycles on a P6. The difference is accounted for by the time the Pentium spends waiting for dependencies to be resolved. Sometimes an operation cannot be carried out until the result of an earlier operation is known. While a Pentium will wait, a P6 will look ahead for something else



*The first P6 uses 0.6 micron 4-layer technology*

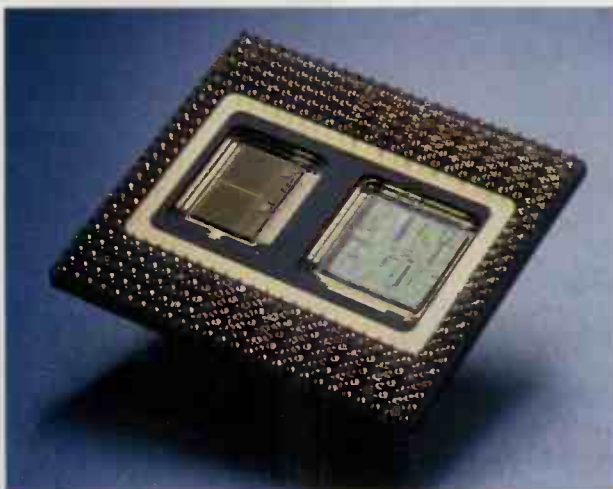
to be getting on with.

### Meanwhile, back at the branch...

This is made possible by multiple branch prediction. A Pentium can look ahead by 256 branches; the branch entry table of the P6 is 512 entries deep. If you thought the lifts in *The Hitch-Hiker's Guide to the Galaxy* were pretty neat — the ones which could be on the right floor before you knew you needed them — that's nothing compared with a chip which can fetch lines of code before the results of previous operations tell the processor what to do next.

Branch prediction relies on a complicated algorithm to work out what is likely to happen next. It starts with the basis of "I recognise this code loop, where did we go last time?" and assumes the same direction if various conditions are similar. It's a fair enough assumption, and with the enhancements to the decision making process it produces very accurate predictions.

The P6 improves on the Pentium's way of doing this but branch prediction alone is not



*The P6 is the first chip to have the CPU and cache in one package*



new. What is new is Speculative Execution. The processor can look at the code it has fetched on the basis of a branch prediction and run it, just in case it is needed. If the program takes the right branch, the P6 won't have just saved the time it takes to get to the work; it will have done it. It's a bit like reading ahead in a textbook and doing tomorrow night's homework before it has been set so that you can go out and play football; although, of course, processors don't play football. If the processor finds it has done the wrong homework in advance, it has to throw away the answers and move on to the set work. The process by which it does this is Register Renaming. When the processor works ahead it puts the results into a spare set of registers. If it transpires that these are the correct registers they are renamed to reflect the correct results. If not, the registers are just ignored.

Register renaming allows out-of-order execution. The processor can grab bits of program and work on them without reference to other parts of the program — assuming the work the processor wants to do does not rely upon the results of an earlier calculation. This is the third aspect of Dynamic Execution, which Intel has dubbed Data Flow Analysis. Intel engineers have analysed the way in which vast numbers of programs work and used this as a guiding light in the processor design. The result is a chip which runs today's programs very quickly without the need for optimising compilers, but it might prove a little restrictive as operating systems and programs evolve over the lifetime of the chip.

The P6 will typically be looking 20 or 30 instructions ahead for something to do. The engineers at Intel describe this as departing from the traditional "fetch-execute" cycle where a processor munches through code an instruction at a time. They call the new process a combination of Fetch/Decode, Dispatch/Execute and Retire. The result is that the chip takes in more of the program and digests it faster. To do this at a lower level there is a 12-stage pipeline (as opposed to the Pentium's five stages and the Cyrix M1's seven). The longer the

pipeline, the better the branch prediction needs to be, but figures are quoted as better than 90 percent for the prediction hit rate using Yeh's algorithm.

A long pipeline means that each stage deals with the information faster, but there is an overhead known as the pipelastage time. The P6 has reduced this overhead by 33 percent, compared with a Pentium made on the same production lines. The use of the same process is crucial to the P6 hitting the targets for its introduction.

#### Non-stop processing

The hypemasters from Intel HQ at Santa Clara call the P6 an "information engine which doesn't stop processing". And for once the hype seems well founded. The more detail in which you examine the P6, the cleverer it becomes. This isn't all just Intel brilliance: some of the ideas have been around in mainframe computing and the academic world for a long time.

Essentially, the P6 is an x86 chip with a few extra instructions. Incidentally, Intel is promoting the term Intel Architecture rather than x86, presumably for legal reasons. And the P6 is still a superscalar chip. It can process a number of operations simultaneously through separate execution units, but while the Pentium has two execution units which are similar to each other, the P6 has several units with very different functions.

For a chip which has to run ten-year-old code the P6 is radically different from anything produced before. It takes three instructions at a time and, using a lookup table, divides them into micro-operations, or micro-ops. Most of the time the correlation between an instruction and a micro-op is one to one. Micro-ops are sent to the Register Alias Table unit where their logical references are converted into P6 physical register addresses. They are then fed through the Allocator stage and into the instruction pool from where they can be processed out of order. All this is essentially the "fetch and decode stage".

#### The First P6 Implementation

Runs at 133MHz  
CPU Die Size 306 sq mm  
CPU Transistors ~ 5.5 million  
L1 Size 8kb instruction, 8kb data  
L2 Die Size 202 sq mm  
L2 Transistors 16 million  
L2 Density 256kb  
L2 Speed Full speed  
Package Size 62.5mm x 67.6mm  
Pin Count 387 pins  
Process 0.6 micron  
Power Dissipation 14W typical, 20W peak for CPU and L2 cache  
Performance estimated > 200 SpecInt92 (measured on a prototype system), estimated 400 TPS at 133MHz  
Enhanced data integrity and reliability features  
Features for simplifying scalable multiprocessor systems design  
Bus width 64 bits external data, 36 bits address  
Bus speed One half, one third, one quarter  
Binary compatible with previous generations  
Sampling Began 1st quarter 1995  
Systems Second half 1995

The dispatch unit takes the micro-ops from the instruction pool and checks for dependencies before execution. In ideal circumstances the P6 can schedule five micro-ops per clock cycle, but circumstances usually restrict that to three. The micro-ops don't need to be chosen in any order, but the number of dependencies and hence the speed of execution can be optimised. To do this there is a special algorithm which is almost, but not quite, First In First Out (FIFO). Choosing which micro-operations to execute and in which order is complicated by the large number of jumps found in typical x86 programs; this is handled by the Branch Target Buffer which has the job of predicting branches.

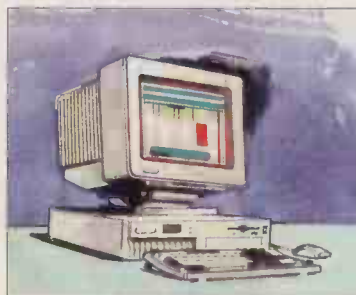
The final stage is Retire. This looks for micro-ops which have been executed and can be removed from the pool, updating the flow to put everything back into the original program order. It takes two cycles for the retirement unit to do this but the P6 is capable of retiring three micro-ops per cycle.

There is no point in having an information factory unless it can be kept fed with data. Intel has solved this by putting a 256kb Level 2 cache into the same package. MIPS has a chip, the R10000, which has a socket on the CPU package to allow a cache to be added, but the P6 will be the first time both chips have been twinned. The Intel and MIPS approaches both have the advantage of speed. The close coupling of the CPU and L2 cache helps improve performance by allowing both chips to run at the full clock-speed rather than the fractional bus speed.

But no-one, not even Intel, really knows how well all this works. It sounds good, but then so did the Pentium at this stage of announcement. The price and name are yet to be revealed but traditionally, new Intel processors have been launched at around the \$1,000 mark. The Pentium 100 is now \$700 which leaves a bit of headroom, but the P6 is likely to be even more expensive since it includes the cache. I'd guess an initial price of around \$1,500. This is expensive, but then so is a Ferrari.

PCW

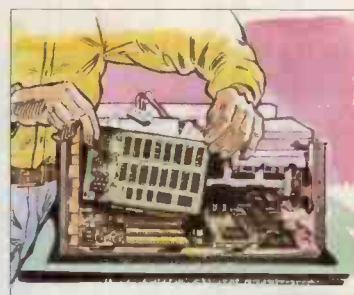




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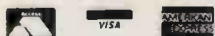
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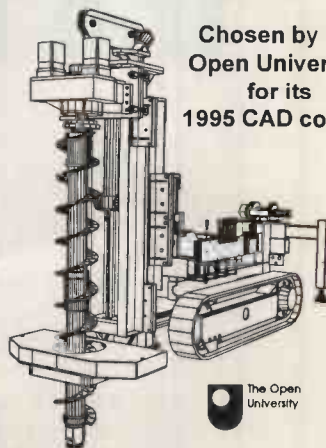
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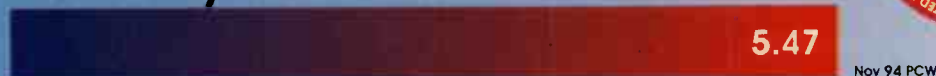
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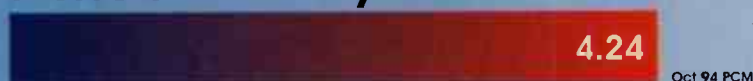
## Overall Systems Test Results



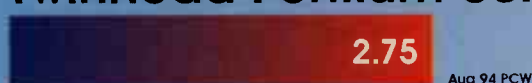
### Gateway Pentium 100MHz



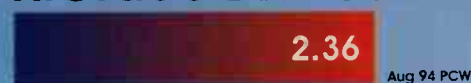
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# From animals to animats

**Computing is fundamentally about simulation, but the problem of mimicking intelligent behaviour has proved very hard indeed. Nick Beard contrasts the classic "grand plan" approach with the new "animats" method of behaviour-based computing.**

**C**omputing encompasses a diverse range of processes: from a cricketer's unconscious calculation of where to run to catch a ball, to an accountant's quill scratchings; from the nuclear physicist's massively parallel number-crunching efforts to the PR-person working on a presentation about magazine reading habits.

All these people are doing computing but not all of them realise it — certainly not at the time. What do they have in common? This: the central, oft unstated purpose of computing, which is to make some small portion of the world (usually, but not always, your computer) behave, in certain critical aspects, like some other piece of the world. So computing is fundamentally about simulation.

The challenge of computing is to find the best ways of making one piece of matter behave like another. What is the best way to make a lump of silicon mimic the economy? Or to mimic our brains? Or to behave like an animal (of some species or other) in various respects of interest? One way is to write down, in an artificial language (C, Fortran, Visual Basic) the things the computing device must do to behave like something else. Where the problem is mimicking intelligence — surely our rarest and most valued commodity — this is the approach of "classical" artificial intelligence.

## In the soup

Another way is to create a computational environment where the ability to compute emerges from a "data soup". What is the best model for this environment? This depends on the problem to be solved. Here we look at emergent

of that environment (seeing, hearing etc), constructing a plan of action to achieve a specific goal (how am I going to get around that cat — which might wake up and stretch — to collect that Coke can) and efficient and controlled motion.

These problems, largely, remain with us. The problem of mimicking intelligent behaviour has proved very hard indeed. The "grand plan" approach has been supplemented by an alternative method, the "animats" approach: behaviour-based computing.

## Purpose in life

Here is an example which illustrates the difference between these two approaches. Consider a robot: a big, shiny, metallic Michelin-man thing, with flashing lights and a pointless simulated voice. It must have some in-built purpose, something that drives it to do more than sit in the corner and hum. "Keep the laboratory clear of empty cola bottles" would do.

Unfortunately, the sheer diversity of scenarios that a robot would have to cope with when roaming a lab looking for rubbish would be enormous. Plus, the apparent layout of the place may change regularly, scientists being an untidy lot. The classical AI "grand-plan" approach would involve building and maintaining a detailed map of the lab, and recognising, categorising and "understanding" almost everything experienced. There are tricks which help reduce the



behaviours and their application to robotics, simulation and other areas of computing.

Consider robotics and the constructive imitation of human behaviour. In 1990, eminent computer scientist John Hopcroft and his colleagues published a discussion of the core set of scientific problems still to be solved for flexible, truly effective robotics to be feasible. Among them was robust, versatile modelling of the environment (giving the machine an internal representation of the world in which it operates), interpreting sensory data to establish the state



computational load, such as summarising and grouping scenarios into a more manageable number.

In contrast, the behaviour-based approach would not have a map of the lab but a set of simple behaviours preprogrammed into the robot. One might be "walk forwards until close to something, and then stop and turn left"; another would concern "person avoidance" so as not to crush passing scientists. Another might be "power monitoring", to ensure return to a power socket to recharge batteries. A simple binary "empty coke-bottle/not-[empty coke-bottle] monitor would sit watching for prey. The system has no idea what the overall plan is, just a set of behavioural widgets, maybe where each has a different priority.

The behaviour-based alternative approach is at first sight more dumb, but with an outcome which can be smarter and cheaper — at least computationally. Behaviour-based approaches have no central planner or controller and therefore do not rely on overall representations. Instead, coherent behaviour emerges from the independent actions of the constituents. Although it would not look like the clichéd silver Robbie the Robot, such an object fetcher could now be built on the basis of this approach. Connell did precisely this in 1990.

Although useful demonstrations have been developed, the problem is that as the number of sensors and actuators (things which do stuff) increases, coherence in the absence of a central planner is tough to maintain. To date, no-one has built really complex behaviour-based systems. The best so far have been basic navigation tasks, sometimes supplemented by the ability to pick up simple objects. Truly interacting with the world, manipulating their environment — these things are beyond current (artificial) behaviour-based systems, yet we know they can be done: just watch ants.

Swarm intelligence is the goal of this realm of simulation. The engineering problem lies in the balance between simplicity of design — the desire to have systems

built of simple independent, basic behaviour units — and maintenance of overall coherence: the control of movement towards "global goals".

Rodney Brookes, one of the leading figures in this area, is developing a robot called COG. His approach included a change in emphasis from that of much of the work in the field of behaviour-based robotics. The predominant preoccupation thus far has been with action selection — how to prioritise competing actions and thus to determine the apparent overall behaviour of the system as a whole. Brooks now argues for coherence maintenance to be the focus, which requires developing an approach to overall control which does not involve the computational complexity (and thus cost) of a "central planner".

As ever, a smart place to look for clues on how to "do" intelligent behaviour is the brain. While the brain is made up of many, many apparently "independent" units (at various levels — individual cells or neural substructures such as the limbic system), there are still global communications systems. The entire brain can be bathed in fluid into which chemicals are pumped to give an "overall status report". COG, then, has a mechanism for release and distribution of a global dissipative substance which affects the state of the entire robot. (Global, because it reaches the whole computational "engine" of the beast, dissipative in that their actions subside (dissipate) over time, and substances because that is what they are mimicking: brain chemicals). Whether this is enough to provide the coherence required remains to be seen.

#### Robot herds and lattice swarms

These approaches are attractive because the basic units of behaviour can be represented and evolved inside a computer. In contrast, classical AI's grand schemes are simply too big and complex for an effective evolution-mechanism to be implemented. It is theoretically possible but a "meta-representation" would be needed — a method of representing methods of representation! This would be computationally complex and the computer running it would need to be fed an awful lot of MIPS! Instead, the more simple "computational sub-units" of behaviour-based approaches allow the increasingly well understood and powerful techniques of genetic algorithms and genetic programming to be applied (see Bluesky's past and even *Frontiers* before that).

These techniques use simulated evolution to develop better and better solutions to computational problems. This is already being applied to a variety of topics in two distinct areas: studying real (living) systems by simulation, and attacking engineering problems by trying solutions based on biology.

Craig Reynolds of Electronic Arts in San Mateo, California, developed a model of how corridor following skills could be evolved by "breeding" vehicle controllers. In previous work, the obstacle avoidance strategies had been evolved using identical fitness tests. The "skills" acquired were very brittle: as soon as the problem was adjusted, the skills were no longer applicable. This is like repeatedly firing a tennis ball along exactly the same path, and expecting the trainee to learn good general tennis skills by returning the ball successfully.

To combat this, Reynolds added noise to the tests. The result was a far more robust controller.

Reynolds's work was confined to the innards of a computer. At the University of Sussex, Inman Harvey and colleagues have been building — evolving — robot controllers which are effective at visually controlled tasks. "Robot herds" have been built (simulated of course — see *Jurassic Park!*) and a French team (Eric Bonabeau *et al*) have emulated building behaviour in lattice swarms to model how swarms such as wasps construct nests.

Pascale Kuntz and Dominique Snyers at Telecom Bretagne have attacked the classical optimisation problem of graph partitioning by transforming it into a problem of the co-adaptation of species. The emergent colonisation displayed by the artificial society of animats coincides with the solution to the underlying mathematical problem.

As complexity in hardware and software becomes increasingly difficult to manage, these techniques — a key element of applied emergent computation — will become increasingly important in the effort to control and exploit technology. Who knows what might evolve in that machine on your desk?

#### PCW Resource Guide

##### From animals to animats 3

Dave Cliff *et al* (Eds) MIT Press (1995)

Another excellent survey of the state of the art in this important overlap between biology and engineering. A wide range of interests, from artificial intelligence and robotics to ethology and the neurosciences. Eclectic and excellent.

##### Artificial Life IV

Rodney Brooks and Pattie Maes (Eds) MIT Press (1995)

Proceedings of the Fourth International Workshop on the Synthesis and Simulation of Living Systems. Artificial Life is less and less a subject from the edge of science, and is becoming a part of biological research. This is *the latest* on the subject.

##### Minimalist Mobile Robotics: A Colony Style Architecture for a Mobile Robot

J Connell, Academic Press (1990)



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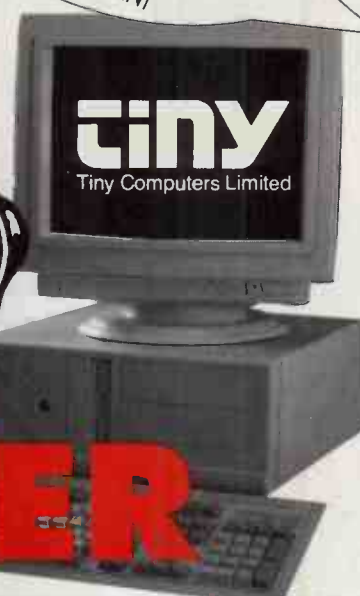
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| *Photoc onductor Unit              | Fuser    | TONER | DRUM |
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| *Photoc onductor Unit                               | Fuser    | TONER | DRUM |
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| HP IIP / IIIP                                       | (92275A) | £35   |      |
| HP 4L / 4ML / 4P / 4MP                              | (92274A) | £34   |      |
| HP 4 / 4M   | (92298A) | £59   |      |
| HP IIISI / 4Si                                      | (92291A) | £62   |      |
| Nec Silentwriter S60P/S62P/S102P                    | £70      |       |      |
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# Oh, to own a lisa

CUTTING EDGE

**While most ten-year-old PCs have all the high-tech appeal of a Penny Farthing, Apple's Lisa could still teach its modern counterparts a thing or two, writes Simon Rockman.**

Sometimes, we get it right. Sometimes, *PCW* predicts that a new technology will be the thing of the future, and it actually turns out that way. Perhaps the greatest triumph in this respect was at the time of the Apple Lisa in July 1983, when *PCW* declared that we were entering the era of the mouse. The view of the original review, a *PCW* exclusive, that the most important thing was the software, followed by the hardware, was remarkably perceptive for the time.

Looking back in these retro columns the technology often seems charming and quaint. But with the Lisa it is the reviewer's reaction to icons, mice and menus which seems strange. Robin Webster and Leslie Miner travelled to Cupertino to see the first of the Lisas, and many of the ideas, like windows, which now seem natural, then seemed strange. Some things have changed — the Lisa didn't have slider bars for options, crude radio buttons were used in the preferences setup and the use of GUIs by programmers has improved, but most of the basics were there from the start.

One interesting inclusion was a set of six standard packages; LisaCalc, LisaWrite, LisaDraw, LisaGraph, LisaProject and LisaList. In the review, the example for LisaCalc showed projected sales for the Apple IIe, Lisa and the Apple III. The latter

sunk rapidly, but that's not what the graphs show.

The applications seem very crude today. The spreadsheet was only 256 cells by 256, the draw package didn't offer fill patterns and the database could only cope with 600kb of data. And yet I'd really like one.

Even 12 years on it looks more modern than any of the PCs on desks in the *PCW* office. The keyboard is unfettered by function, scroll lock and associated keys. Modern machines seem smothered with buttons.

The ultimate downfall of the Lisa was its price. At a time when a CP/M machine with a hard disk and mono screen was £3,500, the Lisas, at \$9,995, were outrageously expensive. The insides were stuffed with boards to cope with the massive 1Mb RAM the system required. The 68000 CPU ran at 5MHz and the machine had an external 5Mb hard disk to supplement the strange floppy disks. This is how the review described the 5in drives in the Lisa:

"Rather than having both heads positioned so that the disk media is pinched between them, increasing wear, the Apple drives have offset heads and special opposing pressure pads that access the disk surface through two cut-outs in the disk jacket". In the review *PCW* wondered "what kind of production arrangements Apple has made". In practice the eccentric floppies proved to be a bad idea and were



*The Lisa: it wouldn't look out of place on a desktop today*

dropped in favour of conventional 5-in disks, but even then the drives were still special in that they didn't allow the user to remove the disk manually; the disk was only ejected if the software allowed it. "Before anything else is done the Desktop Manager checks to see what files are open and sets about closing them. Once everything is cleared from the desktop, the disks are automatically ejected." Today it seems odd that this idea is still special. Anyone who has been stuck in an endless loop because a disk has been removed when running Word for Windows would argue that the 12-year-old Lisa is technologically ahead of a modern PC.

I often dig back through *PCW* and have always thought how crude the machines seemed in the days when I read the magazine at school. The Lisa is the first blast from the past which doesn't seem quaint. I talked to a friend who

has one and it is very slow, taking ages to boot. The software is a little crude and it all feels a bit steam-driven, but it doesn't have the antique feel of an original PC or a Z80-based machine.

It genuinely was a pointer to the future in which we are now living.

PCW







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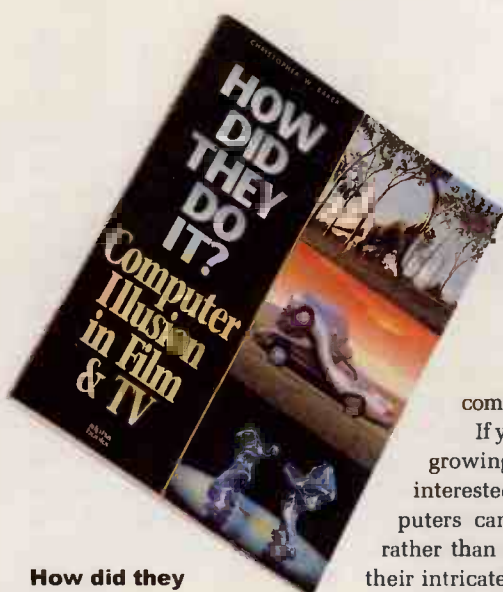
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## BOOKS



**How did they do it?**

**Computer Illusion in Film & TV**

Author: Christopher W Baker

Publisher: Alpha Books

ISBN: 1-56761-422-1

Price: £18.50

Rating: ➔ ➔ ➔ ➔ ➔ ➔

**H**ow did they do it? Computer Illusion in Film & TV is one of the best general interest/computer books I've seen. It sidesteps the obligatory "...and all these switches together make a microprocessor and that's how computers work..." introduction and goes straight to the point — explaining how specific tricks in famous films, commercials or works of art were done.

The book is crammed full of glossy, high quality illustrations and detailed explanations of the production process behind many of the well known uses of computers in film and TV. The examples are well, chosen, quite fresh (the book includes examples from Terminator 2, Death Becomes Her, Jurassic Park and several currently running American TV commercials) and quite unpretentious. The book is a good read even in those cases where you are unfamiliar with the example being discussed.

The price of £18.50 is fairly low for the computer book market, which might suggest that the book is aimed at a far wider market of people just marginally interested in

computers. Good stuff.

If you are one of that growing group of people interested in what computers can do in real life rather than what they are in their intricate technical detail, this is an excellent book for you. If you just want an extraordinarily interesting coffee-table book that will make your guest say "Wow", this is, again, worth having.

**Jelena Rupnik**

**Masters of Deception**

Author: Joshua Quittner,

Michelle Slatalla

Publisher: Vintage

ISBN: 0-09-957681-3

Price: £6.99

Rating: ➔ ➔ ➔ ➔ ➔ ➔

**T**he hacker subjects of this book didn't like it much, but it's hard to see why. This is a rose-tinted account of electronic gang warfare where Acid Phreak, Phiber Optik and Scorpion are digital desperadoes of the wired west. They take on the authorities and... well,

that's the point of the book.

Hacking is something you grow out of. It scares people because adolescent boys with power are dangerous, but the Joshua Quittner and Michelle Slatalla have managed to view the events of the mid-eighties as an exciting jape. The hackers are portrayed as being super-smart kids from the slums and the investigators as fat New York cops who live in a cloud of cigarette smoke. It's very clear who are the goodies and who are the baddies so it seems strange that the hackers in white hats should get upset.

The "gee-whiz" pace of the book gets a bit tiring after a while as one hacker exploit is presented after another. The boys clearly know what they're doing but the book is condescending about the way the exploits are boasted about in "philes", text files posted on bulletin boards, and then boasts about the same exploits in print.

Tales of the heroes of the book, the Masters of Deception (MOD) and their battle

with a rival gang, the Legion of Doom, provide a bit of colour, but most of the technical aspects are hidden behind an attitude of "wow, a kid who can use a VAX or Unix".

The narrative soon turns to the events which led up to the hacker crackdown, building a case for the defence before one is needed but charting the mistakes the MOD made as they made them.

This isn't a book about computers: there's a tiny amount of computing in there and a little more on telephone systems and how telephone networks work, but ultimately it's a book about people, 15-year-old boys, and so has a strong "Lord of the Flies" feel. It's a good read, and the descriptions of what went on with the US secret service sound very similar to what went on in the UK when hackers here were busted; if anything, the US agents were a little more gentle, although they did carry guns. But the fear of getting busted never stopped anyone from hacking.

At £6.99 it's a pleasant book to read on the beach but don't expect to learn how to hack a computer system from it.

**Simon Rockman**

**Tin Men**

Author: Michael Frayn

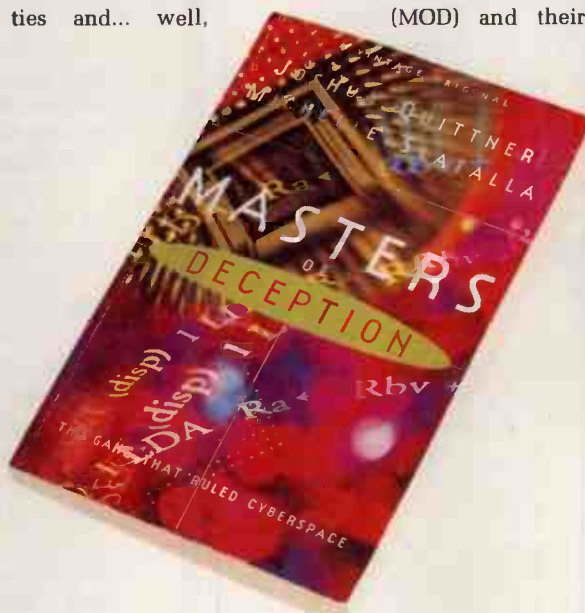
Publisher: Penguin

ISBN: 0-14-024279-1

Price: £5.99

Rating: ➔ ➔ ➔ ➔ ➔ ➔

**C**omputers are capable of much now that would have been impossible 30 years ago; but writing pornographic novels and news stories, creating imaginary sports scores and making ethical decisions? The stuff of fantasy, you might say,





or else the imaginings of Michael Frayn.

The plot evolves around the William Morris Institute of Automation Research. Here the various departments, including ethics, sport, politics and fashion, vie to create a computer capable of carrying out human functions — in other words, artificial intelligence research run wild.

In the ethics department robots are built with the ability to make "moral" decisions — whether to sacrifice themselves or kill someone else when

faced with drowning. In the sports department, computers are planned that will relieve their human counterparts of the tedium of either playing or watching sport.

Work in other departments goes on in fairly desultory fashion as the researchers are more interested in their own human projects. The chief researcher in the sports department is writing his own novel with little success, while his colleagues try to persuade him he would have better results if he did it by computer.



Meanwhile, the head of the politics division is so deeply embroiled in internal politics and committees that she has little time to devote to their research. The researchers' ultimate goal is for machines to take over most human tasks, but are they really capable of

these things?

Problems start to appear with the announcement that the Queen is to open the new ethics department. This is where Michael Frayn's other occupation, writing farces, comes into its own. *Tin Men* is a farce novel — highly entertaining but with very little basis in reality. It was his first book, now 30 years old, and this does show in places, but it is weird to see how far we have come and how far we have to go.

**Adele Dyer**

## COMPARATIVE REVIEWS: MICROSOFT OFFICE

### Using Microsoft Office 4, the User-Friendly Reference

Author: Ed Bott  
Publisher: Que  
Pages: 412  
Price: £18.49  
ISBN: 0-7897-0091-3  
Rating: ♦♦ ♦♦ ♦♦ ♦♦

### Making Microsoft Office Work

Author: Ralph Soucie  
Publisher: Osborne McGraw-Hill  
Pages: 427  
Price: £18.95  
ISBN: 0-07-881188-0  
Rating: ♦♦ ♦♦ ♦♦ ♦♦

### The Ultimate Microsoft Office Book

Author: Eric Stroo  
Publisher: Microsoft Press  
Pages: 323  
Price: £21.95  
ISBN: 1-55615-659-6  
Rating: ♦♦ ♦♦ ♦♦ ♦♦

### Microsoft Office for Windows

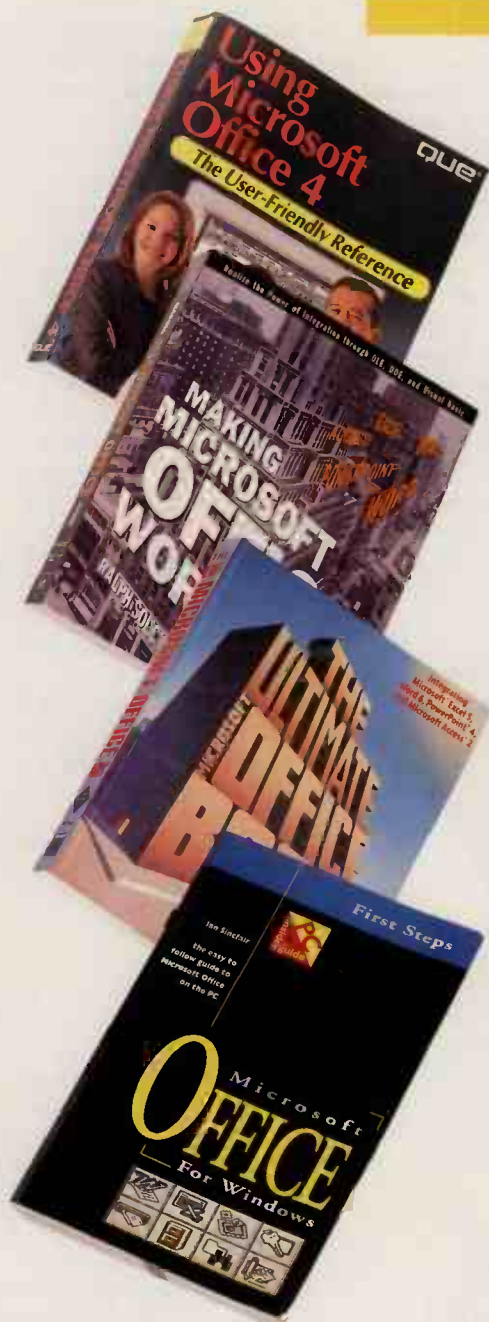
Author: Ian Sinclair  
Publisher: Bruce Smith Books  
Pages: 336  
Price: £14.95  
ISBN: 1-873308-29-9  
Rating: ♦♦ ♦♦ ♦♦ ♦♦

Integration may be the name of the game with the big office suites, but the manual authors haven't figured this out yet: Microsoft Office ships with a separate manual for each component product. Accordingly, books that tell you how to put the individual programs together to take advantage of their common features seem like good value.

Until recently, St Albans-based Bruce Smith Books was a specialist in books about the Amiga; now it's broadened the focus of its First Steps series. Microsoft Office for Windows is one of its first PC titles. Realistically, very little of the material is specifically UK-related: this isn't like a book on comms or personal finance, where the information that needs to be covered is radically different.

Along with streamlined guides to Word, Excel, PowerPoint and Access, Sinclair goes through some ancillary information: how to gain more hard disk space (add a hard drive, use DriveSpace, delete files), and file management. Other chapters look at using the programs together — linking or embedding Excel worksheets in Word; using Word outlines to create presentations in PowerPoint; using Access data in the other applications.

The main difficulty with this book is Sinclair's writing style, which suffers from an overuse of the passive voice, resulting in tangled sentences. The content is a bit idiosyncratic (the discussion of Print to File and Print Preview are longer than the one on the main printing options), but at least it's aimed squarely at a British audience, as in his discussion of how to make sure your printer is set up to handle pound signs. Boxouts called "Insider Guides" handle this kind of material, which includes a





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2 par.) 1 games port, 102 key keyboard, 3 button mouse, Windows 3.11,  
DOS 6.22 (full versions supplied). Multimedia option consists of Creative  
Soundblaster 16 Value, Panasonic 56k Double Speed CD-ROM & Speakers.  
**486 Systems** **420Mb** **540Mb** **730Mb** **M/Media**  
u486 VLB SX-40MHz 749 769 799 +170  
u486 VLB DX2-66MHz 839 859 889 +170  
u486 VLB DX4-100MHz 899 919 949 +170  
Pentium systems as above with the following changes +4PCI/2VLB/5ISA  
256K CACHE Motherboard, 8Mb RAM.  
**Pentium Systems** **420Mb** **540Mb** **730Mb** **M/Media**  
Pentium 60MHz 1149 1169 1199 +170  
Pentium 66MHz 1169 1189 1219 +170  
Pentium 90MHz 1299 1319 1349 +170

Please call for configurations not listed.

### Compaq Presario

|        |      |             |      |
|--------|------|-------------|------|
| 460    | 788  | CD5510      | 1004 |
| CD5520 | 1069 | CD5633 M200 | 1145 |
| CD5660 | 859  | 720         | 1003 |
| CD5720 | 1146 | CD5860      | 1395 |
| 920    | 1146 | CD5920      | 1290 |

### Compaq Desktop PC's

|                                       |      |
|---------------------------------------|------|
| ProLinea 4/33s M200w (base unit only) | 664  |
| ProLinea 4/33s M340w (base unit only) | 740  |
| ProLinea 4/50s M200w (base unit only) | 824  |
| ProLinea 4/50s M340w (base unit only) | 900  |
| ProLinea 4/66 M200w (base unit only)  | 1035 |
| ProLinea 4/66 M340w (base unit only)  | 1111 |
| ProLinea 4/100 M340w (base unit only) | 1279 |
| ProLinea 4/100 M525w (base unit only) | 1338 |

### Compaq Monitors

|                      |     |                      |     |
|----------------------|-----|----------------------|-----|
| SVGA Colour Monitor  | 215 | 1024 Colour Monitor  | 250 |
| 1515F Colour Monitor | 339 | 1715F Colour Monitor | 658 |

### Compaq Notebooks

|  |      |
|--|------|
| Contura Aero 4/33c M170w with Disk Drive | 1189 |
| Contura Aero 4/33c M250w with Disk Drive | 1359 |

### Toshiba Notebooks

|              |      |              |      |
|--------------|------|--------------|------|
| T1910/200 *  | 949  | T1910c/120 * | 1279 |
| T1910c/200 * | 1369 | T1950c/200 * | 1889 |
| T1950c/320 * | 2023 | T2400c/250 * | 2578 |
| T2400c/320 * | 2023 | T2400c/320 * | 2578 |
| T3400c/120 * | 1717 | T3400c/250 * | 2148 |
| T3600c/250 * | 2664 | T4600c/200 * | 2712 |
| T4600c/320 * | 2970 | T4800c/200 * | 3439 |
| T4700c/320 * | 3697 | T4800c/500 * | 4175 |

\* includes windows & trackball

### Laser Printers

#### Hewlett Packard

|                      |      |                          |      |
|----------------------|------|--------------------------|------|
| Laserjet 4L          | 389  | Laserjet 4ML             | 737  |
| Laserjet 4P          | 595  | Laserjet 4NP             | 855  |
| Laserjet 4+          | 940  | Laserjet 4M+             | 1265 |
| Laserjet 4V          | 1365 | Laserjet 4MV             | 1990 |
| Laserjet 4Si         | 2095 | Laserjet 4Si Mx          | 2995 |
| 4L/4M 3 Year OSM     | 99   | 4P/4M 3 Year OSM         | 135  |
| 4V/4M 3 Year OSM     | 170  | 4V/4M 3 Year OSM         | 220  |
| 4Si/4SiMx 3 Year OSM | 505  | Call for memory upgrades |      |

#### Panasonic

|          |     |          |     |
|----------|-----|----------|-----|
| KX-P4400 | 280 | KX-P4401 | 345 |
|----------|-----|----------|-----|

#### Star

|     |     |              |     |
|-----|-----|--------------|-----|
| L55 | 365 | WinType 4000 | 299 |
|-----|-----|--------------|-----|

## Dot Matrix Printers

#### Citizen

|                 |     |                   |     |
|-----------------|-----|-------------------|-----|
| ABC 24          | 108 | ABC 24 Colour     | 125 |
| Swift 90 Mono   | 115 | Swift 90 Colour   | 122 |
| Swift 200 Mono  | 138 | Swift 200 Colour  | 147 |
| Swift 240 Mono  | 156 | Swift 240 Colour  | 178 |
| Swift 9x        | 169 | Swift 24x         | 189 |
| Swift 90 ASF    | 80  | Swift 200/240 ASF | 65  |
| Swift 9x24x ASF | 119 |                   |     |

#### Epson

|              |     |            |     |
|--------------|-----|------------|-----|
| LX300        | 89  | LX100      | 105 |
| LX1050       | 172 | LQ150 Mono | 115 |
| LQ150 Colour | 145 | LQ300      | 146 |
| LQ570+       | 185 | LQ870      | 349 |

#### Panasonic

|                 |     |          |     |
|-----------------|-----|----------|-----|
| KX-P1150        | 90  | KX-P2023 | 109 |
| KX-P2135 Colour | 131 | KX-P2124 | 202 |
| KX-P2124 Colour | 221 | KX-P1695 | 267 |
| KX-P1624        | 199 | KX-P3626 | 285 |

#### Star

|           |     |              |     |
|-----------|-----|--------------|-----|
| LC90      | 83  | LC100 Colour | 90  |
| LC240     | 96  | LC240C       | 110 |
| LC240 II  | 113 | LC240 CL     | 147 |
| LC240-300 | 179 |              |     |

## Inkjet Printers

#### Canon

|         |      |        |      |
|---------|------|--------|------|
| BJ200   | 179  | BJ230  | 237  |
| BJ300   | 365  | BJ330  | 399  |
| BJC4000 | 275  | BJC600 | 329  |
| BJC800  | 1070 | BJC820 | 1227 |

#### Epson

|               |     |             |     |
|---------------|-----|-------------|-----|
| Stylus 400    | 135 | Stylus 800+ | 170 |
| Stylus Colour | 327 | Stylus 800  | 419 |
| Stylus 1000   | 310 | SQ1170      | 559 |

#### Hewlett Packard

|                    |     |                    |      |
|--------------------|-----|--------------------|------|
| Deskjet 320        | 165 | Deskjet320 + ASF   | 184  |
| Deskjet 320 ColKit | 28  | Deskjet 520        | 199  |
| Deskjet 520        | 199 | Deskjet 560        | Call |
| Deskjet 560 Colour | 331 | Deskjet 560 Colour | 375  |
| Deskjet 1200C      | 645 | Deskjet 1200C PS   | 1015 |
| DJ/DW Mono OSM     | 40  | DJ/DW Mono OSM     | 65   |

#### Star

|       |     |              |     |
|-------|-----|--------------|-----|
| SJ-48 | 140 | SJ144 Colour | 179 |
|-------|-----|--------------|-----|

## Handhelds

### PSION

|                      |     |                     |     |
|----------------------|-----|---------------------|-----|
| Series 3a 512k       | 225 | Series 3a 256k      | 175 |
| Series 3 128k        | 108 | Series 3 256k       | 145 |
| 128k Flash SSD       | 26  | 128k RAM SSD        | 39  |
| 256k Flash SSD       | 39  | 512k RAM SSD        | 96  |
| 512k Flash SSD       | 64  | 1Mb RAM SSD         | 188 |
| 1Mb Flash SSD        | 88  | 2Mb Flash SSD       | 138 |
| 4Mb Flash SSD        | 255 | 3Fax Fax/Modem      | 159 |
| PC Comms Link        | 44  | Mac Comms Link      | 55  |
| Leather Wallet       | 18  | Pouch Wallet        | 9   |
| Spreadsheet          | 49  | Chess               | 38  |
| Spellcheck/Thesaurus | 29  | Games Pack 1        | 21  |
| Games Pack 2         | 21  | Games Pack 3        | 23  |
| Data Deluxe          | 49  | Psion Money 3a      | 39  |
| Berlitz Interpreter  | 26  | Berlitz Phrase Book | 35  |

### Amstrad

|            |     |       |     |
|------------|-----|-------|-----|
| PenPad PDA | 219 | NC200 | 242 |
|------------|-----|-------|-----|

## Multitech

### Multitech

|                      |     |                         |      |
|----------------------|-----|-------------------------|------|
| ZDX 19.2 VTerbo Ext  | 149 | MT2834BLK Vfast         | Call |
| Linnet 2400 Ext      | 80  | Linnet Quail FX         | 99   |
| Linnet 32 FX+        | 185 | Linnet 32 VFX           | 239  |
| Linnet V34 VFC       | 290 | Microfax 2400 + fax     | 76   |
| Microfax 14400 + fax | 110 | Microfax Pocket Fax/Mod | 85   |
| Microfax FX Portable | 99  | Microfax FX PC Card     | 85   |
| Microfax FX32+ Int   | 139 | Microfax FX32+ Ext      | 150  |
| PCMCIA FX/M 32+      | 199 | PCMCIA FX/M 24          | 139  |

### Psion Dacom

|                      |     |                      |     |
|----------------------|-----|----------------------|-----|
| Gold Card V32 + fax  | 199 | Gold Card V32 bis+fx | 210 |
| Gold Card PCMCIA VFC | 305 | Gold Card V34 + fax  | 239 |
| Meteor 14.4          | 179 | Meteor 28.8          | 245 |

### US Robotics

|                         |     |                    |     |
|-------------------------|-----|--------------------|-----|
| Sportster 14.4 Ext      | 128 | Sportster 28.8 Ext | 195 |
| Sportster 14.4 Int      | 135 | Courier V32bis     | 315 |
| Courier V34             | 285 | Cellular PCMCIA    | 210 |
| Dual Cellular Port      | 220 | Pocket 14400/Fax   | 178 |
| Courier V34 PCMCIA 14.4 | 215 |                    |     |

9-25 & 25-25 2 Metre Modem Cables are available @£5

## Fax

### Amstrad

|        |     |        |     |
|--------|-----|--------|-----|
| FX7000 | 189 | FX8500 | 290 |
|--------|-----|--------|-----|

### BT

|       |     |       |     |
|-------|-----|-------|-----|
| DF100 | 209 | DF200 | 280 |
| DF300 | 314 | DF400 | 369 |
| BF500 | 465 | DF800 | 799 |

### Panasonic

|        |     |        |      |
|--------|-----|--------|------|
| UF-V40 | 259 | UF-V60 | 349  |
| UF280M | 785 | UF321  | 649  |
| UF322  | 769 | UF755  | 1469 |

### Samsung

|        |     |              |     |
|--------|-----|--------------|-----|
| SF40   | 185 | SF500        | 209 |
| SF800  | 249 | SF1505       | 269 |
| SF2800 | 299 | SF5500 Laser | 739 |

## Tape Backup

### Colorado

|                 |     |                 |     |
|-----------------|-----|-----------------|-----|
| Jumbo 250Mb Int | 89  | Jumbo 250Mb Ext | 204 |
| Jumbo 350Mb Int | 125 | Jumbo 350Mb Ext | 188 |
| Trakker 250Mb   | 190 | Trakker 350Mb   | 220 |
| Trakker 700Mb   | 305 | Controller Card | 45  |
| DC-2120 Tapes   | 10  | 700Mb Tapes     | 18  |

### Conner

|              |     |              |     |
|--------------|-----|--------------|-----|
| 420Mb Int    | 125 | 850Mb Int    | 225 |
| 2GB SCSI DAT | 599 | 4Gb SCSI DAT | 649 |
| 8Gb SCSI DAT | 729 |              |     |

### Imagem

|                    |     |                    |     |
|--------------------|-----|--------------------|-----|
| 250Mb Int          | 95  | 700Mb Int          | 269 |
| 250Mb Parallel Ext | 269 | 700Mb Parallel Ext | 299 |

## Multimedia

### Creative Labs

|                       |     |                          |     |
|-----------------------|-----|--------------------------|-----|
| Soundblaster V2 Value | 36  | Soundblaster Pro Value57 |     |
| SB 16 Value           | 67  | SB 16 Multi-CD Adsp      | 95  |
| SB 16 Multi-CD Adsp   | 115 | SB 16 SCSI-2 Adsp        | 115 |
| SB 16 SCSI-2 Adsp     | 136 | SB 16 AWE-32             | 175 |
| Waveblaster           | 99  | Videoblaster SE          | 175 |
| Videoblaster Dev Kit  | 55  | Videoblaster FS200       | 215 |
| Videoblaster RT300    | 259 | Video Assist             | 59  |
| TV-Coder              | 103 | 3DO Blaster              | 299 |

### Multimedia Packs

|                                   |     |  |  |
|-----------------------------------|-----|--|--|
| SB16 + CR56x (2xSd) + Active Spks | 175 |  |  |
|-----------------------------------|-----|--|--|

## CD-ROM / CDR

### JVC

|   |      |  |  |
|---|------|--|--|
| XR-2001E 2x Spin Speed CDR Internal Fitting | 1499 |  |  |
|---|------|--|--|

### Mitsumi

|                          |  |  |  |
|--------------------------|--|--|--|
| FX400 Quad Speed IDE 125 |  |  |  |
|--------------------------|--|--|--|

### Nakamichi

|  |     |  |  |
|--|-----|--|--|
| CD Juke Box - 7 CD's 2 x Speed SCSI External | 269 |  |  |
|--|-----|--|--|

### NEC

|                |     |                         |     |
|----------------|-----|-------------------------|-----|
| Quad Speed IDE | 139 | 4xi                     | 269 |
| 4xe            | 389 | 4x Pro                  | 629 |
| At Interface   | 62  | Parallel to SCSI (Port) | 90  |

### Panasonic

|                        |    |                            |  |
|------------------------|----|----------------------------|--|
| 562 2 x Speed Int. Kit | 95 | Interface Parv/Sony/Mir 10 |  |
|------------------------|----|----------------------------|--|

### Philips

|                                     |      |  |  |
|-------------------------------------|------|--|--|
| CDD522 Dual Spin Speed CDR External | 1699 |  |  |
|-------------------------------------|------|--|--|

### Ricoh

|                                     |      |  |  |
|-------------------------------------|------|--|--|
| RS1060 Dual Spin Speed CDR Internal | 1399 |  |  |
|-------------------------------------|------|--|--|

### Yamaha

|                                 |      |  |  |
|---------------------------------|------|--|--|
| CDRI001 Quad Speed CDR Internal | 2389 |  |  |
| CDRI002 Quad Speed CDR External | 2489 |  |  |

## CD-R Software / Blank Media

|                        |     |                     |     |
|------------------------|-----|---------------------|-----|
| WinOnCD                | 659 | WinOnCD To Go       | 149 |
| Corel CD Creator       | 129 | Toast Pro 2.5 (Mac) | 399 |
| 74Min Disc (Min Q1 10) | 6   |                     |     |

## PC Components

### HARD DISK DRIVES

Below are the latest moves please call for any drives not listed.

**Conner**  
CFA420A (420) EIDE 125  
CFA850A (850) EIDE 199  
CFA1257A (1.25G) EIDE 259

**Maxtor**  
7420A (420) IDE 120  
7546A (540) 169

**Quantum**  
LPS425 (420) EIDE 119  
MV540 (540) EIDE 139  
LPS730 (730) EIDE 159

**EMPT8005 (1.08Gb) SCSI** 399  
EMPT8005 (1.08Gb) SCSI 695  
EMPT1605 (2.1Gb) SCSI 774

**Adaptec SCSI Controllers**  
1505 59  
1515 75  
1542c 139  
1542c kit 179  
2842c VLB kit 199

**MOTHERBOARDS**  
486VLB 256K Cache 7 slots Inc. 3VLB Latest SIS 471 FULL  
DEEP Green Functions and Auto Frequency Synthesizer  
with a ZIF Socket 3 supporting Intel 486-SX / SX2  
DX / DX2 / DX4+ / ODP486 / 486SL Enhanced / P24T  
Pentium / AMD486+ / UMC / SG5 & Cyrix V2 CPU Family.  
\*Note DX4 needs 3.3V regulator.  
486PCI as above VESA/ISA/PCI 149  
Pentium 60/66 Intel Mercury Chipset PC/ISA+ 149  
Pentium 90/100 Intel Neptune Plato ISA/PCI+ with  
On-Board Fax IO & EIDE 209  
Pentium 90/100 Supremacy VESA/ISA/PCI+ 179

**PROCESSORS**  
Intel 486SX-33 59  
Intel 486DX2-66 115  
AMD 486DX2-80 125  
Intel Pentium 60 199  
Intel Pentium 66 219  
409

**CO-PROCESSORS**  
80387SX 41  
80387DX 49

**MEMORY SIMMS**  
1Mb x 9 x 3 x 30 way 26  
4Mb x 32 x 72 way 109  
8Mb x 32 x 72 way 129  
16Mb x 32 x 72 way 129  
8Mb x 36 x 72 way 369

**IDE/FDD 2x/1p/1g ISA** 10  
IDE/FDD VLB (16550A) 22  
MODE 3 VLB /IO 35

**FLOPPY**  
3.5" 1.44Mb 23  
5.25" 1.2Mb 35

**KEYBOARDS**  
12 Cherry Click 35  
Cherry Non-Click 32  
Microsoft Natural 69

**BRACKETS / CABLES**  
3.5-5.25 Bracket 5  
Twins Floppy Cable 5  
Power Splitter 5

**GRAPHICS CARDS**  
Cirrus 49  
5428 1Mb VLB 70  
5434 1Mb VLB 79  
31Mb 78900 ISA 45



disquisition on expanding your hard disk space, replicating formulas, using the Clipboard, and other such topics.

Que has decided to try to cater for relative beginners by producing a mini-series version of its big, black books. This title is somewhat disappointing: the bulk of the book simply covers the basics of the three applications in turn. There are a few short chapters on using the programs together, and a section at the end looks at customising Office and using the applets that come with the package such as WordArt and the ClipArt Gallery. It ends with a few pages on using Mail. These areas are left out of some books, and are nice to have.

This book is very clearly written and relatively well laid out. It's not as depressingly full of cuteness as most of the books aimed at beginners, which is a relief. There's still quite a lot, of course — the inevitable bad jokes about MOM (Microsoft Office Manager), too many occasions where it asks questions it's about to answer, and far too many headers with exclamation marks. Still, compared to some of these books it's relatively groanless.

Nonetheless, there isn't really quite enough to distinguish this book from the manuals. We were more impressed with *The Ultimate Microsoft Office Book*. It expects some of its readers to be beginners but it doesn't make the mistake of trying to duplicate the program manuals. It's also by far the jazziest book reviewed here. Where the other titles are solid black and white — Sinclair's book in particular is stiffly black and white with a minimum of white space, this book is littered with colours — box-outs, screenshots, even subject headings and photographs (it illustrated linking and embedding with a colour photograph of a kangaroo with a baby kangaroo in its pocket). It's lively but busy, just like the writing, which includes some of those awful jokes ("Setup, like orange

juice, isn't just for breakfast anymore").

Nonetheless, this book does a respectable job of explaining things like the difference between linking and embedding and when to use each, plus such basics as system performance and specification. It skips entirely the basics of using Office's individual applications, however, and heads straight for topics like sharing data, network routing, and graphics. You also get a chapter on printer problems, including printing envelopes and labels and troubleshooting. All this information is presented with a nice real-world spin; the focus is more on what you want to achieve than on how to use a given application or pair of applications. You're told straight out, for example, that you can create a table for a presentation in either Word or Excel, and when you might want to choose which — one of the most important

things to know about the whole business.

Making Microsoft Office Work skips right over beginners: it starts with OLE and moves on from there. Instead of basic tutorials to Word and Excel you'll find a few chapters on sharing data, querying databases and sending the results to Word and Excel, and graphics. You do get instructions on using Microsoft Query, Access, PowerPoint and Mail. Sending, routing and faxing documents gets a whole chapter.

The middle chunk of the book focuses on common office tasks, like creating sales reports and proposals and creating form letters from data stored in Excel and Access. The final chunk looks at advanced topics like building macros for Excel, technical problems, creating Visual Basic add-ons, and building an interface. All of this material is far more advanced than anything in the other books; it's also more

specifically aimed at whole businesses and their problems than at single users. It's impressive that even the complex material is clearly written and understandable.

Out of this group, if you want an introductory book you're probably best off with *The Ultimate Microsoft Office Book*, although Sinclair's book is a close contender because of its British content. On the more advanced level, *Making Microsoft Office Work* does a pretty good job.

Wendy M Grossman



### Top Ten Books: February 1995

| Author           | Title  | Publisher        | Price  | This | Last |
|------------------|--|------------------|--------|------|------|
| Lemay, Laura     | Teach Yourself Web Publishing with HTML in a Week          | Sams             | £19.50 | 1    | -    |
| Schofield, Sue   | The UK Internet Book                                       | Addison-Wesley   | £19.95 | 2    | 2    |
| Jennings, Roger  | Database Developer's Guide with Visual Basic 3 (Book/Disk) | Sams             | £41.67 | 3    | 4    |
| Schulman, Andrew | Unauthorized Windows 95                                    | IDG Press        | £28.99 | 4    | 1    |
| Krol, Ed         | The Whole Internet: User's Guide & Catalog, 2nd Ed.        | O'Reilly         | £18.50 | 5    | 3    |
| Ethington et al. | Introducing Microsoft Windows 95                           | Microsoft Press  | £11.99 | 6    | -    |
| Aronson, Larry   | HTML: Manual of Style                                      | Ziff Davis Press | £18.49 | 7    | -    |
| Bove & Rhodes    | Official Macromedia Director Studio (inc. CD-ROM)          | Random House     | £37.49 | 8    | -    |
| Ivar Jacobson    | The Object Advantage                                       | Addison-Wesley   | £24.95 | 9    | -    |
| Minasi, Mark     | Inside OS/2 Warp Version 3 (inc. CD-ROM)                   | New Riders Pub.  | £37.49 | 10   | -    |

Prices include VAT on Disks/CD-ROMs.

List supplied by The PC Bookshop of 11 & 21 Sicilian Avenue, London WC1A 2QH.

Tel: 0171 831 0022. Fax: 0171 831 0443.



# Personal Computer World Bookshelf Selection

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## THE WORLD WIDE WEB UNLEASHED ☐

John December et al  
The ultimate guide to the Web — its uses, resources, and tools — in complete detail.  
1994 400pp 0-672-30617-4 £31.50

## THE INTERNET UNLEASHED ☐

Steve Bang, Rick Gates, Martin Moore, et al  
This all-in-one guide targets the Internet navigator. It's packed with all the latest advanced techniques for exploiting all the Internet tools.  
1994 1,500pp 0-672-30466-X £37.60 (inc VAT)

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Peter Norton, Corey Sandler, Tom Badgett  
A completely updated version of this classic text focuses on the latest developments behind the case.  
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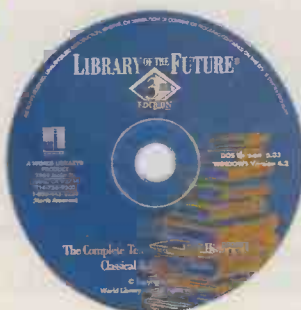
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# CD-ROMs

**Bookshelves straining under the weight of all those hardbacks? Bibliophile David Brake finds our glorious literary heritage takes up far less room on disc.**



## Library of the Future Vol 3

When I first looked at collections of literature on

disc, World Literary Heritage at £49 for Windows or the Mac seemed the best deal. Its interface was decidedly non-standard (it didn't give you a choice of fonts, for example) but it gave a fair assortment of literature including all of Shakespeare.

What I was really keen to get my hands on, though, was World Library's Library of the Future, Volume 3. This promised 1,750 literary titles

on a single disc, plus illustrations and even video. Sadly, it was not distributed in this country and cost £269.

Now, at last, World Library has a UK distributor and it has radically rethought its pricing. Library of the Future Volume 3 is now available in Mac, DOS and Windows versions for £99 including VAT, which means that home users as well as institutions can afford it, and volume 2 is still available at £49

including VAT for 950 titles, with an option to upgrade at cost.

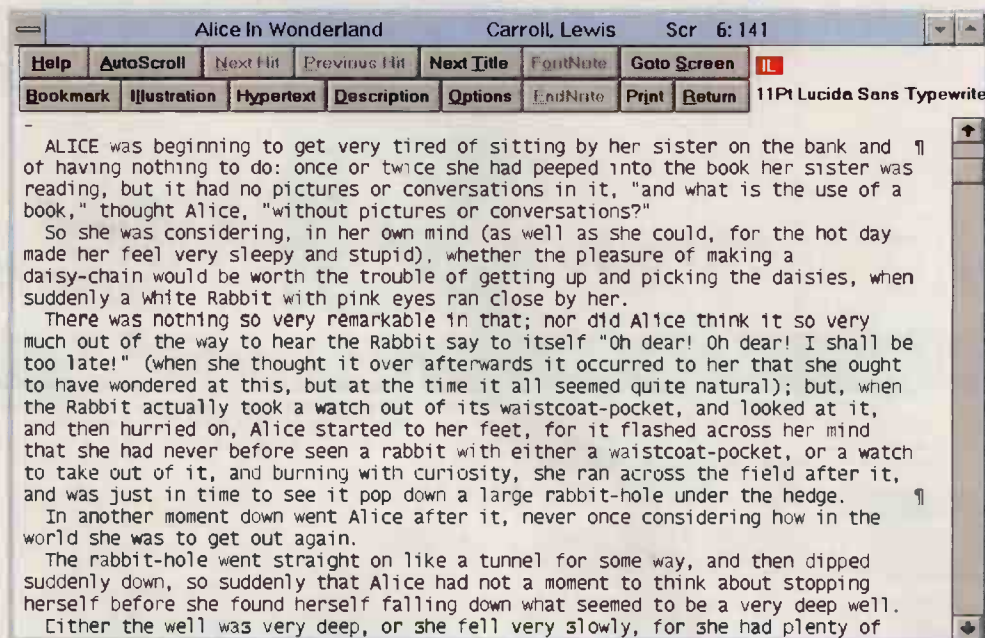
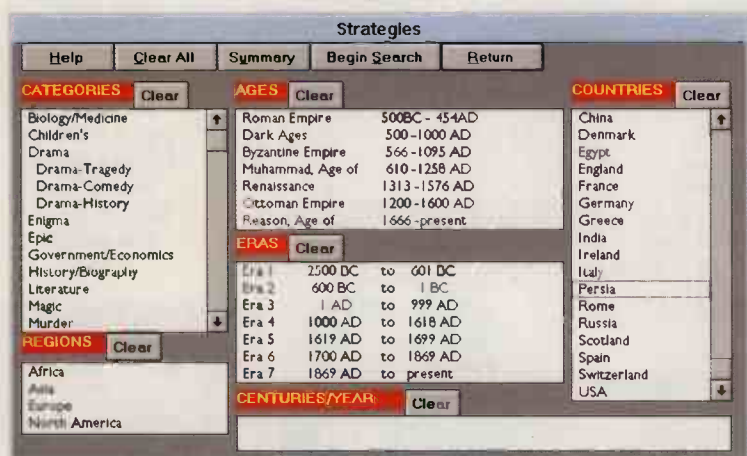
So, what does 1,750 literary works actually mean? Impressive as this sounds, it doesn't mean you get every work by every well known author. Middlemarch isn't here, or Martin Chuzzlewit, or Ulysses or any Trollope, though there are five Dickens novels and all of Shakespeare. Jane Austen is represented by *Pride and Prejudice* and *Sense and Sensibility*, George Eliot by *Silas Marner*, and Arthur Conan Doyle by no fewer than 61 Sherlock Holmes stories. Foreign literature is not entirely neglected, either. *Madame Bovary* is here, as are *War and Peace*, *Crime and Punishment*, and *Don Quixote*.

The Library of the Future isn't limited to fiction. It has an impressive collection of political, philosophical, ethical and early scientific texts, including the King James Bible, the Koran, the Communist Manifesto (but not *Das Kapital*), Freud's *Interpretation of Dreams*, Darwin's *Origin of the Species* and several works of Kant, including the *Critique of Pure Reason*.

The search engine lets you find documents using several different categories, time periods or countries. It will find, if you like, all the Danish works on the disc written between 1700 and 1869. It also lets you search by keyword, which is handy if you want to find the context of a quotation. The search works with remarkable speed. On a 20MHz 486SX with a double-speed CD-ROM drive it took just 30 seconds to search the whole disc.

What of the illustrations and video? They may have impressed a few years ago when CD-ROM was in its infancy, but now they look distinctly lame. There are 304 illustrations; 13 are of authors and the rest are shared between 50 books. There are also 12 short video clips from old and not particularly well known films. None of it is effectively

Left Library of the Future has a sophisticated search engine, but... Below its non-standard, ugly interface is a let-down





combined with the text of the stories. In the unlikely event that there is an illustration to go with a page, it is indicated with a little red flag and you are encouraged to click on the "illustration" button to flip to the associated image.

In fact, the presentation of the disc is distinctly second rate, at least in the DOS and Windows version I reviewed. It uses an odd, non-standard interface with no menus, only buttons; it only allows you to choose non-proportional fonts for display, and although it lets you adjust the size of your reading area it doesn't remember your settings. If I were using it regularly I would copy the book I was reading into my word processor and format the text there, using its built-in bookmark facility.

Library of the Future is a curious product. It's not pleasant to use and it seems absurd to even think about reading, say, Anna Karenina off a monitor. But for the bibliophile it's hard to resist the appeal of owning such a mountainous pile of reading — roughly 100 feet of bookshelf — on a single silver platter. The disabled could find it a boon too. You could make the writing as large as you like, or if you had a sound card you could have the computer read any of these texts to you without the trouble and expense of special book reading hardware. A fourth edition at half the price with an appealing interface and a few more recent writers would be a five-star disc.

Contact World Library

01993 778077

Price Vol 3 £84.25,

Vol 2 £41.70

Rating Vol 3 ●●●●○

Vol 2 ●●●●○



### Classic Library

Andromeda Interactive's Classic Library arrived at the last moment but I'm glad I had a chance to look it over, as in many respects it shows where Library of the Future should be heading. Its interface is miles better and this is evident as soon as you load it. Instead of a dull search page full of buttons, you find

yourself looking at a drawing room. Clicking on items in the drawing room causes a brief animation, then a dialogue box pops up. It's a bit of a gimmick but it gives a nice first impression.

The presentation of the text is better as well, and you can view it in any TrueType font on your system. It doesn't let you save many of your settings, though. If you have a favourite font and a favourite window size, you have to adjust each new window when you open it.

Library of the Future Volume 3 has a better collection than Classic Library, although it is difficult to judge which has the edge. Both are strong in the classics of English literature, which are at the core of their collections. Classic Library has four Austens to LotF's two, and four Hardy novels plus 17 poems while LotF has three novels and two poems. But Classic Library unaccountably lacks Jane Eyre, Dracula, Beowulf and Paradise Lost, and it has no Chaucer, Defoe or Fielding. Classic Library generally offers better depth in the 247 authors it covers, but Library of the Future 3 has a much broader range. The Bible is the only sacred text on Classic Library. I couldn't find any scientific texts and translated foreign texts are thin on the ground — no Flaubert, Dostoyevsky, Tolstoy or Ibsen, all of which feature in LotF.

Classic Library doesn't feature the illustrations or videos that are included in LotF, but I don't believe this to be any great loss. Instead, it has something rather more useful: a biography for every author listed. The search engine is not as powerful as World Library's. You can search by genre and other categories or do a plain text search, but you can't combine the two to find all of the works of Shakespeare containing "blood" and "guts".

Classic Library is definitely better than Library of the Future 2, which is the same price. Although Library of the Future has a greater selection of philosophical and religious documents, Classic Library has more literature and a hugely superior interface. Both have more books than you could possibly read through, but each has embarrassing gaps. If you don't mind spending twice as much and can live with an unattractive interface, Library of the Future 3 is the disc to have. If you're lucky enough to have a Mac it's your only choice at the moment, although a Mac version of Classic Library is due in May.

Contact Andromeda Interactive

01235 529595

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# Kids' Stuff

**Paul Begg and daughter Siobán have been learning French, brushing up their Shakespeare, and kicking the sagebrush on the streets of Tombstone.**

I never learned French in school, but Siobán has already begun and, as the wife was inexplicably opposed to having a French au pair to help with Siobán's homework, I took a look at three French language teaching packages: Le Français Interactif, French Pronunciation Tutor, and EZ Language.

Language learning has never looked easier. You can hear how words are pronounced, record your own voice and play back your efforts, and practice over and over until you get it right. The interactivity makes learning easier than with either video or audio tapes, and knocks learning a language from a book into a cocked hat.

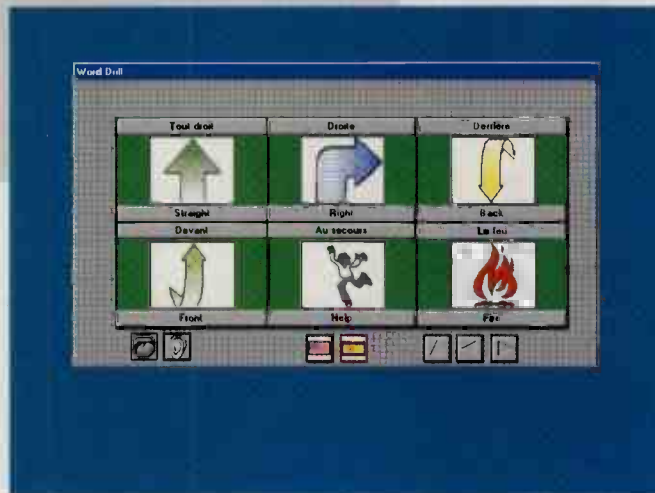
The extent of its coverage shows this product's quality

## Parlez-vous français?

Le Français Interactif is based on Part 1 of the bestselling French course *Avantage*, and corresponds to Key Stages 3 and 4 in the National Curriculum. It is aimed at children aged 11-14 who are beginners in French, but beginners of any age can use it.

It contains text, pictures, video and audio and there are 20 theme-based units. The manual describes them as "units", but they are basically groups of lessons that become progressively harder as you work through them. The lessons are games that vary in complexity and require different skills.

A lesson (or game) begins simply enough with pictures. When you click on a picture you hear its name in French. In the next "game", words are



spoken at random and you have to click on the appropriate picture. And so it goes.

You can repeat the lesson over and over until you are perfect, and if there are words you don't know, simply click on the button "Petit Dico, cherchez les mots inconnus", which brings up a dictionary window giving an alphabetical listing of all the words which appear on the screen you are currently viewing.

The computer allows immediate feedback, lets pupils learn at their own speed, in their own time and in their own way, and helps develop computer skills. And, of course, it helps mum and dad when it comes to ordering those vital bottles of booze in the supermarket at Calais.

I was, frankly, surprised by how quickly Siobán took to Le Français Interactif. She both enjoyed playing the games and gained satisfaction from her successes. Her accent, though, remained as French as roast beef and Yorkshire pudding.

Which is where French

EZ Language is simple but useful — and more than one language

Pronunciation Tutor from HyperGlot earns a very warm recommendation. This package is brilliant. Ideally you should have a microphone connected to your computer because the aim of this disc is to perfect pronunciation skills. It teaches the alphabet, difficult letter combinations and words. The Topics screen gives an idea of the coverage of French Pronunciation Tutor, which ranges from the correct pronunciation of each letter of the French alphabet, through vowel sounds and consonants to numbers and telling the time.

It's one step up from Le Français Interactif in that the intermediate learner is catered for, giving someone with a goodish knowledge of the language the opportunity to perfect and master the most difficult sound combinations. With play and record features on every screen, you have constant access to your progress.





It's Benny from Cross-roads! Funny who you meet in old Verona

I particularly liked a feature called Picture Express. This contains four screens introducing common French expressions. You can watch the wave pattern produced by the native French speaker and seek to match it yourself.

Finally, EZ Language from IMSI is fairly basic, but has the advantage of not restricting you to a single language: there are modules for French, German, Spanish, Italian, and Russian and Japanese! So, while Siobán practices her French, mum can have a go at Russian and I can brush up my pronunciation of Pizza Fungi.

Each language consists of 16 interactive lessons per language (except for Russian and Japanese which have eight; the diskette version consists of eight lessons for all languages) and the lessons are categorised: Basic Phrases, Arrival, Eating Out, Shopping, Sightseeing, Hotel, Public Services, and Sports. The lessons are simple: you look at pictures, hear a native speaker's pronunciation and have a go yourself. There are also several useful phrases and at the end of each section multiple choice tests let you measure your success.

### Going by the bard

Moving from foreign languages to our own, I was nearly put off Shakespeare for life by the sheer tedium of English Literature lessons in school. With this in mind, I'm pleased to see anything that can be used by teachers and parents to make Shakespeare more understandable and enjoyable for children.

The only superlative I can use for Romeo and Juliet from Attica is "brilliant". The third in the BBC Shakespeare series that already includes Macbeth and a Midsummer Night's Dream, it lacks nothing. You get the complete (Alexander) text of the play, a complete audio version, extracts from the BBC television production, video and audio interviews with actors, directors and critics; and loads of photographs of past and present performers and performances. On top of this, there's a biography and chronology of Shakespeare's life and times, a history of



the theatre, a complete glossary and textual notes.

I simply never ceased to be impressed and felt that at £49 (+ VAT) it represented good value for money. There is also a special schools version priced at £75 + VAT

### PCW Details

#### Le Français Interactif

Contact Attica Cybernetics

01865 791346

Price £149

Rating ★★★★★

#### French Pronunciation Tutor

Contact Guildsoft 01752 895100

Price £44.95

Rating ★★★★★

#### EZ Language

Contact IMSI 0181 758 1447

Price £69.95 for all six languages on CD-ROM; £39.95 for each individual language on floppy disk

Rating ★★★★★

#### William Shakespeare:

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01235 529595

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Rating ★★★★★

#### Romeo and Juliet

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Price £49; Schools price £75, includes workshops and teacher's notes

Rating ★★★★★

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that comes with teacher's notes and workshops.

From the main menu you can access seven categories: The Play, Plot, Performance, Characters, Language, Themes, and Background. The Play is probably the most important. Against a background appropriate to the various scenes, there is text on the lefthand side of the screen and pictures of the characters currently on stage on the righthand side. The text automatically changes as the audio runs.

Among the other features is Performance, which covers Actors and Acting, Sets and Scenery, Costume, Music, and Musical Adaptations. Another section, Language, lets you explore the language of Shakespeare from Verse and Prose through Imagery and Puns to Bawdry. A real bonus is The Life of Shakespeare, a distinct module available from the main program or via a separate icon in Program Manager. Everything from his Early Life to his last years, with a list of publications and a timeline.

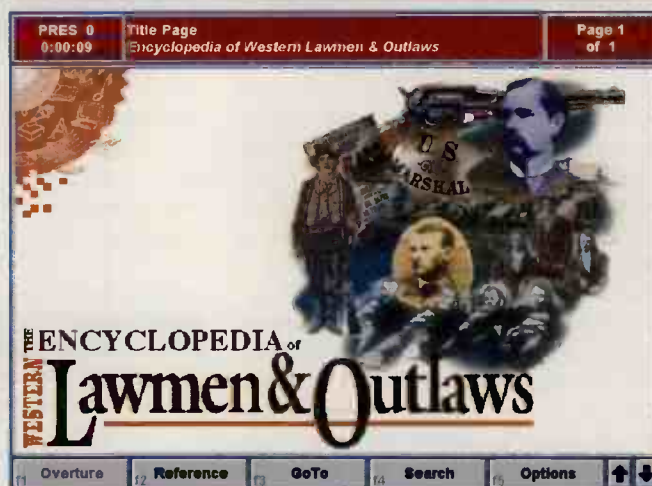
The other bardic disk to come my way is William Shakespeare: The Complete Works on CD-ROM. There's no shortage of Shakespeare's complete works available for the computer, but what distinguishes this disc is that it uses texts and notes from the Oxford

University Press, so the quality and reliability would seem assured. Also, 12 of the plays (As You Like It, Hamlet, Henry IV, Julius Caesar, King Lear — The Folio Text, Macbeth, The Merchant of Venice, A Midsummer Night's Dream, Othello, Romeo and Juliet, The Taming of the Shrew, and Twelfth Night) are Schools Shakespeare texts and come with an introduction, notes on main characters, a summary of the plot, and line-by-line notes explaining words and phrases.

Otherwise, as with all book collections, the remaining advantage of disc over book is the ability to search quickly and comprehensively. I think it was Orson Welles who once observed: "Now we sit through Shakespeare in order to recognise the quotations." Now you can find those quotations at a keystroke and perform free-text searches, phrase searches, title searches and word searches. The whole thing is rounded off with a complete list of plays arranged under date of performance and a background to Shakespeare's England. On the computer side, there's a bookmark, integral word processor (handy for those essays), full copy and paste facilities, and an animated user interface to add a little fun.

#### On the Western front

After language lessons and culture, a little light relief was needed. It was provided by



Wyatt Earp's Old West from Grolier and MDI's magnificent The Encyclopedia of Western Lawmen and Outlaws.

Howdy, pardner! Want to know what the Old West was really like? Wyatt Earp's Old West is basically an exploration of a western town — the saloon, sheriff's office, boot hill etc. You can walk down the dusty streets and investigate whatever takes your fancy, or choose a location from a map. When you enter buildings, you can look around a full 360° and walk from one end of a room to the other. To know more about something, just point at it and click the mouse. There's music and a full narration.

The Encyclopedia of Western Lawmen and Outlaws is about as exhaustive an encyclopedia as you will get. Written and with a lengthy narrated introduction by Jay Robert Nash, one of the foremost American true crime writers, there's a wealth of information on this disc and a really

#### Top Wyatt Earp's Old West:

kick the sagebrush and down a tumbler of red eye in Tombstone. **Above**

Encyclopedia of Lawmen:

Everybody's here — the interface is very bad, but the wealth of information and the photos makes this a great disc

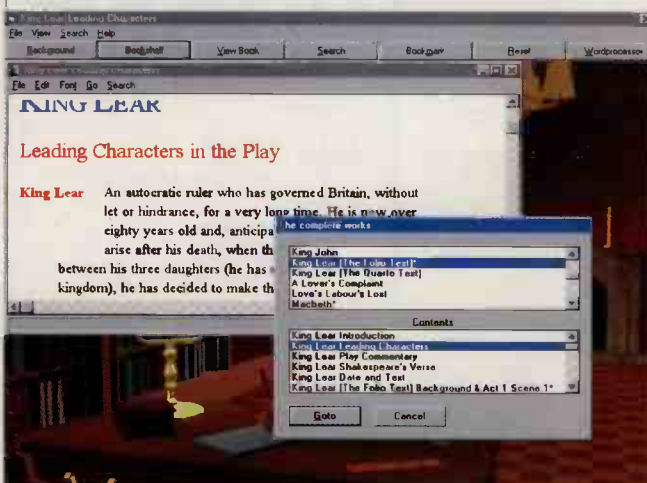
impressive number of pictures. It's let down by one of the least intuitive user interfaces I have ever come across, but I tolerate it for the sake of the quantity and quality of the information.

Both discs may look frivolous at first glance, but I think children can be introduced to a wider historical panorama if we can only show them that history is interesting. **PCW**

#### Special Needs

In a few months I want to take a look at software for children with special needs. If you have "hands on" experience in this area and know of packages you think others might benefit from a look at, let me know at pbegg@cix.compulink.co.uk or via PCW.

William Shakespeare on CD-ROM: English Lit homework was never so easy







# Made-to-measure 90MHz Pentium® processor-based PCs

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custom assembled quality PCs can be lower than the cost of an off the peg PC, fitted with additional hardware. So before you're tempted with an off the peg solution give us a call and find out more about our *made-to-measure* systems designed specifically to fit your needs.

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| 16-bit Sound Blaster Sound Card with Yamaha Speakers              |                  | yes                    | yes                     | yes                     | yes                     |
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| Professional Keyboard and Mouse                                   | yes              | yes                    | yes                     | yes                     | yes                     |
| MS DOS 6.2 Windows for Workgroups 3.1 (loaded)                    | yes              | yes                    | yes                     | yes                     | yes                     |
| Internal Yamaha CDR100 Quad Speed SCSI CD Recorder                |                  |                        |                         | yes                     | yes                     |
| Adaptec 1540 SCSI card ISA bus (for Yamaha CD Recorder)           |                  |                        |                         | yes                     | yes                     |
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| Corel CD Creator or WinOnCD ToGo - CD recording software (loaded) |                  |                        | WinOnCD ToGo            | yes                     |                         |
| VideoPack - VideoCD recording software (loaded) + full WinOnCD    |                  |                        | option £1,398           | option £1,398           | yes                     |
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**Clevo Company**  
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7600 P54C-90 Pentium  
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# Win one of 50 DTP and Design Packages

**G**ST has generously offered 25 copies each of Pressworks 2.0 and Designworks 2.0 to give away in this month's competition. The two applications have been awarded the *PCW* Editor's Choice in previous issues for their high-end features, flexibility and low cost.

## Designworks 2.0

Designworks 2.0 has all the key elements for producing company logos, posters and complex graphics with the use of layers. Easy to use tools let you create perfect arcs and polygons with the option to rotate, skew and scale any object.

The Keypad displays the available fonts on your system, including foreign accents and mathematical symbols for use in your documents. Designworks also comes with 84 TrueType fonts and 1,200 clipart images.

Other useful utilities include Snapshot for capturing screens, icons and Windows; a Photo CD and clip art browser. All this for an incredible £79 including VAT.

## Pressworks 2.0

This latest release of Pressworks is a major upgrade from version 1.0 with a whole new look and feel. The first thing

you will notice is the new user interface making the package even easier to use. Context-sensitive toolbars reveal features as they're needed and allow quicker access to the many features. As with Designworks, toolbars can be floating or in a fixed position. New to version 2.0 is a zoom facility and extended pasteboard.

The most welcome addition to the package is PagePilot technology which provides a step-by-step route to create documents and templates similar to Microsoft's Wizards. Not surprisingly, PagePilots save a lot of time when producing documents and reports, but they're also a useful source for new design and layout ideas.

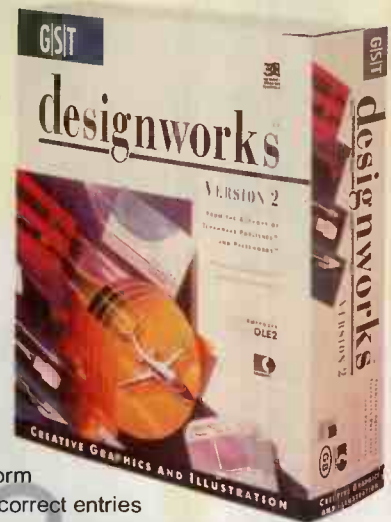
PowerText functionality has also been revamped and now allows headlines and logos to be warped, stretched, dropped and skewed. Pressworks 2.0 has support for TWAIN scanners and GIF, Targa and JPEG import filters. The package will handle booklet printing and features thumbnail printing too, whereby up to eight pages can be printed on one page.

Pressworks 2.0 can be yours for a giveaway price of £39. Alternatively, have a crack at this month's competition.

## How to enter

All you need to do is answer the three simple questions on the entry form below. The first 10 correct entries drawn from the *PCW* hat will win copies of both applications. Thirty runners up will be able to choose which application they would like.

Please send your entry to: GST Competition, *Personal Computer World* Editorial, VNU House, 32-34 Broadwick Street, London W1A 2HG. Entries should arrive by 30th June 1995.



## PCW/DTP Competition Entry Form

**1.** What does GST call the automated programs which create instant designs for you within Pressworks 2?

**2.** If you take the number of TrueType fonts away from the number of clip art images provided with Designworks, what number are you left with?

**3.** Both packages have support for OLE2. What is OLE an acronym for?

Name .....

Address .....

Daytime

Tel.....

Occupation .....

☐ Please tick if you do not wish to receive further related material.

## Rules of Entry

The competition is open to all readers of *Personal Computer World* except for employees, and their families, of VNU Business Publications and GST Software. Each application must be submitted on the official form on this page — no photocopies will be accepted. All entries to arrive no later than 30th June 1995. The Editor of *PCW* is the sole judge of the competition and his decision is final. No cash alternative is available in lieu of prizes.



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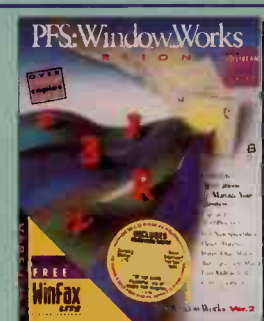


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# screenplay NEWS

CUTTING EDGE



## Deluxe Fantasies for pinball wizards

**21**st Century Entertainment, the people noted for pinball simulators, have added another four tables to their collection. Collectively called Pinball Fantasies Deluxe, it offers an eight-player option and a new "multiball" feature. New tables include Jackpot, Jail Break, Tarantula and Kick Off.

Four previous tables are included in the game, which is available now on PC CD-ROM for £39.99.

## Novastorm's hidden fruits

**D**id you know that Novastorm has a secret level? No? Neither did anyone at Psygnosis until recently. When the programming team handed over the finished game, they somehow forgot to mention that they had slipped in an extra level.

It happened at three in the morning when, as the team were feeling tired and emotional, they let their fetishes run wild. These fetishes turned out to include sewers, rabbits and tomatoes. Strange people.

Anyhow, to get into the secret level, type "tomatoes" at the beginning of level one. And lo and behold, you'll be pitting your wits against killer tomatoes for the rest of the game.



## Cybermaxx heads into Virtual Reality

**A**fter two years and four million dollars' worth of research and development, VictorMaxx has announced its new Virtual Reality headset for the PC. The unit integrates two active-matrix colour LCDs to provide stereoscopic vision at a resolution of 320 x 240.

The previous model, released in the States last year, was flawed due to its poor resolution and almost oval-shaped screen. The new CyberMaxx has a vastly improved optical system and is the first twin LCD headset to require no additional VGA card. Previous offerings from Virtual I/O and Forte have been let down by this. Neither offered the widescreen view that the CyberMaxx does, either.

The unit has full head tracking including realtime yaw, pitch and roll. I had a brief chance to test the product out with Doom.

Doom doesn't have support for pitch and roll like, for example, Descent, but that was all that was available at the time. The response to yaw movement (to turn about the vertical axis) was, however, surprisingly sensitive. The screen, despite being improved, still doesn't impress due to over-pixelisation.

The CyberMaxx was launched at this year's ECTS at Olympia and will be available from May for £509. The package will contain four games including System Shock and Flight Unlimited.





# screenplay

## Wings of Glory

**Tired of worrying whether the force is with you or not? In 1917, all a fighter pilot has to do is point his nose at the enemy and let him have it. Just make sure your PC matches your engines in horsepower.**

**W**orld War I was the time to be a combat ace. No need to think about missiles, flares, radar and HUDs like you have to with Falcon 3.0 and other modern flight games. No need to worry either about shield settings or whether the force is with you as in XWing and Tie Fighter: just point your nose at the enemy and give him a burst of hot lead up the ailerons.

Origin designed the extremely popular Wing

*Objects on the ground are as nicely rendered as the planes you're flying against*

Commander and the rather less popular Strike Commander among other games. Wings of Glory takes the Strike Commander graphics engine and strips out all the hi-tech weaponry. As a result, you no longer need to remember dozens of keys — you can just about get by using the joystick alone.

As you would expect from an Origin product, it pushes your PC to the limit. If you don't have 8Mb of memory, a double-speed CD-ROM drive and a 33MHz 486DX, you needn't bother reading on. That being said, the Dell



*Shooting your opponent is as easy as pointing your nose at him and letting him have it!*

60MHz Pentium with 8Mb of RAM I played it on had no apparent difficulty coping.

All of that horsepower isn't wasted. Although it only displays 256-colour VGA graphics, the pictures that result are as good as you could wish. You don't feel you are there, exactly, but you don't find yourself wondering what that blob on the horizon is either, and the visual detail on the ground is satisfying.

After playing Wing Commander 3 and marvelling at the quality of the movie clips (with real acting!), the film scenes between missions in Wings of Glory are a real disappointment. You can carry out "conversations" with characters but you can't affect the way the talk goes. You don't have video clips to watch, either; instead you're back to stiff animated faces, wooden dialogue and appalling cod-English accents.

Chances are, though, that you didn't buy the game for a bit of a chat; you bought it for the flying and the shooting.

Though there is a longish list of "realism" options, it isn't a proper flight simulator — there is a long list of niggling inaccuracies you could object to. It is designed, above all, to be fun to fly, and there it succeeds: because the flight model is simplified, you don't have to spend your time worrying about staying in the air.

If you tire of the "plot", such as it is, you can create your own missions. Choose one of five planes either bombing or in straight fighter-to-fighter combat, taking on a wide variety of enemy fighters and bombers.

Wings of Glory doesn't break any new ground in gaming technology, but if you've got a state-of-the-art system it looks good and is fun to play. What more could you ask for?

**David Brake**

System Requirements: 33MHz 486DX, 8Mb memory, double-speed CD-ROM drive  
Contact: Electronic Arts  
01753 549442  
Price: £34.03 PC CD-ROM





## Premier Manager 3

A football manager's lot is not always a happy one, and in some cases it can be a very tricky one. Armchair expert Kevin Dodwell gets his chance with his own first team and finds there's more to it than just scoring.

**P**remier Manager 3 scores by being the most comprehensive football management game on the market to date. It is essentially the same as its predecessors but far more in-depth. Before you hear the whistle blow, all sorts of dilemmas and decisions have to be made by you, the newly appointed manager, to get the team into a state of fitness and readiness. Some of these decisions will be an eye-opener to the less discerning armchair football critic like myself, such as employing a groundsman, arranging insurance, sponsorship, a physiotherapist...

How you will ever cope? Will the strain show in your first match tactics, or will you rise to the organisational challenge? At least you get your chance to prove to the failed managers of the football league that you can do the job just as

badly as them, and possibly a little worse.

The game is not as easy as it looks. You definitely need to read the manual before attempting to arrange any kind of loan for Manchester United strikers surplus to requirements. In fact, the game designers make great play of the fact that it is so comprehensive, but for me, so much detail takes some of the fun away from the overall gameplay.

It's all a little too real. If this is your first purchase in the Premier Manager series and you're expecting a "kick 'em about" football game, you'll be disappointed.

On the other hand, if you want to extend the business acumen you acquired in the earlier games, you will be hooked by the addictive nature of this one, in which you will find yourself drawn into a web of teasing decision making that is bound to keep you awake at nights wondering whether you sold the right player for the



*Canal Street's not the best place to kick the ball around. It doesn't even have a gym*



wrong money.

There's a nice feature whereby once you have hired the staff, sorted the finances, studied your players and selected your match-winning team (including subs for the inevitable red card), you can actually see your blood, sweat and tears come to fruition. The match is played in front of your eyes, penalties and all! From here you can assess individual players' abilities and decide whether or not to drop them for the next match.

As well as the league championship, the teams will be competing in the season's various cup challenges. Be aware that your job as manager is never safe, as the directors of the club may well throw in the towel on your performance at any time and ask you to take your questionable skills to another club.

**Top** Having selected players and tactics, you can sit back and enjoy the game

**Above** Afterwards, you can sum up each player's abilities

Premier Manager can hardly be called a "game" as such. It is for the serious football fan who wants to put his years of part-time Sunday league experience to the test, and put right everything he feels is wrong in football today. But avoid scandalous tax evasion deals, as these are bound to lead you down the slippery path to unemployment.

**Kevin Dodwell**

System Requirements: 386SX, 7Mb hard disk space, 550kb base memory. To use the excellent sound effects you will require a further 2Mb of EMS memory. Contact: Gremlin Interactive 01742 753423 Price: £34.99 PC CD-ROM and floppy.



## Klik &amp; Play Tutorial Part Two

**A**long with several other computer titles we are running a competition with Europress to find Britain's greatest games creator. The winner will receive an all expenses paid trip to Florida for two, plus spending money. There's also £250 for PCW's best author and £50 for runners-up. To help you create that masterpiece, here is the second tutorial packed with hints and tips. Don't forget, the closing date for the competition is 25th April 1995.

- 1 Take control of your objects. Assign your objects to a ball movement, and set the speed to zero. Change their X or Y coordinates using the "Set X Coordinate" or "Set Y Coordinate" actions from the Event Editor. This lets you do clever things like simulating gravity or walking a monster across a moving platform.
- 2 Use the Static option to create "intelligent backgrounds". Sometimes, an active object can do a great job just by sitting quietly in the background. You can use these objects as buttons for your

control panels, or slide a character behind them to give a 3D illusion.

**3** Convert your text into graphics and import it into an object. Enter your text into a Windows word processor and check formatting carefully. When you're satisfied, move to each page and press the PRINT-SCREEN key to grab it onto the Clipboard. You can then copy the results into Windows Paintbrush using the PASTE option, and save the graphics as a .BMP file. They can now be imported directly into a Klik & Play Object.

**4** Manipulate your animations with the Resize Zoom option. Click on a frame in the Animation Editor with the right mouse button and select the Resize Zoom option. This changes the dimensions of a single image over a series of "animation" frames. You can zoom your aliens into the distance, or stretch pictures into weird and wonderful shapes.

**5** Use counters to trigger events. Suppose you want to create a game like Space Invaders. The aliens should sweep across the screen, and move down in unison when they reach one of the edges. You can control this pattern using a counter. First, check the alien's position and set a counter to a trigger value such as 1. You can now test for this counter in your game. If it's equal to the trigger you can reverse the aliens' movement directions and increase their Y Coordinates by an appropriate amount. Set the counter back to zero to start again.

**6** Create guided missiles with the "look in direction" action. Once you've started the object moving, you can repeatedly change its direction so that it homes in on the selected target. It doesn't matter how hard the target tries to dodge — your missile will follow it relentlessly.

**7** Generate 3D graphics using a raytracer. There are lots of these utilities in the Public Domain and although they take a while to master, the results can be professional.

**8** Use the "Appear" and "Disappear" sequences from the Animation Editor. "Appearing" shows your object being born in the screen when the object is first created. "Disappearing" is called automatically whenever you destroy an object in your game. Incidentally, you can copy animations between objects using the Select All option from the Edit menu. Just grab your sequence from the Animation Editor with copy, bring up your destination object, and paste the images into position.

**9** If your event contains several conditions, choose their order carefully. Klik & Play tests conditions involving collisions, timers or object locations first. "Alien Leaves the playfield and Counter 1=0" will be faster than "Counter 1=0 followed by Alien Leaves the playfield".

**10** Use the Timer to regulate your actions. It starts at zero and increases by one every hundredth of a second. You can test it to perform your actions at regular intervals, or occasionally change an object's speed, position or direction. You can also fire up a new attack wave when the player is least expecting it!

## Charts

HMV Games  
LEVEL ONE

## PC

|    |                       |           |
|----|-----------------------|-----------|
| 1  | Star Trek Interactive | Ablac     |
| 2  | Alone in the Dark 3   | Interplay |
| 3  | Theme Park            | EA        |
| 4  | Little Big Adventure  | EA        |
| 5  | Descent (shareware)   | Interplay |
| 6  | Magic Carpet          | EA        |
| 7  | Wing Commander 3      | EA        |
| 8  | Doom 2                | Virgin    |
| 9  | Nascar                | Virgin    |
| 10 | Creature Shock        | Virgin    |

## MAC

|    |                                |             |
|----|--------------------------------|-------------|
| 1  | Myst (CD)                      | EA          |
| 2  | Rebel Assault (CD)             | LucasArts   |
| 3  | Star Trek Next Generation (CD) | Quicktime   |
| 4  | Sensory Overload               | RealityByte |
| 5  | Prince of Persia 2             | Broderbund  |
| 6  | Star Wars Screen Entertainment | Virgin      |
| 7  | Peter Gabriel Xplora (CD)      | Real World  |
| 8  | Gingerbread Man                | Broderbund  |
| 9  | Complete Lemmings              | Psygnosis   |
| 10 | Theme Park                     | EA          |

## Leisure Lines

## Brainteasers

courtesy of  
**JJ Clessa.**

## Quickie

A road 39 feet wide can be crossed by a bridge which has one-fifth of its length on one side of the road and 15 percent of its length on the other. How long is the bridge?

## This Month's Prize Puzzle

For the uninitiated, a pythagorean triangle is a

triangle whose sides a, b and c are each an integral number of units in length, and have the relationship:

$$a^2 + b^2 = c^2$$

This month's prize problem relates to pythagorean triangles of a special kind — where the two shorter sides differ in length by one unit. For example, sides of 3 and 4 in a 3-4-5 triangle.

We want you to find the triangle with the smallest

hypotenuse, whose two shortest sides differ in length by one, and whose three sides — between them — contain all the digits 0 to 9.

That should keep the micros whirring for a while.

Answers on a postcard or the back of a sealed envelope — no letters and no floppy disks, please. Then send it to:

*Personal Computer World*  
Prize Puzzle — May 1995, PO Box 99, Harrogate, N Yorks HG2 0XJ, to arrive no later than 20th May 1995.

## Winner of February 1995 Prize Puzzle

Just less than 100 entries for our problem about the sheik's favourite son. Almost all the entries had the correct answer of 447 — the house numbers ranged from 320 to 447.

The winning card, chosen at random, came from Mr Phil Haselgrove of Cwmbran, Gwent, who receives our congratulations and a nice prize to follow. Meanwhile, to all the others, keep trying — it could be your turn next.



## Windows Development

|                                      |       |
|--------------------------------------|-------|
| Doc-To-Help - help authoring         | £275  |
| Robo-HELP - help authoring           | £365  |
| InstallSHIELD - installation utility | £319  |
| WinMaker Pro 6.0 - Win & NT          | £395  |
| PC-Logo Windows                      | £60   |
| Tools.h++, Linpack.h++, Math.h++     | £call |
| Visual SmallTalk - <i>new</i>        | £945  |
| Zinc new 4.0 for Win & NT            | £call |
| Graphics Server SDK new version      | £225  |
| SmartHeap Win or DOS                 | £345  |
| TCP/IP Development tools             | £call |
| CodeBase or CodeBase++               | £239  |
| Greenleaf Commlib 5.0 Prof           | £345  |
| C-Tree Plus - with source            | £595  |

## VB Value

|   |       |
|---|-------|
| Disctinct TCP/IP Visual Ed                  | £225  |
| Spyworks by Desaware                        | £110  |
| Spread/VBx                                  | £165  |
| TrueGrid Pro                                | £110  |
| VB Assist                                   | £135  |
| Designer Widgets or Data Widgets            | £95   |
| VB Tools 4.0                                | £110  |
| QuickPak Professional for Windows           | £139  |
| PDQ Comm Windows                            | £95   |
| Grid/VBx, Tab/VBx, and Tab/Pro - <i>new</i> | £call |
| Win/Widgets VB                              | £139  |
| Xref VB, HighEdit, etc                      | £call |

## Windows 32

|                  |      |
|------------------|------|
| SmartHeap Win/32 | £525 |
| Win Widgets/32   | £275 |

## Mathematics & Science

- Mathematica - DOS, Win, Mac, Workstations, Education & Student pricing.
- Derive - new ver 3.0 - call for upgrades.
- Origin windows scientific plotting.
- Lindo & What's Best Linear Programming  
...many more for maths & stats.

## UNIX

- SCO UNIX operating & dev. systems.
- SCO Open Desktop, TCP/IP and NFS.
- FoxPro for SCO UNIX (NEW)
- PC TCP, NFS and Xwindow servers

## For FORTRAN

|                               |       |
|-------------------------------|-------|
| Lahey FORTRAN 90 - new        | £625  |
| MS FORTRAN-77 5.1 - DOS       | £145  |
| MS FORTRAN Powerstation - DOS | £229  |
| MS FORTRAN Powerstation - NT  | £399  |
| IMSL Numerics for MS Fortran  | £call |
| IMSL Exponent Graphics for NT | £595  |

## Cross Development

|                                |       |
|--------------------------------|-------|
| Hi-Tech C Cross - many targets | £call |
| Introl C Cross - many targets  | £call |
| 2500AD Cross Asm & Simulators  | £call |

## Phar Lap

|                                     |      |
|-------------------------------------|------|
| FrontRunner - run VC++ 2.0 from Win | £95  |
| TNTIDOS Extender SDK - 32 bit       | £329 |
| 286IDOS Extender SDK - 16 bit       | £329 |

# SOFTWARE DEVELOPMENT TOOLS FOR WINDOWS, DOS, UNIX, & OS/2

## Microsoft

|                                      |             |
|--------------------------------------|-------------|
| Visual C++ 2.0 CD, & VC++ 1.5 16-bit | £299        |
| Visual C++ 2.0 CD upgrades MS C/C++  | £149        |
| Visual C++ for MIPs or Alpha NT      | £595        |
| Visual C++ Cross for MAC target      | £call       |
| Visual Basic Windows PE              | £229        |
| TEST for Windows new 3.0             | £465        |
| Macro Assembler 6.11- NT or DOS      | £110        |
| Access/Access Dev Kit                | £289 / £295 |
| SQL Workstation System - NT          | £415        |
| Project for Windows                  | £375        |
| Office and Office Professional       | £call       |
| SourceSafe Version Control           | £call       |

(See FORTRAN Section)

## Editors and Tools

|                                    |       |
|------------------------------------|-------|
| CodeWright Prog Editor Win         | £159  |
| CodeWright Fusion for MS VC++      | £99   |
| Multi-EDIT Pro - DOS               | £129  |
| PC Lint C/C++ - Lint code checking | £149  |
| Flowcharting & diagramming tools   | £call |
| PC-Install DOS or Win              | £call |
| DemoShield - Build Windows Demos   | £call |
| Kedit for Windows - <i>new</i>     | £129  |

## MKS

|  |      |
|--|------|
| MKS Toolkit of Unix tools                | £210 |
| Source Integrity (ex RCS) <i>New ver</i> | £315 |
| MKS Lex & Yacc for C, C++ & TP           | £215 |
| Internet AnyWhere - off line news & Mail | £99  |

For Windows/Dos, OS/2 & NT, call for multi-user licences on all MKS products.

## Watcom

|   |       |
|---|-------|
| Watcom C/C++ 10.0 CD-ROM ( <i>special</i> )     | £155  |
| <i>Printed documentation is also available</i>  |       |
| Watcom Fortran-77 <sup>32</sup> - DOS, OS/2, NT | £375  |
| Watcom SQL - DOS, Win, OS/2                     | £229  |
| <i>SQL Servers for Win, Netware, NT or DOS</i>  |       |
| VX.REXX/VX.REXX Client Server-OS/2              | £call |

## Borland

|  |       |
|--|-------|
| Borland C++ 4.5 - Win, NT & 95                 | £289  |
| Borland C++4.5 & Dbase Frameworks              | £415  |
| <i>Upgrades &amp; Comp. Upgrades available</i> |       |
| Power Pack for DOS                             | £69   |
| Borland C++OS/2 new version 2.0                | £325  |
| Delphi - <i>special pricing</i>                | £199  |
| Visual Solutions Pack of Vbxs                  | £59   |
| Turbo Assembler                                | £59   |
| Borland Pascal & Turbo Pascal                  | £call |
| dBASE Win or dBASE Dist Kit                    | £call |

## Nu-Mega

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|----------------------------------|------|
| BOUNDS-CHECKER Win/32            | £195 |
| BOUNDS-CHECKER Win               | £195 |
| BOUNDS-CHECKER Win/NT            | £195 |
| Soft-ICE/W with 32-bit functions | £295 |

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## PVCS Specialists

- PVCS Version Manager is available for Win, Win NT, OS/2 and many Unix platforms in single user and work-group configurations for all development teams.

## OS/2

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|------------------------------------|-----------|
| OS/2 Warp for Windows - 3.5" or CD | £call     |
| OS/2 Warp Win-OS/2 - CD/3.5"       | £99/£115  |
| IBM C Set++ - CD/3.5"              | £345/£385 |
| Visual Age 2.0 for OS/2 or Windows | £call     |

## CLIENT/SERVER

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| Btrieve Development DOS or Windows        | £395      |
| Btrieve Client Engines DOS or Windows     | £645      |
| Scalable SQL for Netware                  | £call     |
| PowerBuilder Desktop 4 ( <i>special</i> ) | £call     |
| Crystal Reports Std or Pro - 4.0          | £139/£289 |

## CASE

|                               |       |
|-------------------------------|-------|
| EasyCASE Professional Win 4.2 | £695  |
| EasyCASE DataBase Eng for SQL | £call |
| InfoModeller Desktop          | £call |

## NEWS

- Heap Agent - new from MicroQuill, for debugging those pesky Windows memory problems.
- Borland Delphi - new Windows applications development tool with Client/Server capability - now shipping.
- Competitive upgrades to PowerBuilder 4 Desktop for Clipper & dBASE users - call for details.
- PVCS Version Manager - new release 5.2 now shipping - call for upgrade details.
- Btrieve for Windows NT expected - Btrieve developers can add NT to supported platforms.
- MKS release a new version of Source Integrity - (formerly RCS), now with event triggers.

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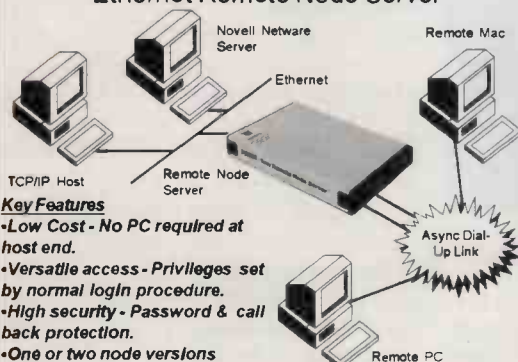


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# Hands On Contents

## OPERATING SYSTEMS



### Windows 588

Out with the old, says Tim Nott, as he sets about cleaning up and sorting out his hard disk. A great space-saving exercise.



### DOS 592

CTTY isn't used too often but it's pretty nifty. Simon Collin shows why and how.



### 32-Bit 594

When Chris Bidmead lost NeXTstep just before Christmas, P&L came in person to help out.

## APPLICATIONS



### Word Processing 598

New recruit Tim Phillips rummages around in WP packages to discover hidden gems.



### Spreadsheets 604

Stephen Wells turns his attention to Excel shortcuts and price sensitivity analysis.



### Databases 608

Mark Whitehorn on error trapping in relation to phone code and postcode input masks.



### Graphics & DTP 612

Gordon Laing has fun embellishing his fonts, and comes face to face with Madzine Whip.



### Multimedia 618

Karl Dunkerley gets to grips with Elastic Reality, which "Warps" one image onto another.



### Sound 622

Steven Helstrip found the Atari's MIDI facilities hit the right notes during a studio session.

## PROGRAMMING



### Visual Programming 626

It's not quite Compiled Visual Basic, but Progress reckons it's the next best thing. Tim Anderson enjoys some speculation.



### Low Level 630

Mike Liardet runs rampant through the "registry" in Windows 3.1, showing you how to manipulate the information within it.

**Hardly a month goes by without a change to Hands On. Regular readers will notice the change in the title of Tim Anderson's Visual Basic column. The Microsoft product used to be so dominant that it justified its own section, but recent developments make the Visual Programming tag more appropriate. We could have called it RAD (Rapid Application Development) but that's too much of a mouthful.**

**Also new (or newish) to Hands On is our Beginners section, now written by Eleanor Turton-Hill. PCW is the sort of computer magazine that a lot of absolute beginners find a mite tricky and Beginners sets out to put that right.**

**Hands On remains the place where readers can contribute to PCW, and as always we'll pay for anything we use. Macros, sections of code and hints and tips will be rewarded with a £20 book or record token (please say which you'd prefer) and we'll pay hard cash for longer, more involved pieces. Please include relevant screenshots in GIF format.**

**All submissions should be emailed to the author of the appropriate section or snailmailed to Hands On, Personal Computer World Editorial, VNU House, 32-34 Broadwick Street, London W1A 2HG. Questions and short hints and tips can be faxed on 0171 895 8098.**



### Numbers Count 638

Binomial Coefficients for Beginners and contributions from readers, with Mike Mudge.



## AND THE REST...

### Networks 640

It's three in the morning and Stephen Rodda's upset by an Atlantic card's settings.



### Macintosh 645

Chris Cain has the latest news on the new Word and gives tips on digitising video with AV Macs, plus there's shareware and leisure.



### Computer Answers 648

Doom takes exception to something on a drive controller — Frank Leonhardt zooms in.



### Beginners 650

Eleanor Turton-Hill gets down to the nitty-gritty of Windows For Workgroups configurations.



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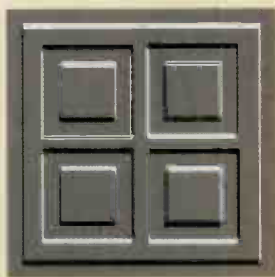
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## Chuckling out time

**It's that time of year again, when Tim Nott's thoughts turn to matters of spring cleaning. He shows you how to clean your hard disk, clear out unwanted files and save more space than you ever thought possible.**

**H**aving considered data and disk compression topics during the past few issues, the next subject to examine is how to optimise available disk space without resorting to disk-doubling devilry. Yes, it's time to spring-clean your hard disk.

The first thing to do is either close Windows or reboot your PC and stay in DOS. If you're using MSDOS 5.0 or earlier type "chkdsk /f". MSDOS 6.0 users have the rather more versatile "scandisk". Both these utilities should have been installed in the DOS directory of your boot drive. If you're using a non-Microsoft version of DOS you'll have a similar command so read the friendly manual.

Both commands report on a variety of hard disk problems but the one we're looking for is "Lost Clusters". A lost cluster is an area on your hard disk which, although marked as occupied, actually contains data you cannot access; usually the debris resulting from a crash or from switching off with programs still running. If chkdsk or scandisk find any lost clusters, you'll be asked if you want to save them as accessible files — if you've recently lost data as the result of a crash, you might be able to recover it from the CHK files so created — otherwise answer "no" and you'll regain the disk space. You need to repeat this for each logical partition on your system, either by typing the command while logged on to that drive, or by typing "chkdsk c: /f", replacing the "c:" with each drive letter in turn. If you leave out the /f switch, chkdsk will report but not fix any problems. Scandisk has lots of switch options, which dedicated techies will

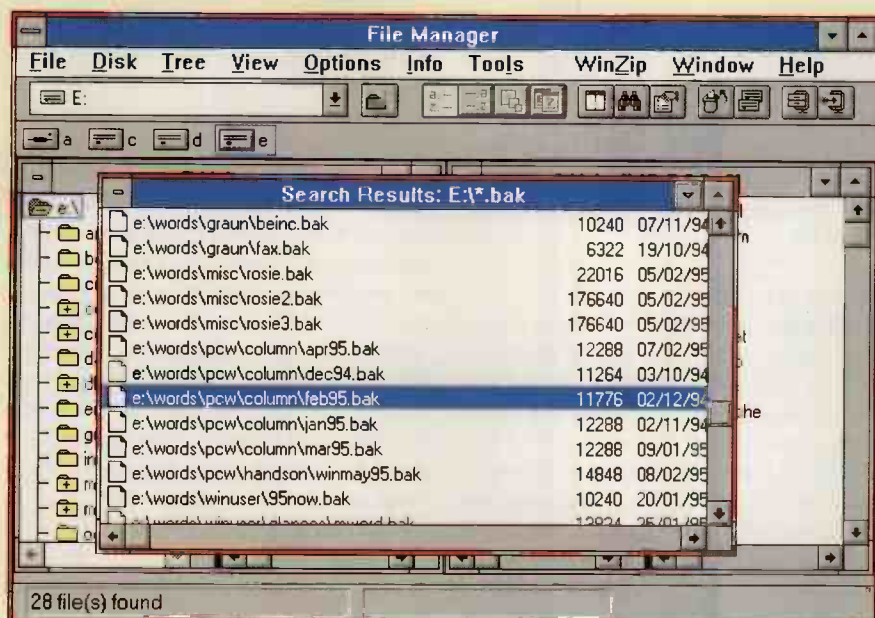
already know and aspiring ones can discover by typing "help scandisk" at the DOS prompt. Since it's interactive, no-one else really need bother with these, but you do need to run it for every partition.

Having regained your lost clusters, the next thing is to check what has been dumped in your TEMP directory. This is best done from outside Windows, or with just Program and File Manager open, as many applications create temporary files and would be rather put out if you were to delete active ones. With this caveat, the TEMP directory should be empty. However, it too can fill up with detritus from crashes, badly-written installation routines and stuff you yourself might have stashed in there and forgotten about. Delete the lot. Following my own advice, I've just reclaimed 4.6Mb of lost clusters, as well as 1.2Mb of junk from the TEMP directory.

### Weeding

The next thing to look at is all those backup files that applications create when you save a changed version of a file. Although useful if you crash, or if you do something irreversible that you wish you hadn't, once the work is finished and backed up on floppy or tape, backup files don't do a lot to justify their existence. Since the generally accepted extension for these is .BAK, you don't need to trawl through your hard disk one directory at a time. Point File Manager at the root directory and do a "File/Search" for \*.BAK making sure the Search Subdirectories box is checked. A new File Manager window will appear with all the BAK files listed. You





can then examine these to see if there are any you want to keep and delete the rest — remember that Ctrl+/ will select all the files in the window, and Ctrl+click on a single file will then deselect it; I've just regained 1.6Mb doing this.

If you've installed new software, you'll probably also find backups of your configuration files. It's always good practice to keep one previous generation of AUTOEXEC.BAT, CONFIG.SYS, WIN and SYSTEM.INI files back, just in case some stupid installation routine has stomped all over your carefully crafted set-up. If you use Sysedit to alter these, then previous versions will be automatically saved with the SYD extension. You might also find minimal versions of WIN and SYSTEM.INI with the extension CLN; Windows 3.11 creates these on installation and they'll provide a standard Windows set up which can be a useful rescue tool when things go very wrong — the rest can go.

Trawl through your Windows directory using Notepad to examine anything suspect such as WIN.COR (left by Corel Draw), WIN.SAM (courtesy of AmiPro) or WIN.001 to .004 (no idea, but 8/10/94 was obviously a busy day here). It seems obvious but someone out there may be daft enough, so — don't delete "WIN.COM" as this is the file that launches Windows. It's worth checking for old versions of other .INI files, and the Registration Database (REG.DAT) as well. My score here was seven old WIN.INIs, two SYSTEM.INIs, one old REG and three other INIs in the Windows directory, with two old CONFIGs and eight ancient AUTOEXECs gathering dust in the root directory; just

#### Weeding out the backups with File Manager

over 200kb in all.

So what other data can you get rid of? Anything you're not likely to need very often can be transferred to floppy disk. Other infrequently used stuff you might consider zipping up into one compressed file. If you use fax software then this can be a great pruning ground. Winfax, for instance, keeps a copy of each incoming and each outgoing fax. You may want to delete the former or if it's text, use the built-in OCR to convert from a large bitmap file to a small text file. If you prepare your outgoing faxes using a word processor then you should have the original text document on disk and so you can delete the fax files.

#### Strip the wallpaper

There are far more economical ways to keep bitmapped pictures on disk than as BMPs. If all you need is 256 colours, GIFs give good compression and are especially good for images with areas of identical colour, such as screenshots or cartoons. For high-colour photographic images, consider "glossy" formats such as JPEG or GIF — the degradation in image quality may be undetectable, and the amount of space saved can be vast.

Although the RLE format doesn't achieve the best compression, it does have the advantage that it can be used as wallpaper. Control Panel/Desktop/Wallpaper only sees files with the BMP extension so you need to type in the full filename and

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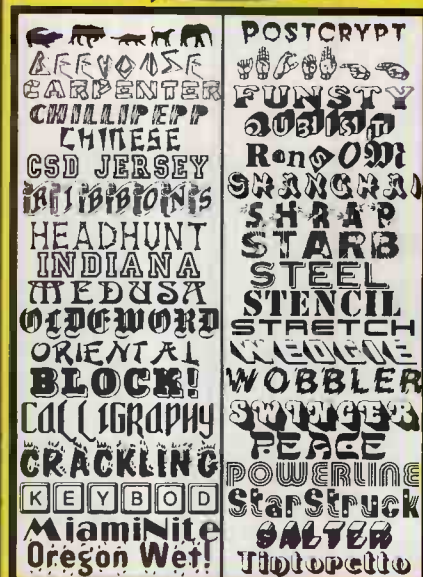
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extension. Better still, save the file as an RLE encoded BMP or rename it from MYPAPER.RLE to MYPAPER.BMP which will achieve the same end, as the formats are identical. Another obvious space-saver is to use small, tiled bitmaps as wallpaper instead of one, screen-sized file.

### Bits'n'pieces

Having got rid of the rubbish and redundant data, it's now the turn of Windows' bits and pieces themselves. Some files are so good that many installation routines insist you have several of them; BWCC.DLL used to be a firm favourite for multiple posting, but CTL3D.DLL seems to have overtaken it — both of these are used for tarting-up dialogue boxes. Other duplicates to look for are VBRUN###.DLL (where ### is a number) and files with the VBX extension; all these are used to run applications written in Visual Basic. Even though you can use the same File Manager/Search technique to list, say, all DLL files on a drive there is no easy way to discover duplicates — you don't get any order options in a search window.

Dupe14d is a shareware duplicate finder from Babbacombe Computers. You can set various options for searching either named directories or the whole disk and it will show all files of the same name, grouped together. You can then get it to compare files, delete true duplicates and so on. It saved 2.6Mb on my system with some real eye-openers such as applications "owning" two copies of the same file in different subdirectories. Dupe is rightly cautious about deleting files and you get plenty of chances to change your mind.

The general rule for DLLs is that a copy in the Windows\System or Windows

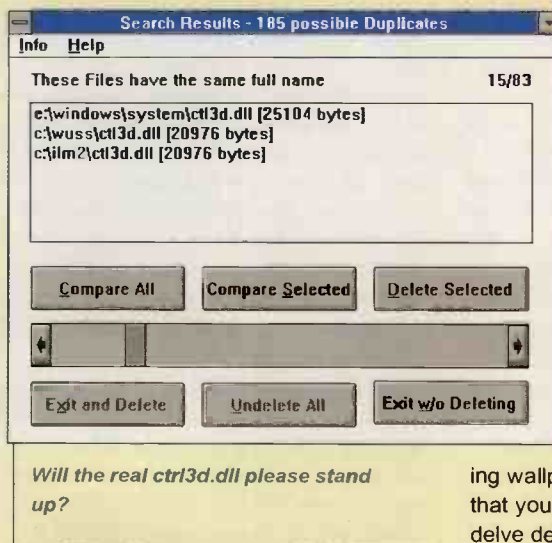
directory should be found by all applications. The waters are often muddled, however, by the existence of different versions of the same DLL, so you need to keep the most up-to-date version. Unless the duplicates are identical don't delete them right away — move them to a temporary directory (or floppy disk) and wait to see if anything falls over screaming for them. After a decent interval of mourning you can delete them. Some files with the same name are going to be completely different; README.TXT is an obvious example, as is the CHKLIST.MS file that Microsoft AntiVirus puts in each subdirectory, so you need to exercise some judgement about what is and what isn't redundant.

### Tidy up

Having got this far I'm 10.2Mb better off; how was it for you? It's now time to decide whether there are any bits of Windows you can do without. The easiest way to do this is from the Windows Setup program which allows you to install or remove various components but if you know what you're looking for, you can do the same from File Manager. It's quite surprising what you don't need; have you ever read those 300kb worth of readme files? Are you ever likely to? Do you still need the Windows Tutorial (178kb) or do you reckon you've got the hang of it now? Do you have a sound card or speaker driver? If not, then the 145kb or so taken up by the sound recorder, its help file and sound samples can be dispensed with. Do you have a modem? If not then there's not much point in hanging on to Terminal. But if you do have one you've probably got something better than Terminal, so you can chuck it anyway.

Similarly with Paintbrush; why keep it if you have a better bitmap editor? Do you need the games? The help files for the accessories total nearly 800kb, so if you reckon you know Notepad, Write *et al* well enough, why not ditch them? By the way don't delete WINHELP.EXE which is needed so that other help files can work. If you have Windows 3.11 on a standalone machine, are there any Workgroup bits that have been unnecessarily installed? There's potentially several megabytes to be saved here — more if you've been collect-

ing wallpaper, screensavers and suchlike that you no longer use. Next month, we'll delve deeper into Windows' innards in the





course of disk-saving surgery.

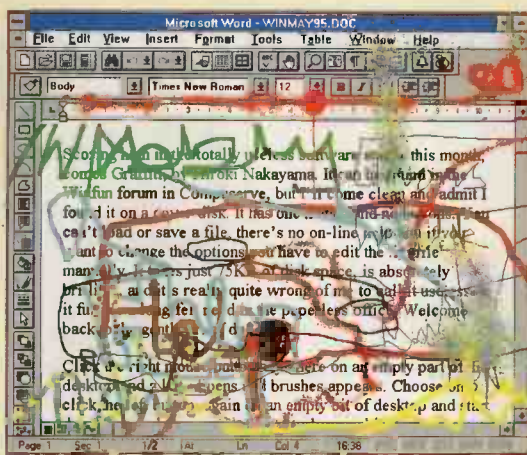
Last month, while writing about pasting in to Paintbrush, I mentioned the bug whereby you have to zoom out to avoid truncating the contents of the clipboard. My colleague Stephen Rodda has a rather better solution to this; paste the clipboard in normal view, then without clicking anywhere else choose Copy To from the Edit menu. This saves the entire image to a file rather than cropping it to the size of the window, as does File/Save As. The counterpart of this command, Paste From, is also useful. This allows you to paste a new image from file, over what's already on the screen instead of clearing the latter first as does File/Open. When followed up with a Copy it also gets round the rather awkward business of trying to select an entire image with the scissors tool, when it's very easy to miss a few pixels at the edges.

### Scibble wibble

Scoring highly in the totally useless software stakes this month is Graffiti, by Hiroki Nakayama. It can be found in the Winfun forum on Compuserve but I'll come clean and admit I found it on a cover disk. It has one menu and no buttons. You can't load or save a file, there's no online help and if you want to change the options you have to edit the INI file manually. It takes just 75kb of disk space and is absolutely brilliant, and it's really quite wrong of me to call it useless as it fulfils a long-felt need in the paperless office — welcome back to the gentle art of doodling.

Click the righthand mouse button anywhere on an empty part of the desktop and a list of pens and brushes appears. Choose one and click the lefthand button to start doodling. As long as you begin a stroke in a blank area you can continue it and scribble all over your favourite, or least favourite, application. There is an initial choice of six pens and brushes which can do wonderful things such as spray, drip down the screen or change colour just like a painting program. When you want to clean up there's an Erase command but if you want more brushes, then that's where the .INI file comes in. Surprisingly, it is very easy to create new brushes with different colours, thicknesses and behaviour.

Impressed by this netsuke-like craftsmanship, I emailed the author to find out if he had produced anything else. Back



Welcome back to the gentle art of doodling

came a reply from =?ISO-2022-JP?B?GyRCQ2Y7MyEhTTU0cBsoQg==?. Honestly, that's what it says in the message header:

"Hi Tim. Thank you letter. I am very happy to hear that Graffiti is working in UK! There is an other my product on CompuServe — WinFun. It is called SPKQQ.LZH. It can put clearly Wave-Sounds without Sound Board. It works good above Microsoft-SPEAKER.EXE. Try it when you have time. Please tell your-costomers about mine!!!" So I am, and before you laugh at his English, at least he can spell "graffiti", which my spelling checker tells me I can't, having used one "f" and two "t"s throughout. I did note, however, that his colleague Hitoshi Ozawa, who translated the program, endearingly refers to both "brushes" and "blushes" in the readme file.

Commenting in the March issue of PCW on the strange non-death of Standard mode, I mentioned in passing that the Microsoft Info utility reports a Windows 3.11 installation as 3.10. Thank you Bob Moore for pointing out that this is not a bug. It was done deliberately as "Microsoft found that lots of silly developers had written code that relied on the GetVersion API returning a value of 10 for the minor version number, so the system had to be hobbled in order to appease the great god compatibility." Sensible programmers write code that looks at the version resource stored in USER.EXE. Mere mortals can do this from the enhanced "File/Properties" in 3.11 File Manager, to which we'll return next month in part two of this spring-cleaning session.

### PCW Contacts

Tim Nott can be contacted either by post c/o PCW or by email on [timn.@cix.compulink.co.uk](mailto:timn.@cix.compulink.co.uk)

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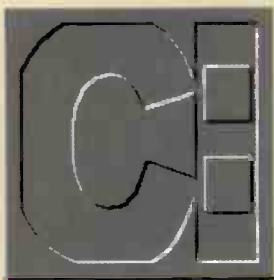
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# Help!

**Simon Collin explains how to provide Help files without resorting to the laborious DOS ECHO command, but starts with a look at the seldom used but rather nifty CTTY.**

Over the past year, I've covered some of the most common DOS commands in detail — everything you ever wanted to know about DIR, for example. This month, I thought I would take a look at a command you have probably never used: CTTY. This is used to tell the command processor which input device to look to for commands. If you've used programs like LapLink, you might have come across CTTY — the remote installation of LapLink uses the CTTY COM command to replace the keyboard with the serial port as the means of entering DOS commands.

This might not sound very useful, but it is particularly well suited to providing extra security for password protection or to stop intruders. For example, if you have a set of commands in your AUTOEXEC.BAT file that register the time and date of when the PC was last switched on, or perhaps ask for a password using an ANSI-based hidden password entry routine, then you could use CTTY to boost your security.

To prevent anyone issuing a Ctrl+C in the middle of your password batch file, or even being aware of a logging routine, you can effectively disable your keyboard using CTTY. For example, if you add the line CTTY NUL at the beginning of your AUTOEXEC.BAT file, or any password protection or logging file, then you're telling DOS to redirect any output to the NUL device and to look to the NUL device for user input. Since there's no NUL device, you've effectively blanked the screen and disabled the keyboard. You can now execute any batch-file command without the user's either seeing what's going on, or being able to stop it.

Once your batch file has finished its secure actions, you can return to normal screen/keyboard input/output by including the command CTTY CON at the end of your batch file. If anyone tries to Ctrl+C or Ctrl+Break in the middle of the batch file, they'll halt the program, but then they're stuck with no means of entering or displaying information: the only way out is to reboot. Once again, your data and logging routines are safe.

## Help, without the ECHO

I want to provide simple help files for my students who use DOS 6.0-based systems. Is there any way of doing this without having to write out hundreds of ECHO statements? Ideally, I would like to tie this in with the macro commands tips you published a few issues ago, so that it's possible to display the help text by pressing just one function key.

*It's a common requirement to want to display text files and, as you've pointed out, it's also very tedious to have to do this with the normal DOS ECHO command. You could solve your problem in a number of ways. Perhaps the simplest would be to use the standard DOS TYPE command, but that's hardly worthy of a mention in the column!*

*Instead, why not convert your text files into self-displaying programs? You can do this easily enough by adding a short assembly-language header to any text file, whereupon the header will display the following file one character at a time, until it detects the end of file marker:*

```
N TEXT.COM
E 0100 BE 14 01 AC 8A D0 F6 D0
E 0108 34 E5 74 06 B4 02 CD 21
E 0110 EB F1 CD 20
```

```
RCX
14
W
Q
```

*The simplest way of turning this into a COM file is to redirect the script above (with the blank line before RCX) into DEBUG, using the DEBUG < TEXT.SCR command. You've now created TEXT.COM and you can attach this as a header at the top of any text file. To do this, use the normal COPY command, but add the /B switch, which ensures that a binary copy is carried out. For example, if you want to create a self-displaying help file about disks, you might start with DISKS.TXT and TEXT.COM; to get to DISKS.COM use the following command:*

```
COPY TEXT.COM /B + DISKS.TXT /A
DISKS.COM
```

*Alternatively, you could enter text directly from the keyboard (the CON device, in DOS-speak) and then press Ctrl+Z when you've finished. To do this — and this is only really suitable for short text files — use the following line:*

```
COPY TEXT.COM /B + CON /A DISKS.COM
```

*Now to activate the DISKS.COM program from a function key. Again, there are several ways of doing this. In last month's issue, I used ANSI commands to attach a batch file to a Function key, but you can also detect which function key has been pressed and build this into a little help-front-end for your users.*

*For example, if your users want help, they could type "help", which would start a batch file to display the possible help topics: here's the basic batch-file structure:*

```
ECHO Press F1 for help on Disks
ECHO Press F2 for help on Printers
ECHO Press F3 for help on Keyboards
FUNC.COM
IF ERRORLEVEL = 3 GOTO DISKS
IF ERRORLEVEL = 2 GOTO PRINT
IF ERRORLEVEL = 1 GOTO KEY
:DISKS
DISKS.COM
```

*This HELP.COM file would be created using the TEXT.COM header described above. Now, to detect which function key to use, try the following short program. It uses function 8 of Int 21h — note that since the function keys return an extended ASCII code, the function has to be called twice, once to detect if it's an extended ASCII code, and again to check its value.*



```

Start  MOV AH,08 ; function 8 of Int 21
      INT 21
      CMP AL,00 ;check if it's an an extended ASCII code
      JNZ Start ; it's not, so go to start and wait
      MOV AH,08 ; it is, so call function 8 again
      INT 21
      SUB AL,3A ; mask for function keys
      MOV AH,4C ; set errorlevel to function key
      INT 21 ; and exit

```

This is the **DEBUG** script for **FUNC.COM**:

```

N FUNC.COM
E 0100 B4 08 CD 21 3C 00 75 F8
E 0108 B4 08 CD 21 2C 34 B4 4C
E 0110 CD 21
RCX
12
W
Q

```

You can call this little program, **FUNC.COM**, from any batch file and it will wait till a function key is pressed, then return its value as an errorlevel.

I've shown **FUNC.COM** in use in the batch file, above, but it's not terribly sophisticated to mix batch files and **COM** files like this. As I mentioned at the start, you could use **ANSI** codes to attach a command to a function key, a neater solution which avoids batch files cluttering up your hard disk. The downside is that you've got to load **ANSI.SYS**, which sits as a **TSR** and takes up memory.

To start this solution, first load **ANSI.SYS** from your **CONFIG.SYS** with the line:

```
DEVICE=ANSI.SYS
```

In order to redefine the action of a function key, you need to use the **ANSI**

construct [.p which tells the **ANSI** driver to redefine a key. Follow this with the code for the key, in this case 0;59 for **F1**, then the command you want to execute,

followed by character 13 (Return). The complete **ANSI** string to redefine **F1** so that it executes **DISKS.COM** when pressed is:

```
[0;59;"DISKS";13p
```

To implement an **ANSI** command completely, you can use the **DOS PROMPT** command:

```
PROMPT $e[0;59;"DISKS";13p
```

Enter this line manually or from the **AUTOEXEC.BAT** file and **F1** will generate **DISKS** then a Return character (13) to display your **DISKS.COM** text file.

### File FINDing

I work for a number of different clients, so I keep their work in separate directories, each with a new subdirectory for each month and subdirectories for letters, invoices etc. I thought I was very organised, until I wanted to try and find a file that wasn't where I thought it was. Since I couldn't remember what it was called, I ended up having to do a **DIR /S** command through all the subdirectories and checking each file. Surely there's a quicker way?

Luckily, **DOS** supplies a **FIND** utility, which more people would use, if they

knew about it. It's a simple command-line function that will look for text in a particular file or range of files. In your case, however, you would probably have found it most useful with piping. This lets you pipe the output of one command into another **DOS** command. For example, you can send the output of a **DIR** command into the **FIND** command so that it can search through the text for a name or a date.

For example, the standard **FIND** syntax is:

```
FIND "search_text" *.TXT
```

This would search through all **TXT** files in the current directory and display any line that contains the word "search\_text". **FIND** will accept a range of switches to display lines without the search text, search in case-sensitive mode or search subdirectories. However, since you only want to find a particular filename, you can set **FIND** to display only filenames with the **IF** switch.

To provide the text to be searched, issue a **DIR /S** command from the root directory and search for a part of the file name that you can remember, or, if you know the date, search for that (since the entire directory entry is passed from the **DIR** command to **FIND**). Lastly, if the file is a text file rather than a spreadsheet or database, you could search for content.

Your command would be:

```
DIR /S | FIND /F "search_text"
```

### PCW Contacts

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## A step up

**When NeXTstep refused to boot, Chris Bidmead found a level of support from P&L Systems that you don't see much of these days.**

It was too painful to relate at the time, so I've let several months slip by to make sure I get this in perspective. It wasn't the Canon object.station's fault, and it's not fair to blame NeXT UK, although I can't with my hand on my heart say that their support is exactly unsurpassed (I'm still waiting for the upgrade to the 3.3 version of the NeXTstep operating system that they said they'd send many months ago). Ultimately it was my fault, because I didn't back up, and I do go on so about how you've all got to back up, don't I?

What happened was that two days before Christmas I lost NeXTstep. A corrupted root filing system and the thing refused to boot. (This has a happy ending. Bear with me.) Oh, and I do have an excuse. What's the one occasion when it's perfectly legitimate not to back up? When you haven't a hope of restoring anyway, because you don't have a bootable version of the operating system on removable media. Canon doesn't supply a copy of the NeXTstep CD-ROM with the object.station, although it does install the operating system on the hard disk. Supposedly customers for the hardware will already have purchased a copy of the operating system, and the disk image on the machine is simply supplied as a courtesy.

Anyway, you get the point. Even if I had backed up the whole system, a disk crash that damaged the operating system wouldn't have allowed me to get back onto the tape to do the restore. I had the

blessing of NeXT UK to proceed without a legit CD because they fully intended to send me one when version 3.3 of NeXTstep arrived. To be on the safe side I put the minimum of new applications onto the machine and made sure my data was off on the NetWare server. But as the divine Joni Mitchell says: "You don't know what you've got till it's gone." The collapse came just as I was on the point of collecting some NeXT screenshots for this column. By the way, NeXTstep didn't just blow up in my face. I was trying to fix a minor problem with the NetWare services (that's another story) and had made the mistake of installing what was described as an official NetWare patch. When I did this the IPX connection to my servers died completely, and in trying to undo the patch I managed to hang the system. Unixes are not keen on your hitting the big red switch. These days most of them are pretty good at rebuilding the file system automatically, but this time I wasn't so lucky. Well, the obvious thing was to reinstall from scratch, so I picked up the phone to NeXT UK. The 3.3s weren't in yet, and as luck would have

it they'd completely run down their stock of 3.2 NeXTstep disks, and told me they didn't have disks for any of their own machines either — something to do with working off a server with the operating system supplied from the States on tape.

My fallback position was a small company called P&L Systems, in Amersham, Bucks. It's run by a man and wife team, Paul and Liz Lynch (hence the P&L). The company specialises in NeXT, selling application and development software and NeXT training and consultancy. In a niche market like NeXT you're either very, very busy, or you're out on the street. NeXT's shift from hardware to software seems to have stimulated a great deal of business for the companies that have stuck with it, and Paul and Liz tell me that in the last six months of '94 they turned over more than in the whole of the previous year.

They had no reason to come and help me out of my jam, but Liz drove down from Amersham the day before Christmas and personally delivered a CD of the operating system that got me up and running again in time to do the screenshots. It struck me then that although you hear a lot about the advantages of committing to an operating system with a huge user base like Windows, a niche market has its own special appeal too. Suppliers aren't forced into cutthroat margins, and customers get personal attention from professionals with expertise, rather than being left hanging on the end of a so-called "support line" listening to Gilbert O'Sullivan for hours on end until an engineer becomes free.

You can be too small (Coherent, the long-standing low cost Unix lookalike, has just closed its doors, I hear) or just not big enough (IBM is still having to spend a fortune promoting OS/2, and still hasn't attracted nearly enough applications).

With something in excess of 100,000 users worldwide, NeXT may be just the right size to be good business for everybody, customers and suppliers alike.

Anyway, thanks very much to Liz and Paul. Anybody else out there with NeXT problems can contact them on +44 (0)1494 432422, voice, or +44 (0)1494 432478 (fax). Their address is: P & L Systems, The Griffin, The Broadway, Old Amersham, Bucks HP7 0HP. Or email Paul\_Lynch@plsys.com.

*WetPaint from Lighthouse Design is a professional paint program that makes the most of NeXTstep's delightful GUI. One of the apps supplied by P&L Systems*





## Death of the PC

It's not often that I get completely knocked sideways by something I read in the press, particularly in the computer press, where I'm more or less supposed to know what's going on already. But it's just happened. If you're seeking this month's homily on awk, you seek in vain. I kicked it out to make room for what follows.

Last month I mentioned Phil Sutcliffe, who sent me the 386BSD CD-ROM. One of the newsletters he sends out is called PC Letter. Its editor is David Coursey, a nice enough chap in his way, but not, in my honest opinion, a patch on Stewart Alsop, the loud, confident, often wrong and always engaging founder of PC Letter, who much to the regret of us all ducked out of the editorship last year and went back to an earlier job editing InfoWorld.

Stew has popped up in the latest issue of PC Letter with a "Happy Birthday" piece to celebrate its 10th anniversary. Here's a bit of what he writes to give you a flavour of his bullying style (the guy is about ten feet tall and built like a bear). He's in mid-flow, telling us that the PC business is all over, finished and done with.

"Let's face it — the thing that got many of us charged up in the ten years from 1978 to 1987 doesn't exist any more. That thing was a sense of limitless possibilities, of the opportunity to change the world and life itself... I can't tell you how many people I know that made somewhere between \$2 million and \$400 million from the companies they started, and who are still wondering what to do next because they don't know how they did it the last time. That's the PC business in my mind. And it's gone."

Now maybe life is really going on pretty much as it was, and it's just that Stew is getting old. But that can't be, because I FEEL THE SAME WAY TOO. And I can't be getting old :-)

I'm not trying to boast that I know all those people who made all that money (Stew really does), or imply that somehow I wasn't just tagging along writing about it but was an entrepreneur in there along with the best of them (Stew really was). But I certainly have that same sense that something that was going on then, and was very exciting, isn't going on now.

This isn't like two old hippies bemoaning the loss of the sixties. Because, as Stew says, "We won... The very things we dreamed about in our younger days have come true." Definitely, Stew. Really portable portables, email that zings our messages between continents in the time it takes to have a cup of coffee. Globe-

trotting via the Web. And decent, usable and cheap 32-bit operating systems right there on our desktop, instead of stuck away on some unimaginably costly machine at the end of a terminal cable.

But then again... What happened to that practically limitless space for creating products that nobody had ever thought of before in the history of the world? What happened to that engineer, designer, managing director and van driver who, all rolled into a single human being, would turn up in my office at 9.00 am and start to demonstrate some remarkable new kit his tiny company was about to launch. (Ah, just remembered — at least two of those guys did go on to become millionaires. Must give them a call...) And where in heaven's name did all these PR people come from?

Stew complains — no, that's not Stew — Stew proclaims that today, just a few companies are pretty well controlling the present and future of the industry. "The PC companies are no longer upstarts shooting at behemoths; instead they are the behemoths." (I wish I'd written this stuff: just to be retyping it gives me prickles at the back of my neck...)

Yes, he's right of course. Windows NT exemplifies both aspects of his case. We win because it's a very well designed and built operating system that runs on affordable hardware at an affordable price. And we lose because — well, it's so dull. Yes, it has exotic ambitions, but they're unthreatening because it's moving towards them at a snail's pace. Listen, I'm not meaning to knock it. When you're running mission-critical software on an operating system, the last thing you want that operating system to be is exciting.

But then again, Stew's wrong, too. In their different ways Linux and OS/2 manage to deny his proposition. No properly "mature" industry would have allowed that strange ugly duckling OS/2 to have got so far towards being a swan. OS/2, to switch the metaphor, is the answer to that old biblical puzzle. You'll recall how, in Judgments Ch 14, Samson puts a riddle before the people: "Out of the strong came forth sweetness." Don't be daft, the people replied, how can a big old tough multinational like IBM deliver "sweetness", whatever that might mean. But they haven't seen what Samson's just seen: the corpse of a lion with a swarm of honeybees buzzing around inside it.

OS/2 is sweet and buzzy, and it's evolving fast in total defiance of the Stew scenario. And how on Earth can that scenario be stretched to accommodate

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**L I N U X**

Linux? One of the exciting things about CP/M back in the very early eighties was that lots of it didn't work very well and you had to spend a significant amount of your time (well, I did, anyway) twiddling about with a debugger at machine code level. Access to the source code would have been a handy luxury.

Well, today you have all that with Linux. You're tweaking and twiddling just like the good old days, but no longer having to do so blind. And it's fun. Last night I made some mods to the Linux CD-ROM driver for my Apricot Xen II LS and recompiled the kernel. I can't say the mods made any great improvement, but the damn thing still worked after I'd messed about with it at C code level, and if you know me you'll know that's some kind of triumph.

We'll do that awk next month. Promise.

### 32-Bit Goodness revisited

Making mistakes can make you friends. Back in December I did a separate piece about "32-bit Goodness", the theme of which was why bother with 32-bit computer systems anyway. One elementary advantage, I said, was what the move up to 32 bits does for MAXINT, the largest

number the system can handle as an integer. A signed integer in a 16-bit system is 15 bits long, so the MAXINT is  $2^{15}$ , or 32,768. A rather meagre top limit for many real world tasks like logging airmiles. And I said: "In moving from a 16-bit to a 32-bit environment, MAXINT rises from plus or minus 32,767 to around 200 million."

Readers rushed to their machines to email me, in the politest possible way, that in a 32-bit system MAXINT would be  $2^{31}$ , which is only "something around 200 million" if you allow an error of a whole order of magnitude. The number is actually around 2,000 million. dale@cix.com-pulink.co.uk was the first to point this out. Normally you pass the blame to the magazine's sub-editors for this kind of mistake, but in my original text I'd rather foolishly repeated the number in words in the following paragraph. So it's a fair cop.

I got a lengthier argument from Andrew Cruickshank, acruickshank@cix.com-pulink.co.uk. Andrew turns out to be the Technical Consultant for a company called MR-Memex that does a free text retrieval system. He's one of these people who likes to hack away at machine code level, and from that perspective he can throw an

interesting light on the downside of 32-bit computing. One of the big advantages, I'd said, was that a 32-bit data bus lets you move data in and out of memory twice as fast. Andrew points out that a lot of the data we handle in real life isn't inherently 32-bit. Text, many kinds of database record, pointers to data, and internal housekeeping information are usually just single bytes. And where they are 32-bit, as in the case of fully qualified pointers, there's still a catch. "Unfortunately Intel didn't see fit to put in instructions to do most of the work in handling them as 32-bit quantities in their 16-bit architecture, so moving them about is very inefficient... The upshot is that some 32-bit code will halve the rate of data access over the main memory bus...". He points out that the faster cycle speed of 32-bit processors will usually mask this effect, but that it remains a fundamental inefficiency.

Andrew is also suspicious about my enthusiasm for the flat memory model that 32-bitness brings to the Intel chip family. I won't repeat the pro flat model argument here, except to say that very loosely it gives programmers the same kind of advantage that an organisation might expect from moving out of a 19th century building made up of small rooms, into a modern open plan office. "Where the flat memory model screws up," says Andrew, "is with dynamic linking and thread local storage. NT has to go through hoops to perform dynamic linking by mapping in libraries into the flat memory model of the parent process." The way Windows NT implements thread local storage is "pure hackery", according to Andrew — and I don't think he means it as a compliment.

There's tons more stuff in Andrew's mailing, but I think it gets a bit too technical for many of my readers (Translation: it was right over my head). But his conclusion is worth repeating here: "The real answer is not 32-bit CPUs and operating systems by themselves, but decent programming tools that enforce best use of their capabilities. These tools don't exist as yet and a lot of programmers don't have much feel for what lies underneath their source code." (Anyone who wants the full 10-minute argument can drop me a line, and with Andrew's permission I'll copy his very erudite mailing to them.)

## Big Old Drives

I've been emailed by lots of readers asking where you can get the one-gigabyte drives I mentioned in the February issue. The first to arrive was from Derek Brough, drb@doc.ic.ac, and he seemed to think I was talking about SCSI drives. I wasn't. They were actually advertised as ESDI (Enhanced Small Device Interface), a standard now pretty well ousted by SCSI and IDE, but offering a very decent performance if you have the appropriate host bus adaptor. This is what I meant when I described them as "old technology", that and the fact that they're full height 5.25in form factor.

So that you can appreciate the entertainment value of Derek's message, here's the reply I sent him:

From: bidmead@cix.compulink.co.uk (Chris Bidmead)  
Derek —

I've had a flyer advertising these drives pinned on my wall for the past three months, and as luck would have it I threw it in the wastepaper basket in a massive office clearout LITERALLY THIS MORNING!

It being a Monday, our nice cleaner Betty promptly emptied the wastepaper basket into our dustbin. As I work from home, it's now nestling there among the dirty nappies, empty tomato soup cans and tea dregs.

=====LATER=====

With a dedication to duty (and my readers) that you had jolly well better appreciate, I have just rolled up my sleeves and gone outside with a torch to search for the flyer!

AND HERE IT IS!!!!

(Dated November 1994, so no guarantees they'll still be in stock)

Commonside PLC, Unit 13, 193 Garth Road, Norden, Surrey SN4 4LZ

Tel: 081 330 7533 Fax: 081 330 4838

The drives are Micropolis 1538-15's. 1 gig unformatted. £150.

=====LATER STILL=====

I've just rung them and talked to Ian Wilkie of Commonside. He says the drives are still in stock, and he also stocks the Ultrastore fast ESDI controllers you'll need to go with them. They're £75.

Let me know how you get on with them...

el bid

## PCW Contacts

Chris Bidmead is a consultant and commentator on advanced technology. He can be contacted as bidmead@cix.com-pulink.co.uk



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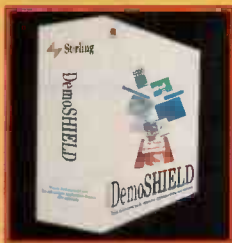
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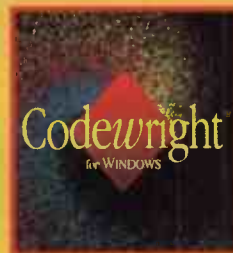
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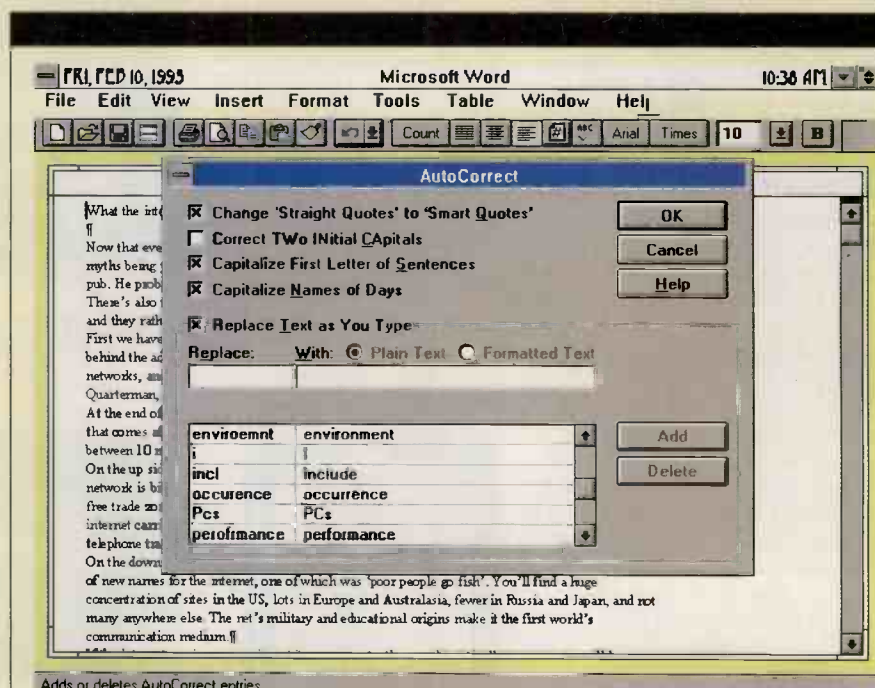
**WP packages contain many features to improve your productivity and even the Options menu can hold undiscovered benefits. Having whipped his Autocorrect into shape and tackled the vexing problem of changing printers, Tim Phillips solves an Ami Pro defaults problem.**

As this my first column for PCW I'm going to pin my colours to the mast: Word for Windows is by far the best word processor for the PC. But now I'm going to backtrack a little and say that Word is only the best as long as you have a 486SX or better and enough RAM — and we're talking 8Mb here. On a 4Mb machine it works okay but tends to chug.

The other prerequisite is to spend half

an hour getting up to speed with its little tricks and benefits. Around 1990, the major Windows packages kept leapfrogging each other with new features by the shovelful. Nowadays the tactic is more one of adding smaller productivity features and fixing the links to other applications. This is a feature of the trend towards selling suites.

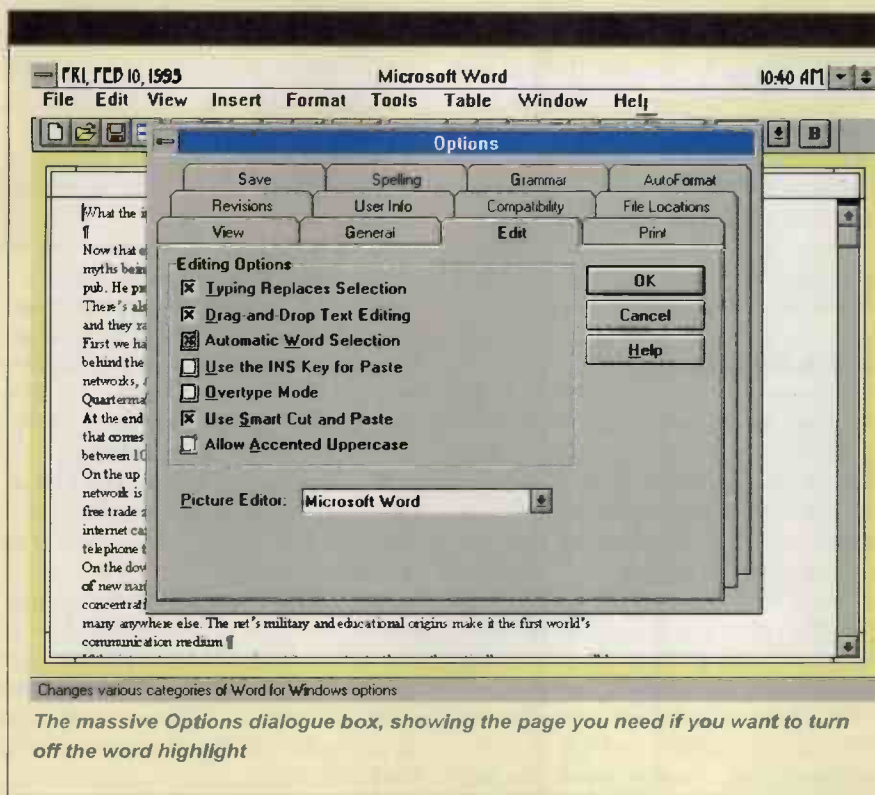
Word for Windows 6.0 has several of



Adds or deletes AutoCorrect entries

The AutoCorrect dialogue. Note that it's not just for typing errors: you can use it to enter "short forms" for words as well





these productivity bonuses. Although I enjoy them enormously they seem to raise the hackles of a number of correspondents, notably one who argued about the uselessness of AutoCorrect for half an hour. This seems such a strange thing about which to complain that I'm going to try and make sense of AutoCorrect now, in the hope that he might be reading this. For the uninitiated, this feature lurks on the Tools menu in Word for Windows and corrects your typing as you go, according to a simple set of rules provided by you.

Unfortunately, its usefulness is curtailed in that it won't always do what you tell it. I spend my life typing Windows with a small "w" and I can't set Word to AutoCorrect the mistake. Nor can I set it to accept more than one initial capital at the beginning of a word and make the subsequent ones lower case, as I often write about CD-ROMs. Point taken, these are disadvantages. But let us not get sidetracked by these. Like me, adopt a faster

typing style: I use AutoCorrect to substitute "managing director" every time I type "md" and "word processor" every time I type "wp". The downside of this is that when I come to use another word processor package I can never believe how bad my typing has become. This keeps me locked in to Word. There's a lesson here, and Lotus and Novell should take note.

Another thing that surprises me is how few users take note of Options, the last item on the Tools menu. Do use this facility. Word has many more customisable options than other word processor package and it dumps them all into one big filing cabinet of a dialogue box rather than scattering them throughout the program. The result is that a number of users miss them and assume there's no alternative setup to the Microsoft standard.

For instance, highlighting a portion of the document using the mouse will highlight whole words whether you point at the middle or the end of a word. This drives at

### Fig 1 Days And Dates The Gregorian Way

```

Given  d: day of the month, 1 to 28, 29, 30 or 31
       m: month, 1 to 12
       y: year
then:  ya=y
       If m<3 then ya=ya-1
       ya=ya Mod 400
       n=(ya+ya Div 4-ya Div 100+ Val Mid$("621462403513",m,1)+d) Mod 7
       If n=0 Then d$="Monday" (...="Tuesday", and so on for each day of
the week).
```

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least two people I know up the wall, but it takes seconds to uncheck the box that does this. Personally, I'm happy to let it go. When dragging highlighted text, Word also organises the spaces around it so you don't have to highlight a space at the front and drag it to exactly the right place.

I'm not pretending that Word is perfect, but a bit of time spent familiarising yourself with it pays off handsomely.

#### Not quite perfect

Font problems in WordPerfect for DOS are troubling Mr Hawkes in Darlington and I understand his concern. Having set up WordPerfect he has discovered that only his printer fonts are available, whereas he would like a lot more, and bigger fonts too.

There are two alternatives. The first is to move to a Windows word processor. You then have Windows TrueType fonts which will scale and provide you with the advantage of WYSIWYG. This is something WordPerfect 5.1 cannot match, but moving to Windows is perhaps more of a change than you want to make. The second alternative is Bitstream's Facelift 2.0 for WordPerfect DOS. This gives you ten Bitstream typefaces and as well as being able to scale them, you can add patterns, shadows and colour. It also works in LetterPerfect and WordPerfect Works.

Support for extra typefaces and type sizes, even using the best DOS word processors, has never been a simple matter. This has been the driving force behind the conversion of some DOS word processors to a Windows-like GUI interface — WordPerfect being the obvious example. While there isn't the hardware entry barrier that Windows demands, it seems to me that using a DOS word processor like this affords the worst of both worlds. It is a word processor that lacks the speed of a simple character-only model like WordStar 5.0 or WordPerfect 5.1; it also lacks the integrated environment of Windows with luxuries such as standard printer drivers and the ability to cut and paste between applications.

#### Print hints

Mike Humphrey from Bradford University has sent me a helpful hint on the distressing subject of changing printers in Word for Windows. As mentioned in the February issue, when you need to change the printer for a one-off job, Word makes you change the default printer. This is a pain in the extreme so Mike suggests using a toolbar macro. It still changes the default, but it makes it less of a hassle.

"One of the points mentioned was that

it might be preferable to change printers using buttons rather than dialogue boxes. Well, this can be done," says Mike. "First, create a macro (Tools/Macro) called, perhaps, 'PrinterLaser'. Enter the line: FilePrintSetup Apple LaserWriter on FILE:

(take the description of the printer from the printer setup dialogue box). Close the macro, save the changes and then create another for each printer you want to use. Next, select View/Toolbars and create a new toolbar. The name does not matter; say "Printers". Then, in the Customise box, scroll down the list to Macros. Drag each of the new macros to the new toolbar, selecting buttons when applicable and then OK. And there it is — a toolbar for changing printers."

Jon Moorby offers a similar fix and suggests creating a number of macros for all your printers, calling each macro a printer-specific name. This helps to identify which printer to select as its macro name pops up when you hold the mouse pointer over the toolbar button.

Ettrick Thomson from Aldeburgh correctly points out that the program designed to name the day of the week for any date in history does no such thing. Instead, it gives the correct day for every date in the Gregorian calendar, which only existed in the UK from 14th September 1752. The Julian calendar which existed before it is a very different matter. However, an alternative and much shorter version for the Gregorian Calendar is suggested in Fig 1 (see page 599).

Ian Sykes from Inverness provides a hint for WordPerfect users who save to floppy disk — he recently managed to recover an accidentally lost document by saving another file with the same name allocated to it. WordPerfect saves backup files with the .BAK extension on the hard disk, even if you are saving to floppy. So always use this as your first step — it will be there if you look for it.

In this case, another WordPerfect session had covered the .BAK file but the document remained; Mr Sykes used DOS UNDELETE to find it. This raises two important points. First, DOS is not totally useless after all; second, whenever you're in a crisis situation, always look for backups or autosaved versions on the hard disk. I might add, "don't save only to a floppy", but that's another matter...

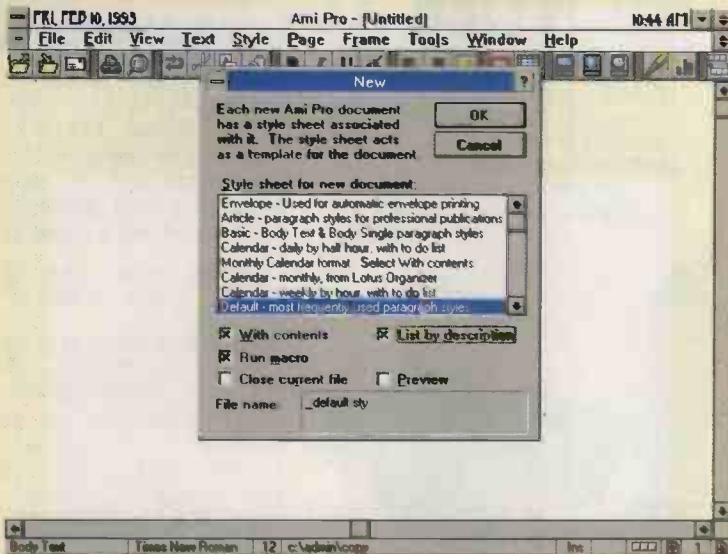
#### Macro madness

Stuart Johnson of Clapton, East London has had problems with Lotus Ami Pro: it unilaterally changes his default settings.



Fig 2 Ami Pro Workaround

```
Function Envelope()
x=getprofilestring$("amipro","initview","amipro.ini")
y=getprofilestring$("amipro","defoptions","amipro.ini")
z=getprofilestring$("amipro","defstyle","amipro.ini")
call oemenv.smm!envelope()
LoadOptions(x,y,z)
END FUNCTION
```



Ami Pro's  
offending  
List by  
Description  
checkbox. If  
yours keeps  
changing,  
don't worry:  
you are not  
going mad

"The List by Description option seems to turn itself off at odd times. I set it to list by filename and the checkbox changes by itself. Can you help?" he asks.

According to Lotus the problem is caused by the envelope macro, which is an unfortunate byproduct of Ami's decision to add such features as macros. When it creates a new document or envelope it resets the flag. Luckily, Ami Pro technical support has a workaround: rename the existing AMIENV.SMM file to OEMENV.SMM then copy the file in Fig 2 (above) into a blank document.

Save the document as a macro to the name AMIENV.SMM. Create a new document and ensure that List By Description is set to ON. Create the document, then exit and restart AmiPro. Having completed this, running the envelope macro should never again toggle that option off.

Ray Pickard of Keighley is one of the loyal band of WordStar users. He has a copy of WordStar 5.0 and wants to print to the end of a document from a certain page. How does he tell WordStar to do this? It's not so easy unless you upgrade a little; I understand that there is a new feature available for users of WordStar 6.0. In the Page Numbers field in the Print dialogue box you type a hyphen after the page number from which you want to start. So to print from page six onwards, the

command would be "6-". For users of earlier versions it's not so straightforward. You have to know how long the document is, and enter that as the last page in the dialogue box.

Finally, Sean Hignett of Edinburgh is interested in taking data from an Apple II. He has some files on his Apple, written in Screenwriter II, which he would like to transfer:

"I upgraded to a 486 approximately 18 months ago but from time to time I have required access to text files stored on the Apple IIe. The best that either Apple or data transfer specialists could suggest was to send the files down a null modem and use a capture program on the PC. I have tried this and it does not seem to work," he says. Regrettably I am unable to help him. Although Sean knows of software to do the conversion, I can't find it. I've been trying for a solution on this one for a while but with no luck, so I'll have to pass it over to you.

## PCW Contacts

And that's that for this month. Surface or airmail to PCW, otherwise I'm on email at [wong@cix.compulink.co.uk](mailto:wong@cix.compulink.co.uk) and CompuServe 100436,3616

## GUARANTEED DISKS & COMPONENTS CABLES

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| LAPLINK SERIAL DUAL PIN OUT CABLE   | £7.95       | 386SX40                              | £44.00  |
| LAPLINK PARALLEL/INTERLINK 25M/25M  | £7.95       | 386DX40 128K Cache                   | £64.00  |
| SERIAL AND PARALLEL CABLE   | £15.50      | 486DX33 256K C.VL Green 4x30 2x72    | £129.00 |
| <b>SCSI CABLES</b>  |             | 486DX33 256K C.VL Green 4x30 2x72    | £145.00 |
| SCSI 4 HEAD INTERNAL CABLE  | £7.50       | 486DX46 256K C.VL Green 4x30 2x72    | £205.00 |
| SCSI 5 HEAD INTERNAL CABLE  | £8.75       | <b>CPU'S</b>                         |         |
| SCSI 8 HEAD INTERNAL CABLE  | £18.95      | 486SX33                              | £52.00  |
| SCSI TO PARALLEL 25M EXTERNAL   | £9.50       | 486SX33                              | £62.00  |
| SCSI TO SCSI EXTERNAL CABLE 2M  | £11.95      | 486DX2-66                            | £155.00 |
| SCSI TO SCSI 2 EXTERNAL CABLE 1M  | £19.95      | PENTIUM 40                           | £290.00 |
| SCSI 2 TO SCSI 2 EXTERNAL CABLE 1M  | £24.95      | PENTIUM 90                           | £395.00 |
| SCSI 50M IDC TO SCSI 50F CENT   | £24.95      | <b>MOTHERBOARDS NO CPU</b>           |         |
| THE ABOVE CABLES ARE USED TO CONNECT AN ON BOARD SCSI CONTROLLER TO AN INTERNAL SCSI DEVICE |             | 486 256K C.VL Green 4x30 Pin 2x72Pin | £69.00  |
| <b>SCSI TERMINATORS</b>   |             | PENTIUM 40/66 512K C                 | £185.00 |
| SCSI 1 TERMINATOR PASSIVE   | £9.50       | PENTIUM 90 512K C                    | £195.00 |
| SCSI 1 TERMINATOR ACTIVE  | £10.95      | <b>CASES</b>                         |         |
| SCSI 2 TERMINATOR   | £19.95      | MINI TOWER CASE WITH AUTO LED        | £39.00  |
| <b>MONITOR CABLES</b>   |             | DESKTOP CASE WITH AUTO LED           | £37.00  |
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| SVGA EXTENSION CABLE 15M/15M 4M   | £9.95       | BIG TOWER CASE WITH AUTO LED         | £75.00  |
| SVGA/GA MONITOR 15M/15M 2M  | £7.95       | <b>POWER SUPPLIES</b>                |         |
| SVGA 15M TO 5 BNC 2M  | £24.95      | DESKTOP/ MINI 200W PSU               | £27.00  |
| VGA/GA MONITOR CABLE 9M/15M 2M  | £7.95       | MINI / DESKTOP / FULL TOWER 120W     | £35.00  |
| EGA/VGA MONITOR CABLE 9M/9M 2M  | £6.95       | MINI / MIDT / DESKTOP / FULL 250W    | £40.00  |
| MONITOR/HOUSE EXTEN. 9M/9M 2M   | £6.95       | MINI TOWER PSU 100W                  | £47.00  |
| <b>PRINTER CABLES</b>   |             | <b>FLOPPY DRIVES</b>                 |         |
| PARALLEL PRINTER CABLE 1.8M   | £2.95       | 5.25" 1.44MB FLOPPY DRIVE            | £22.00  |
| PARALLEL PRINTER CABLE 3M   | £7.95       | <b>SVGA CARDS</b>                    |         |
| PARALLEL PRINTER CABLE 10M  | £10.95      | SVGA 39 COLOUR 1024x768              | £135.00 |
| PARALLEL CABLE 10M (SCREENED)   | £22.95      | SVGA 28 COLOUR 1024x768 MPMU         | £159.00 |
| PARALLEL CABLE 15M (SCREENED)   | £27.95      | SVGA 28 COLOUR 1024x768              | £175.00 |
| PARALLEL CABLE 20M (SCREENED)   | £32.95      | <b>HARD DRIVES</b>                   |         |
| SERIAL PRINTER CABLE 25M/25F 2M   | £7.95       | 260MB HARD DRIVE                     | £115.00 |
| <b>MODEM CABLES</b>   |             | 140MB HARD DRIVE                     | £135.00 |
| MODEM CABLE 25M/25F 2M  | £6.95       | 120MB HARD DRIVE                     | £150.00 |
| MODEM CABLE 9M/25M 2M   | £6.95       | 40MB HARD DRIVE                      | £179.00 |
| MODEM CABLE (INTERNAL MODEMS)   | £6.95       | <b>CONTROLLERS</b>                   |         |
| <b>NULL MODEM CABLES</b>  |             | PLA TIO DO CARD 25M/1P/G             | £8.00   |
| NULL MODEM CABLE 9M/9F 2M   | £6.95       | DESKTOP PLAT TIO 2500X/DO/25/1P/G    | £9.95   |
| NULL MODEM CABLE 9M/9F 2M   | £6.95       | PLA TIO 2500/2500X/1P/G V/L          | £13.95  |
| NULL MODEM CABLE 25M/25F 2M   | £6.95       | <b>MEMORY</b>                        |         |
| EXTENSION CABLE PC 25M/5M   | £5.95/£8.95 | 256K 30PMS SIMMS                     | £12.00  |
| EXTENSION CABLE PC 25M/25M  | £5.95/£9.95 | 256K 30PMS SIMMS 138P 70NS           | £26.95  |
| <b>FDD &amp; HDD CABLES</b>   |             | 1MEG SIMMS 30 PIN 70NS               | £120.00 |
| FDD 5 HEAD FLOPPY DRIVE CABLE 0.8M  | £3.95       | 2MEG SIMMS 30 PIN WITH PARITY        | £125.00 |
| FDD 5 HEAD EXTENSION CABLE 0.8M   | £3.95       | 4MEG SIMMS 72 PIN WITH PARITY        | £410.00 |
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| 3 HEAD LONG IDE HD DRIVE CABLE 1M   | £5.25       | ACER 102 KEYPAD                      | £13.00  |
| <b>SHARER SWITCH CABLES</b>   |             | HEWLETT PACKARD (CHERRY TYPE)        | £17.00  |
| ALL LINES CONNECTED 25M/25M/2M 3M   | £6.95       | HEWLETT PACKARD 1633A D/CAP          | £14.95  |
| ALL LINES CONNECTED 25M/25M/2M 5M   | £9.95       | HEWLETT PACKARD 1633A D/CAP          | £14.95  |
| ALL LINES CONNECTED 25M/25M/2M 10M  | £13.95      | HEWLETT PACKARD 1633A D/CAP          | £14.95  |
| ALL LINES CONNECTED 25M/25M/2M 15M  | £17.95      | HEWLETT PACKARD 1633A D/CAP          | £14.95  |
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| SCSI 250F TO SCSI 1 20M   | £24.95      | HEWLETT PACKARD 1633A D/CAP          | £14.95  |
| SCSI 150M TO SCSI 2 50F   | £24.95      | HEWLETT PACKARD 1633A D/CAP          | £14.95  |
| <b>GENDER CHANGERS</b>  |             | HEWLETT PACKARD 1633A D/CAP          | £14.95  |
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| 30M TO 30M  | £3.95       | HEWLETT PACKARD 1633A D/CAP          | £14.95  |
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Available in internal and external models, they are made to meet the exacting requirements of full BABT approval. The external model is housed in an attractive case which can stand vertically as well as horizontally keeping your desk space uncluttered. They are a faxmodem that you can be proud to own.

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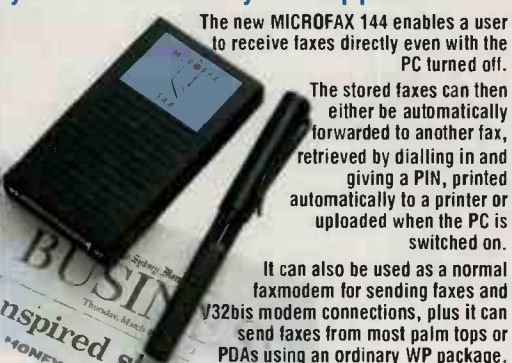
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| PRODUCT                                      | PRICE |
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| XL141 Frontier XL V.32bis Internal Faxmodem  | £95   |
| XL14E Frontier XL V.32bis External faxmodem  | £99   |
| XL281 Frontier XL V.34 Internal Faxmodem     | £179  |
| XL28E Frontier XL V.34 External Faxmodem     | £185  |
| XL14M Frontier XL V.32bis Apple Mac Faxmodem | £99   |
| XL28M Frontier XL V.34 Apple Mac Faxmodem    | £199  |

- V.34 & V.F.C. 28,800 or V.32bis 14,400 bps
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- 16550 card available for external models £29.95
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A pocket modem that can store all your faxes, then send them to you - wherever you happen to be!



The new MICROFAX 144 enables a user to receive faxes directly even with the PC turned off.

The stored faxes can then either be automatically forwarded to another fax, retrieved by dialling in and giving a PIN, printed automatically to a printer or uploaded when the PC is switched on.

It can also be used as a normal faxmodem for sending faxes and V32bis modem connections, plus it can send faxes from most palm tops or PDAs using an ordinary WP package.

|  |      |
|--|------|
| MFAX144 Microfax 144 V32bis Faxmodem                               | £199 |
| MFAX144M Microfax 144 V.32bis Faxmodem for Apple Mac               | £199 |
| MFAX2496 Microfax V22 bis Faxmodem                                 | £159 |
| MFAX-FB Microfax Fax Back Faxmodem                                 | £179 |
| MFAX-BAT Microfax 144 clip on battery pack (needs 4 x AA alkaline) | £22  |

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16550 Frontier 16550 Serial Card with one 16550 port, 1 serial port, 1 parallel port and a games port **£29.95**

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16550SP Single Port 16550 Card **£23.95**



## BOCA AND ZOOM FAXMODEMS

The two leading US Brands

BOCA faxmodems offer exceptional value for anyone looking for quality product without the extra cost that BABT approval entails. Made in Florida they have a 5 year warranty and come with Winfax/Dosfax Lite and COMIT software. These faxmodems are internal in V34 or V32bis versions.

BOCA-321\* BOCA V34 Internal Faxmodem **£159**  
BOCA-321\* BOCA V32bis Internal Faxmodem **£69**

## ZOOM 14.4I & 14.4X

These award winning modems are extremely well made and have features found on few other makes.

- 14,400 fax and data speeds with V42 and V42bis
- Group 3, class 1 and 2 fax operation, 5 yr warranty
- Call Back security and remote configuration
- Software included is COMIT for Windows and DOS communications and Winfax Lite fax software

14.4I ZOOM internal V32 bis faxmodem **£135**  
14.4X ZOOM external V32 bis faxmodem **£135**  
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## ZOOM VFP MODELS

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## VOICE FAXMODEMS

### BOCA SOUNDEXPRESSION

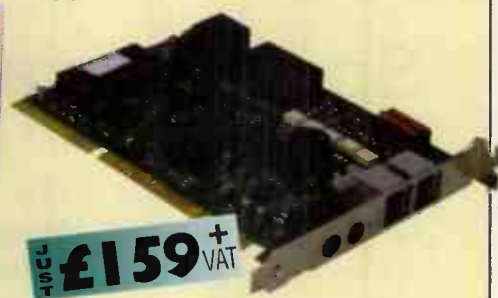
Transforms ordinary PCs into Complete Multimedia Communications Workstations

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Imagine one single PC board that acts as a high speed fax/modem, provides a 16 bit stereo Soundblaster compatible sound, has a CD-ROM interface, works as a hands-free speakerphone (with optional microphone and speakers), and can also answer your phone professionally and take messages while you are out.

- Soundblaster, Adlib and Windows Sound System compatible
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- 1000 password protected voice boxes with remote access
- 14,400 fax and data speeds
- Complete with advanced version of FAXWORKS for automatic reception of all voice and fax calls
- Remote retrieval faxes/messages
- Full MNP 2-5, V.42bis and V.42
- Fax-on-Demand feature
- Automatic Pager notification
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- 5 year manufacturer's warranty

### BOCA Office COMMUNICATOR



The Complete Office Communicator transforms a PC into a complete office communications centre. With sophisticated yet easy-to-use call processing capabilities, including a full duplex speakerphone complete with microphone, professional voicemail and a fast 14,400 bps send/receive fax and data facility.

- Hands-free Speakerphone with full duplex (two way at same time) operation and superb boardroom quality Point and click feature
- Includes electret microphone
- Full voice mail as for Sound Expression
- 14,400 fax and data operation with Class 2 Group 3 fax
- Complete with FaxWorks and Speakerphone software

### BOCA MULTIMEDIA FAXMODEM

The next step down in the outstanding BOCA voice faxmodem range is the Multimedia V32bis voice faxmodem. This is based on the ROCKWELL Business Audio chipset and provides not only 14,400 bps fax and data but also Microsoft Windows Sound System compatible sound directly from the board. This means that any WAV sound file can be played back over the BOCA card either through its built-in speaker or through optional external speakers.

- 14,400 fax and data speeds with full error correction and compression as for other BOCA voice faxmodems (provided through FaxWorks)
- Microphone and Speaker sockets
- Support for Windows Sound System i.e. WAV sound files
- Can be used with an existing sound card and speakers

### ZOOM VOICE FAXMODEM

The Zoom VFP14.4V voice faxmodem offers a 7 year warranty and a specification almost the same as the BOCA multimedia faxmodem. With its built-in Business audio support and FaxWorks software it offers a brilliant integrated alternative to owning a separate faxswitch, faxmodem and answerphone.

- 14,400 bps fax and data Class 1 and 2 Group faxing
- Storage rate of 1.8KB/sec for voice
- Silence detection and decoder interpolation for efficient storage
- Socket for BT phone to be connected for answering calls and recording your own voice prompts

BOCA-SE\* BOCA Sound Expression V32bis **£179**  
BOCA-OC\* BOCA V32bis Office Communicator **£159**  
BOCA-MM\* BOCA Voice V32bis Fax/Modem **£139**  
VFP14.4V\* ZOOM Voice V32bis Internal faxmodem **£149**  
Speakers Speakers for voice faxmodems **£9.95**  
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## Spring into action

**Spring is in the air and a young man's fancy turns to thoughts of love. Unless you're Stephen Wells, when your fancy turns to Excel shortcuts and price sensitivity analysis — the break-even line.**

**S**pring is a time when we review our wardrobes, gardens, job prospects and social life. So it must also be opportunity for Excel users to look up from their screens and ask if they're not missing built-in shortcuts which could help them work faster or smarter.

Here's a shortcut for recording your own styles. Say that whenever you have a title on your worksheet, you'd like it to be in Times, Bold, 14pt, centred in its cell. Prepare a cell that way. Then click the default, Normal, in the Style Box. (That's the box that shows the font in many Windows applications but shows the current style in Excel.) Rename the style to, say, Titles.

When you move to another cell, the Style Box will be, say, Normal again. But you can select another cell, or block of cells, click the down arrow next to the Style Box, and at the bottom of the list will be your new style name, Titles. Click that and the job's done.

Another way of setting a global style is to open a new sheet, select as large a block as you think you'll ever need, like A1 to Z100 perhaps, and format it with the font, row heights, colours and so on which you prefer. Then save the sheet as **FILENAME.XLT** in the **excel\start** directory. From then on, every time you use the New command in Excel's File menu, this template will appear on Excel's list of file types.

You could store two formats of Balance Sheets, for example. If you stored the templates as **BALSHET1.XLT** and **BALSHET2.XLT** in the **excel\start** directory, these names would appear between Workbook and Slides in the list that

mula, Note and type away in the Text Note box. If the Note Indicator is checked, a little dot (default colour, red) will appear in the cell. If the Info Window option is checked, you can choose Window and you'll find **Info: worksheet name**. Choose that and you'll switch to a report telling you everything you want to know about the active cell including the underlying formula, assigned formats, associated references and names, and your cell notes.

There is another way to display the Info Window whether it's checked under Options, Workspace or not. Just press **Ctrl+F2**. It's an override as it displays the report, automatically checks the Workspace box, and adds the report name to the Window list.

Once you've written a note in a cell, you don't need to choose Formula, Note again. Just double-click the cell to edit or add to the note.

|    | A                          | B      | C     | D     | E     | F     | G     | H     | I      |
|----|----------------------------|--------|-------|-------|-------|-------|-------|-------|--------|
| 75 | Break-Even                 |        |       |       |       |       |       |       |        |
| 76 | Operating Expense + Income | 2553.2 |       |       |       |       |       |       |        |
| 77 | Cost of Sales in pence     | 0.6470 |       |       |       |       |       |       |        |
| 78 |                            | 0.33   | 0.30  | 0.28  | 0.25  | 0.23  | 0.20  | 0.18  | 0.15   |
| 79 | Price Reduction %          | 1.08   | 1.17  | 1.27  | 1.40  | 1.55  | 1.74  | 1.98  | 2.31   |
| 80 | Sales Increase %           | 7.62   | 16.50 | 26.98 | 39.53 | 54.83 | 73.90 | 98.33 | 130.74 |
| 81 | Price Sensitivity Analysis | 2.5    | 5.0   | 7.5   | 10.0  | 12.5  | 15.0  | 17.5  | 20.0   |

**Fig 1** The results for the Example Company in the Break-Even section of the template

appears when you choose New from the File menu. That's after the standard choices, Worksheet, Chart, and so on. The advantage of creating your own template this way is that you can include other preferences like special headings or no grid lines.

Colour can help. On the financial analysis template which I've supplied to readers, I've marked the cells where data is to be entered in yellow. Some people like to mimic the appearance of green-ruled listing paper. All you do is hold down **Ctrl** while you click alternate row numbers in the border. Then choose **Format, Patterns, Foreground, green**.

You can do a lot of tailoring by clicking **Options, Workspace**. You can change to **R1C1** format. And you can activate the **Info Window** and **Note Indicator** options, both of which are better than having scraps of paper around to remind you why you put a certain formula in a certain cell.

To make a note, you just choose **For-**

The **Options, Workspace** box also can help you pick up space on your view of your worksheet. You can turn off the **Formula Bar** at the top and the **Status Bar** at the bottom of the screen, and you can kill the vertical and horizontal scroll bars. The toolbar, of course, is shown or hidden not under **Workspace** but via **Options, Toolbars**.

A faster way to take a quick squint at more of your worksheet is to choose **Window, Zoom, 75%**.

To close down, you may double-click in the upper-left corner of each worksheet. But if you have a number of worksheets open, did you know you can close them all down at once? Just hold down the **Shift** key while you click on the **File** menu. The command **Close** will now be **Close All**. Another few seconds saved.

Incidentally, on several worksheet and chart menus, **Shift** can stand for **Picture**. So on the **Edit** menu, pressing **Shift** with a mouse click changes **Copy** to **Copy Picture**, **Paste** to **Paste Picture**, and **Paste Link** to **Paste Picture Link**.

The **Shift** key can also expand the uses of the spacebar. If you have a single cell



selected, to select its entire row, press Shift+spacebar. If you have more than one adjacent cell selected in a column, pressing Shift+spacebar will select multiple rows. That means, if you have three cells selected in a single column, pressing Shift+spacebar will select all three corresponding rows.

The variations with the Ctrl key are easier to remember if you think of C for Ctrl and C for Column.

If you have a single cell selected, to select its entire column, press Ctrl+spacebar. If you have more than one adjacent cell selected in a row, pressing Ctrl+spacebar will select multiple columns.

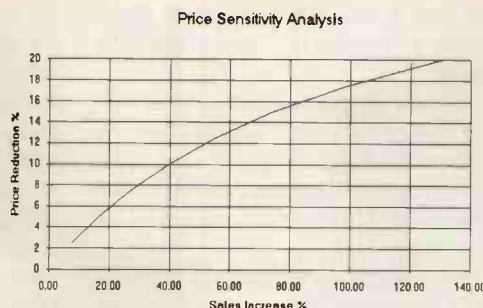
### Breaking even

Since last September's issue, this column has included a running series on financial analysis. Month by month I've been building the listing of a template which can be used with any spreadsheet to calculate five significant Liquidity Ratios, three Leverage Ratios, ten Activity Ratios and four Profitability Ratios from five years of Income Statements and Balance Sheets for any business which carries stock. That's retail, wholesale or manufacturing companies.

Many readers have sent for the template on disk, often including complimentary remarks or interesting comments. One reader said he was going to compare the results of the template with those from a template provided by the Finance Lecturer for his MBA course some years previously. This stirred memories for me because I was first turned on to the subject in management classes at the University of Southern California.

But the letter made me realise that I should emphasise that this template holds no magical mysteries. Cell by cell I have explained how every ratio is produced. If another template should give different results, look at the underlying formulas and see what is being calculated.

Never was this caution more appropriate than this month when we look at price sensitivity analysis, or, as it is considered in some businesses, the break-even line. Many professional financial analysts would probably say that this isn't their department at all. Fine. But price sensitivity analysis is of concern to managers of businesses and it is easy to include in the template while we're at it.



(Top) Fig 2 A Price Sensitivity Analysis curve based on the results in Fig 1

(Above) Fig 3 The same results expressed as a straight Break-Even line

Different industries can have divergent attitudes to pricing. In the last few years, there have been skirmishes of advertised special values among supermarkets. Real savings or not, they typify the competitive market forces attitude of food retailers. But when the government made a cutback of subsidy to British Rail last year, a spokesman for them seemed to reflect the socialist approach. He said that fares would have to rise as costs had to be distributed between their customers no matter how few people travelled with them.

Some small-business owners feel that their major objective is to increase turnover. And probably as many think that they can usually boost sales by reducing prices. There is enough truth in both concepts that other considerations are frequently ignored.

A manager will say, "The company can't afford not to reduce prices." Price sensitivity analysis is concerned with whether the company can indeed afford it.

The subject here is not reductions in price for a small portion of the company's sales year, like a year-end sale; or price cuts for products which are a small part of the company's total range (loss leaders), but with average overall reductions in prices.

It is not always realised that for many companies it takes a considerable increase in sales to compensate for a



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## Listing for Break-Even

|     |                            |
|-----|----------------------------|
| A75 | Break-Even                 |
| A76 | Operating Expense + Income |
| B76 | B29+B30                    |
| A77 | Cost of Sales in pence     |
| B77 | B27/B22                    |
| B78 | (100-B81)/100-\$B\$77      |
| C78 | (100-C81)/100-\$B\$77      |
| D78 | (100-D81)/100-\$B\$77      |
| E78 | (100-E81)/100-\$B\$77      |
| F78 | (100-F81)/100-\$B\$77      |
| G78 | (100-G81)/100-\$B\$77      |
| H78 | (100-H81)/100-\$B\$77      |
| I78 | (100-I81)/100-\$B\$77      |
| A79 | Price Reduction %          |
| B79 | \$B\$76/B78/\$B\$22        |
| C79 | \$B\$76/C78/\$B\$22        |
| D79 | \$B\$76/D78/\$B\$22        |
| E79 | \$B\$76/E78/\$B\$22        |
| F79 | \$B\$76/F78/\$B\$22        |
| G79 | \$B\$76/G78/\$B\$22        |
| H79 | \$B\$76/H78/\$B\$22        |
| I79 | \$B\$76/I78/\$B\$22        |
| A80 | Sales Increase %           |
| B80 | (B79-1)*100                |
| C80 | (C79-1)*100                |
| D80 | (D79-1)*100                |
| E80 | (E79-1)*100                |
| F80 | (F79-1)*100                |
| G80 | (G79-1)*100                |
| H80 | (H79-1)*100                |
| I80 | (I79-1)*100                |
| A81 | Price Sensitivity Analysis |
| B81 | 2.5                        |
| C81 | 5                          |
| D81 | 7.5                        |
| E81 | 10                         |
| F81 | 12.5                       |
| G81 | 15                         |
| H81 | 17.5                       |
| I81 | 20                         |

relatively small reduction in prices.

If you have been entering the template from the listings, you'll be up to row 74. This month no replication is required. The full listing for columns A to I of rows 75 to 81 is given in the panel above.

As before, to provide an illustration, we are using the results from the sample Balance Sheet figures given in last October's issue and the Income Statement results given in November.

If you use those figures, you can check that you've entered the formulas correctly by comparing your results with Fig 1.

Fig 2 is a Price Sensitivity Analysis chart generated from the same figures. The chart shows the increases in sales that the company would need to make to compensate for various percentage reductions in overall prices. It's based on the following variables from the latest financial

year: Net Sales, Cost of Goods Sold; Operating Expenses, and Operating Income.

Readers who have sent for the template in Excel 4 format should open the file, EXAMPLE.XLS. Press F5 and enter A80 to reach the starting cell. Select the block, A80:I81. Press F11 or choose File, New, Chart.

The New Chart dialogue box will have First Row Contains First Data Series as the default. Choose instead, Category X Axis Labels, OK. A bar chart will appear. Select Gallery, XY Scatter, chart type 3.

On the new chart, click the curving line of marker points. Press the RMB (Right Mouse Button) and choose Patterns; Line, Automatic; Marker, None; OK.

Click the Y axis. Press the RMB, choose Attach Text and click OK (for Value Y axis). In the formula bar, delete the Y and insert an equals sign. Press Ctrl+Shift+F6 to return to the worksheet. Select cell A79, Enter. This will return you to the chart and label the Y axis.

To label the X axis follow a similar procedure but point to the cell A80.

Click the title, Price Sensitivity Analysis, which was entered automatically. If you press the RMB and select Font, and increase the size to 14pt, your screen should now look like Fig 2. Save the chart.

Some managers prefer to think in terms of a straight break-even line. Above it, they're in the black. Below it, they're in the red. And they may be more used to seeing price reductions descending down a chart. No problem. Simply choose Gallery, Area, chart type 1.

Click the Y axis, press the RMB, choose Scale, Values in Reverse Order.

Double-click below the resulting line and the Patterns dialogue box will appear. Under Area, select Custom, Foreground red, Background white. Then double-click above the line and in the Patterns box, under Area, select Custom, Foreground white, Background red.

The X and Y axis are already labelled. Select the main title. Delete the existing title in the formula bar, and insert an equals sign. Press Ctrl+Shift+F6 to return to the worksheet. Select A75, Enter. This changes the main title to the more appropriate Break-Even.

Your screen should now look like Fig 3.

Examining the worksheet, cell B76 holds Operating Expenses + Operating Income for the latest year. Cell B77 calculates Cost of Sales in pence by dividing the Cost of Goods Sold by Net Sales.

Row 81 simply provides a scale of calculation points from 2.5 in cell B81 to 20 in

I81. It provides the vertical, or Y-scale, on the chart. It means that we will see what happens with price reductions from 2.5% to 20% at 2.5% intervals. I've only picked these points to give you an example. If you want to see what happens with another business using other potential reductions, change the figures here on row 81.

Rows 78 and 79 are just parts of the calculation. B78, for instance, translates to (100-2.5)/100-Cost of Sales in pence. B79 is Operating Expense + Income/B78/Net Sales.

Row 80 provides the value points along the horizontal or X-scale.

Whether looking at the tabular results for our Example Company in Fig 1, or the charted results in Figs 2 and 3, the interpretation is the same: if, for a full year, prices are reduced overall by 10% then, based on the latest year's results, to maintain the same level of profitability, sales would have to increase about 40%.

The Y (vertical) axis shows the percentage price reductions contemplated. The X (horizontal) axis shows the percentage sales increases which would be needed if there is to be no drop in income.

It is assumed that the cost of goods remains at the same percent of sales and that the operating expenses also remain as in the latest fiscal year.

Obviously, if the cost of goods or the operating expenses can be reduced, there may be a case for experimenting with a price reduction. But without these savings it can be seen from the chart that sales increases sufficient to compensate for the reductions in price would be hard to achieve, particularly when it would probably take increases in operating expenses (like advertising the price cuts) to accomplish these sales increases.

For many companies it is more profitable to increase the perceived added value to customers rather than decrease prices overall, particularly if this can be done without increasing operating expenses.

As with most financial worksheets, you can try out alternative scenarios. Just enter new figures in the Income Statement section of the most recent year.

## PCW Further details

Stephen Wells welcomes feedback on spreadsheets via PCW Editorial at the usual address or at [stephen\\_wells@pcw.ccmil.com](mailto:stephen_wells@pcw.ccmil.com). For the financial analysis template for companies which carry stock, in Excel 4 format, send a formatted 3.5in disk and a stamped, self-addressed envelope.



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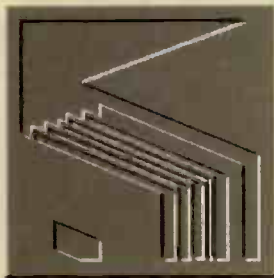
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## Behind the painted smile

**Mark Whitehorn considers phone code and postcode input masks and shows you how to edit these. And he returns to Codd's rules, quoting and explaining two further pieces of wisdom on relational databases.**

**M**any RDBMSs provide tools for error trapping at the moment data is entered into your database; an example of this is the Input Mask in Access. It's an excellent idea, especially when you find that the table Wizards will automatically build input masks for you when you select a phone, fax number or postcode field. Even better, these have been localised for the UK market.

However, on Phoneday (16th April) the input mask for telephone numbers will no longer be correct. Its present form is: \(\9999\) "00090009 which means that entries start with an open bracket, followed by four spaces or numbers, followed by a

closing bracket and a space. Next come three obligatory numbers, a space or a number, three more obligatory numbers and lastly a space or a number. The FaxNumber input mask is identical. As things stand, that mask will cope with the 071 123 4567 major city type numbers and also the 0234 567890 type, but as from Phoneday the extra "1" which is being added to most dialling codes makes things fall apart rather badly. The input mask simply requires editing to add a further 9 digit to the first part of its description, giving: \(\99999\) "00090009.

When it comes to postcode input masks, you don't have to wait until

Access's is wrong — it has always been that way. It takes the form: >LL00\ 0LL. This means you are obliged to have a postcode with two letters followed by two numbers, then a space, one number and two more letters. This is less than ideal because legal postcodes are composed of two letters followed by a number (e.g SW1). Although another letter or number is allowed, it is not compulsory (e.g SW24 or SW1A). Finally there is then always a space, another number and two more letters, all of which are obligatory.

A quick check reveals that Access's input mask will refuse many perfectly legitimate postcodes such as DD1 4HN for instance. The mask is vastly improved by editing it to be: >LL0a\ 0LL with the lower case "a" signifying that you can enter either a letter or number or that entering neither is equally acceptable.

Bear in mind that input masks, whatever the RDBMS, are double-edged swords. They stop users entering nonsense into data fields and this is a great boon; remember "GIGO" (garbage in = garbage out). On the other hand, input masks may refuse data which is different or unusual but not garbage, for example; European telephone numbers or American zip codes.

### Codd's Law

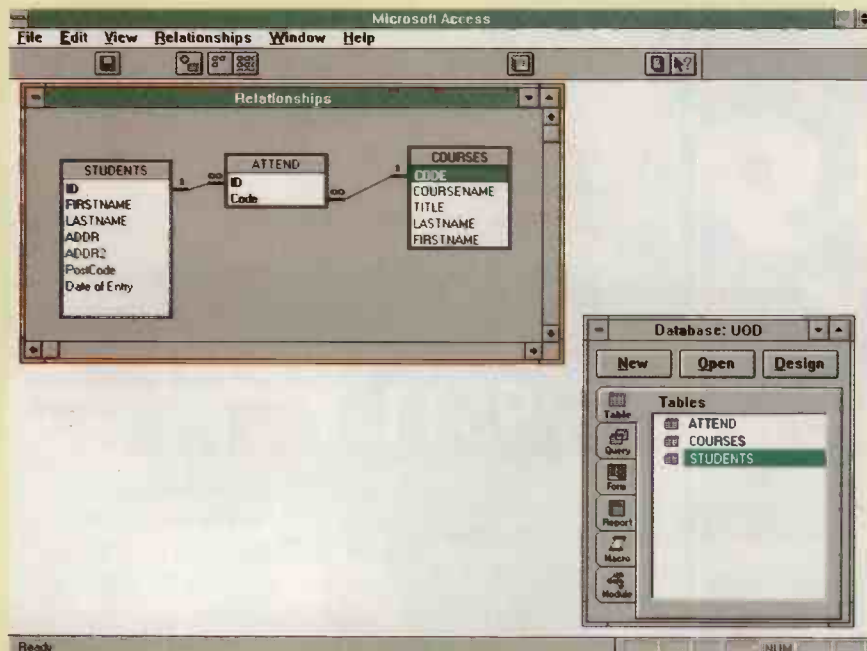
Since having covered Ted Codd's Rules numbers 0 and 1 in an earlier article, I have been led astray by red herrings but am now returning to continue with Rule 2 (okay, so they weren't really red herrings, but the fishy allusion was irresistible).

• The guaranteed access rule

*Rule 2: Each and every datum (atomic value) in a relational database is guaranteed to be logically accessible by resorting to a combination of table name, primary key value and column name.*

Examining the terminology, "datum" is the singular form of data or in other words,

*The structures of three simple tables which demonstrate a many-to-many join. The emboldened field names are those which form the primary keys*





Microsoft Access

File Edit View Format Records Window Help

Database: UOD

Datasheet View

Table: STUDENTS

| ID | FIRSTNAME  | LASTNAME   |
|----|------------|------------|
| 1  | MIKE       | WELLINGTON |
| 2  | SALLY      | JONES      |
| 3  | TZANOVICH  | SMITH      |
| 4  | GEOFFREY   | PHILLIPS   |
| 5  | TANIA      | NBANGO     |
| 6  | XERXES     | ZORWICH    |
| 7  | IZI        | TORRISON   |
| 8  | YESSEMINIE | PANGAMIE   |
| 9  | PATRICK    | MCDONALD   |
| 10 | XANVIER    | ZAVVIER    |
| 11 | WAYNE      | PANINGTON  |
| 12 | CHURCHILL  | WEATHERS   |
| 13 | WINNIE     | HILLINGTON |
| 14 | PAT        | ABERCRAM   |
| 15 | JEFFERIE   | DGSTON     |

Record 1 of 15

Table: ATTE

| ID | Code |
|----|------|
| 1  | 1    |
| 2  | 2    |
| 3  | 3    |
| 4  | 4    |
| 5  | 5    |
| 6  | 6    |
| 7  | 7    |
| 8  | 8    |
| 9  | 9    |
| 10 | 10   |
| 11 | 11   |
| 12 | 12   |
| 13 | 13   |
| 14 | 14   |
| 15 | 15   |
| 16 | 16   |
| 17 | 17   |
| 18 | 18   |
| 19 | 19   |
| 20 | 20   |

Record 18 of 20

Table: COURSES

| CODE | COURSENAME              | TITLE | LASTNAME    | FIRSTNAME |
|------|-------------------------|-------|-------------|-----------|
| 1    | Population Genetics     | Prof  | Parker      | John      |
| 2    | Cytogenetics            | Prof  | Perker      | John      |
| 3    | Intro. to Polymorphism  | Dr    | Penguinsson | Penguin   |
| 4    | Simple Ergonomics       | Dr    | Stretch     | Lifton    |
| 5    | Understanding DMSs      | Mr    | Cult        | Dilly     |
| 6    | Automotive Design       | Mr    | Bentley     | William   |
| 7    | Ecology                 | Mr    | Barham      | Mike      |
| 8    | Fishing made Easy       | Dr    | Grenald     | Wans      |
| 9    | Study Skills            | Dr    | Sleep       | time      |
| 10   | Management Skills       | Dr    | Fram        | Hiram     |
| 11   | Masonry Arch Design     | Dr    | Bridge      | Bride     |
| 12   | Cyclic Design           | Prof  | Klist       | C         |
| 13   | Simple Spelling         | Mr    | Brain       | Smith     |
| 14   | Systems Analysis        | Dr    | Adams       | S.S.      |
| 15   | Intro. to Programming   | Dr    | Goythm      | Al        |
| 16   | Programming             | Dr    | Goythm      | Al        |
| 17   | Advanced Programming    | Dr    | Goythm      | Al        |
| 18   | Serious Programming     | Dr    | Penguinsson | Penguin   |
| 19   | Non-trivial Programming | Dr    | Penguinsson | Penguin   |
| 20   | Network Design          | Dr    | Derry       | Bin       |

Record 1 of 20

one piece of information. The word does not figure much in everyday usage since "data" is now commonly, if inaccurately, used for both plural and singular forms. An *atomic value* means the information contained in one field of one record. Codd uses the term "atomic" in the un-splittable, nuclear sense of an item which cannot normally be subdivided.

Rule 2 states that each entry in a table of data must be locatable using no more information than the name of the table, the field name and the value in the primary key. Thus, in Figure 2 illustrated here, you can find the name of a given course as long as you know: that the table is called COURSES, that the relevant field name is COURSENAME and that we are interested in CODE number 7.

As Codd states when expanding on this rule, "the primary key concept is an essential part". Each table in a relational database must have a primary key field and each record in that field must be a unique identifier. Examples of data which can be used as good primary keys are National Insurance numbers, car registration numbers, and the ISBN numbers of books. In most business databases, each customer order is allocated a unique number which then acts as the primary key.

In certain instances it is necessary to have two or more fields combining to provide a primary key. For example, when you need a many-to-many join between a "students and courses table", the table used to effect the join needs a primary key consisting of two fields (see Figures 1 and 2).

Some DBMSs claiming to be relational

*Neither field on its own can be used as a primary key, since both contain repeated values*

support this ability poorly. "Approach", for example, uses the dBASE file formats by default but when using them it is unable to provide multiple field primary keys. Before it will work you must purposely specify that it uses Paradox format files.

• Systematic treatment of null values

*Rule 3: Null values (distinct from either the empty character string or a string of blank characters and also distinct from either zero or any other number) are supported in fully relational DBMS for representing missing information and inapplicable information in a systematic way, independent of data type.*

Codd also states in his commentary on the rules that "it must be possible to specify 'Nulls not allowed' for each primary key column".

Null values are a very important ingredient in databases, much more so than their name implies. A null value is supposed to represent an absence of information; it's not the same as a space or a zero, a dash, or a hash or any other representation. A null means that we don't know what information should be entered into a field — it certainly does not imply that we don't care about the content of that field.

This may seem like a trivial distinction, but far from it; imagine a hospital blood bank receiving batches of un-typed blood from various sources. Each bottle would have a unique identifier which would be entered into a table called BLOODBAN along with the physical location of the

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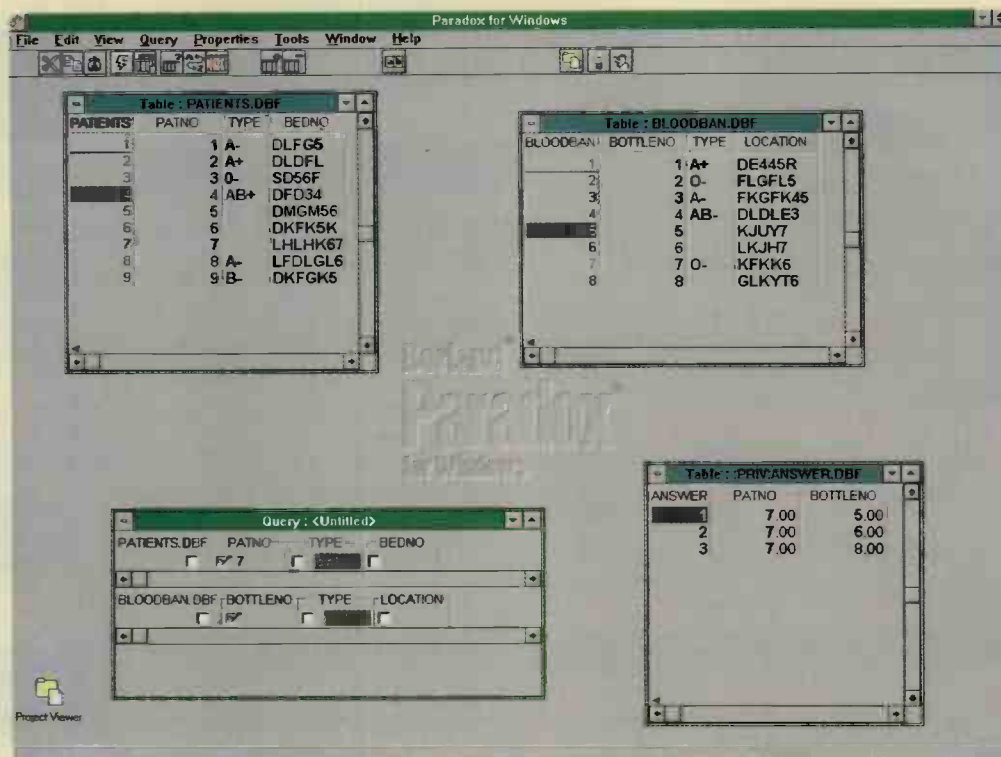
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bottle in store. There would also be a field for the TYPE which would be filled in once the blood in each bottle had been tested in the laboratory. Values such as A+ and O- would be entered as appropriate, whereas a null would mean that the laboratory report on that bottle would not yet have arrived.

This same hospital would also receive patients, each with his or her details entered into another table, called PATIENTS, along with a unique patient number. All patients would have their blood groups determined as soon as possible after admission and this too would go into the table. If the blood group field for a patient were to show a null value, then this would mean that the information was not yet available from the laboratory.

If patient number two was in need of a transfusion, you would query the database to find which bottles in the store contained blood of the correct type. If the patient was type A+, the query would find a matching entry in the BLOODBAN table (bottle 1). What about patient number seven? He may not have been typed as yet, so what should happen if we query the database to find blood for him? Certainly not what's in Figure 3. Here, you can see Paradox matching the null values in PATIENTS.TYPE and BLOODBAN.TYPE. Would you be prepared to put un-typed blood into a patient whose blood type you didn't know?

Taking another example, suppose that we are trying to match hotel guests with rooms. If a room was already occupied, then the guest number would be inserted into a field (ROOMS.GUEST ALLOCATED), otherwise it would be left as a null value. Similarly, the GUESTS table would have a field for the room number to be inserted. In this case, surely we *would* want a query to match the nulls so that we could match those guests without rooms to those rooms without guests? No. For a start, the structure of this database would be flawed because we would be storing redundant information (both tables contain information about which guest is in which room). But a serious point is that nulls are being mis-used here; a null value means that you don't *know* the state of the real-world object represented by the data in



that field. Assuming the hotel was being run correctly, we would know which rooms were unoccupied, so a null value which implies uncertainty is inappropriate. Instead of a null, we should insert an agreed value in here (perhaps a zero) to indicate an unoccupied room.

In my view, an RDBMS should never treat null values as equal. I know it is tempting because of the way in which we use the word 'Null'. Expressions like "Oh, there is a null value in that field" implies that the field actually contains something. But remember that a null is not a type of entry like a one or a zero, it is the *absence* of an entry.

In my less rigorous moments, I have been known to argue that it doesn't matter too much how a particular RDBMS treats nulls as long as that treatment is always consistent, and as long as you are sure you know the rules by which it operates. However, the bottom line is that I still have a strong preference for the ones that don't match on nulls. The take-home message is; be careful with nulls — treated with respect they can be really useful.

### Problems

**Q.** I used to keep all my data in a database called Reflex. It is all in a single file which has expanded until it is far too unwieldy (although Reflex, which was designed to run on an 8086 runs blisteringly fast on a 386). I want to import it into FoxPro but I have problems. Reflex will export in dBASE format alright but when I look at

*The blood matching problem shown in Paradox*

the file in Fox, some of the text fields are truncated. If I export it as a 1-2-3 format file, Fox will import all the data but with the dates converted to numbers. I suppose I can perform both imports and somehow combine them but surely there is a way to import it cleanly in a one go.

**A.** This appears to be a problem with Reflex, not Fox, so the answer is relevant to all modern RDBMSs that need to import data from Reflex.

I had to resurrect my old copy of Reflex from its original 5.25in disks for this one. I observed the same problems you describe. I even tried exporting as a text file without getting a clean version. However, Reflex exports in Quattro Professional (an early version of Quattro Pro) format. If you do export in this format and import into Quattro Pro for Windows, you can export it from there in dBASE IV format in which both the dates and text are complete. I was able to import a sample file into a number of modern RDBMSs, including Fox.

### PCW Contacts

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column. He's on [penguin@cix.compulink.co.uk](mailto:penguin@cix.compulink.co.uk)



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### At the headhunter's

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### In the MD's office

What do you mean "we don't know how many fault calls relate to this" - it's on the computer isn't it?

### In the PR office

Do we have any contacts in the Belgian press?

### In the research section

You mean we can't just look for everything in the database that mentions it?

### In the library

I don't suppose you've got any back-ground on [fill in pet hate]?

### In customer service

I'm sorry; do you have a part number?  
Oh...  
We're stuck then, aren't we?

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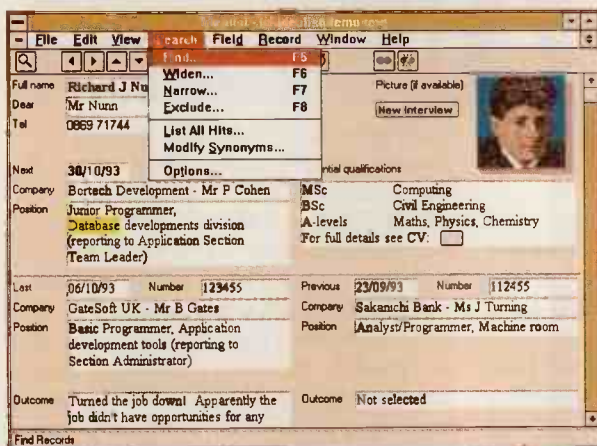
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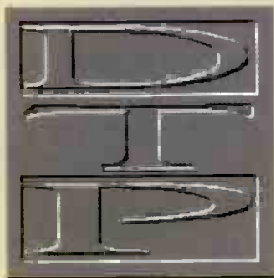
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## Tweak a letter, Miss Jones

**Take away the character attributes of text and all you're left with is a simple path. Gordon Laing has fun embellishing his fonts, and flags down a CD-ROM of extreme national importance.**

Last month we looked at the basic concepts and operations used to create and modify paths, the building blocks of vector illustration/drawing packages. This month, among other exciting developments in the graphics world, we'll look slightly deeper into path operations, predominantly concerned with modifying font outlines. We've lots more on the font front with a new type foundry, some neat dingbats and several novel means of packaging. And if you've ever been frustrated by the apparently simple but actually rather challenging task of drawing a flag, read on for a product which could save much hair tearing.

### FreeHand news

Before going any further I must mention the latest release of my favourite drawing package, FreeHand. Regular followers of this column will be well up to date on the various manoeuvres of Adobe and Aldus, and the unexpected acquisition of Altsys by Macromedia. Altsys developed FreeHand and the type-creating Fontographer, both of which are now available from Macromedia.

So, here we are starting the new year (well, it is at the time of writing) with Macromedia FreeHand 5.0 — sadly for Macintosh only, right now. FreeHand 4.0 remains the latest Windows version but hopefully we won't be waiting too long for version 5.0, promised in spring 1995 under the Macromedia flag. The good news is that for the first time, the Macintosh code is in

December 1994 are entitled to a free upgrade. Macintosh or Power Macintosh users of Illustrator, MacDraw and Canvas may cross-grade to FreeHand 5.0 for £150 and a proof of purchase — disks and manuals need not be returned to qualify.

New features include text handling



*FreeHand is now under the Macromedia banner. It's only for Mac at the moment, but Windows will follow soon*

FAT binary format, offering 680x0 and native PowerMac code on the same set of disks.

Macromedia FreeHand 5.0 costs £450 and is available from Computers Unlimited. All registered users of FreeHand may upgrade from any version for £99 until April, from which point it will cost £125. Users who bought FreeHand 4.0 from

improvements, compatibility with Illustrator plug-ins, an eyedropper to pick up colours from imported TIFFs, several special effects filters, and claimed faster performance. Particularly neat is the dragging knife tool, while the larger pasteboard and much higher levels of magnification, up to 25,600 percent (version 4.0 stopped at 800 percent) are going to be useful. Perhaps not so great, and for masochistic users only, is the option to revert to FreeHand 3.1 handling of text — aaaarrgggh! No thanks, I'll only use that facility to illustrate how much better it is now.



## Flying the Flag



*If nothing else, Flag Folio offers a fascinating opportunity to browse the national wavy things of exotic countries. Here, we've chosen a few of our favourites. For the non-cartographic among you, they are: Top Left Bhutan. Top Right Guam. Bottom Left Saudi Arabia. Bottom Right Swaziland*

### Keep the flag flying

Graphics guru and generally all-round nice bloke Paul Wootton and his associates have released one of the most useful CD-ROMs I've seen in a long time. Flag Folio with Outline Maps is the first Macintosh- and PC-compatible CD-ROM to feature a comprehensive collection of device-independent PostScript national flags and maps.

Over 215 national flags and several others (UN, Olympic etc) are offered in a variety of formats. For PC there's Adobe Illustrator 4.0, EPS, PAL (768 x 576) 24-bit PCX, and NTSC (640 x 480) 24-bit PCX. On the Mac there's Adobe Illustrator 3.0 and 5.0, Aldus/Macromedia FreeHand 3.0, PAL 24-bit PICT, and NTSC 24-bit PICT. PC Illustrator 4.0 files may be opened in CorelDraw.

EPS Flag files are set up as CMYK artwork with colour previews. The colours

have been carefully converted from the original Pantone values to the nearest possible CMYK equivalent. All text has been outlined to avoid any possible font conflicts or matching. To cut a long story short, they're ready to drop in as artwork at layout, or for further editing if required.

Over 200 outline maps are included too, but not in the bitmapped PCX and PICT formats. These outlines are ready to edit.

One question springs to mind concerning out-of-dateness. With new countries springing up left, right, and centre (usually East), a flag catalogue remains comprehensive only until the next revolution. While this is true, most of them will remain relevant, and anyone who's tried to draw a flag accurately with the right colours will understand how much of a boon such a disc can be.

At £79.99, the CD, which contains Mac and PC files along with a neat browser

facility, represents excellent value. Just check out some of the more esoteric designs, shown here. Contact Cadmium Systems for more details.

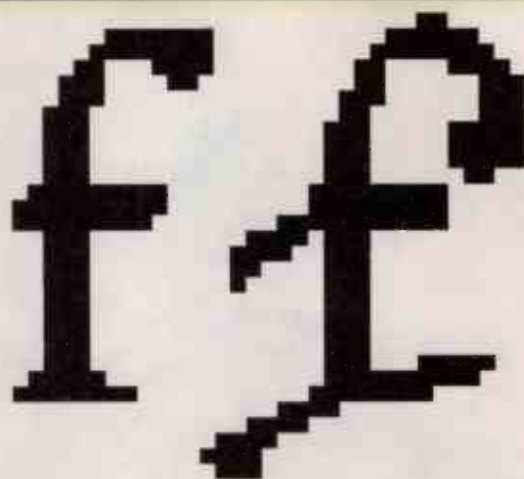
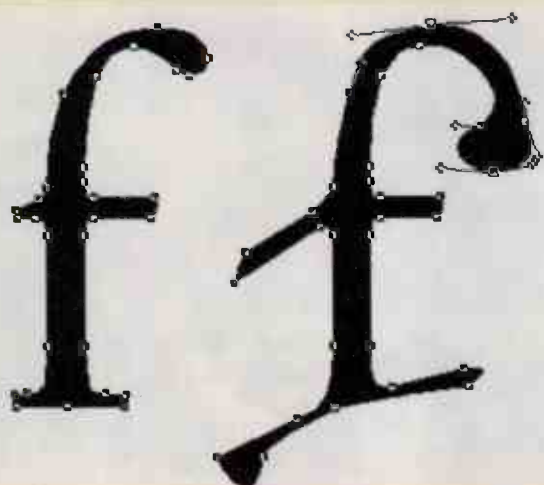
### More path operations

Just when you thought there were enough typefaces to cater for every possible situation, you find yourself not so much wanting a new face as just tweaking an existing letter. Don't reach for Fontographer: this is a simple job for an illustration package.

Remember that most fonts, be they TrueType or Type-1, owe their scalability and device independence to the simple fact that they're vector outline descriptions with character attributes. The attributes link them to specific ASCII characters and also carry spacing information, but strip this away and you're left with a simple path.

In last month's column we looked at basic path operations, handles and the

## Type-Tweaking



*Fancy tweaking a perfectly good typeface? Above are two Garamond lower-case f's. Above left shows them converted to paths and the second "f" modified as desired. Once completed they were exported as a device-independent EPS, shown above right*

like. It is perfectly possible to take text, convert it to paths and modify it in the same way you would any other path. Stretch out that tail or make it twirl about a little — it's dead easy. The only thing you have to look out for is that once converted to paths, any text permanently loses its character attributes and can no longer be edited as text, spell checked etc: it is now only a shape. On the plus side, this gets around any font-matching problems since converted text is now standalone vector descriptions.

So how do you do it? First, type your text, or specific characters you would like to modify, within a suitable drawing application; we'll look specifically at FreeHand 4.0 and CorelDraw 5.0. Before converting to paths make sure your text is correctly spelled, because once the character attributes have been removed you stand as much chance spell checking a dinosaur graphic.

When you're sure everything's okay, select the desired characters, then in FreeHand 4.0, Convert to Paths from the Type menu, or in CorelDraw 5.0, Convert to Curves from the Arrange menu. If you have more than one character you may have to select all, then ungroup them from each other.

Once they're converted, you'll see the characters as paths, with handles just dying to be dragged out. Feel free to insert additional points or merge with other paths. At first you'll be extending serifs or tails here and there, but before long you'll have added curve points and be creating extravagant swirls. Or something like that.

Once they're completed, you can

export the resulting shapes into a page layout package or keep them in an illustration. Even if you only ever stretch a character slightly, converting to paths is one of the most useful and fun things you can do in a vector drawing package.

### Just my Type

I always try to write about environmentally positive things you can do with your PC — boxouts in group tests on power-saving devices and the like. I have a constant flow

of comments at work about my large pile of aluminium cans ready for regular recycling, so I understandably feel a little guilty or hypocritical about this month's font recommendations.

One morning, a couple of weeks ago, I received a large, lilac-coloured cardboard tube and was more than surprised to find fonts contained within. It was home to none other than a collection of what are described as "incredibly illegible" fonts from the Linotype-Hell Fontshop, along

● A section of dingbats from the Face2Face tube, for your perusal





## Font of the Month

# Madzine Whip

abcdefghijklmnopqrstuvwxyz&  
ABCDEFGHIJKLMNOPQRSTUVWXYZ

with a poster and a T-shirt.

The £69 limited edition, known as Face2Face, features no less than eight faces in PC and Mac format. Linotype isn't kidding when it describes them as incredibly illegible, since several would only be useful in highly unusual circumstances. There are a couple of gems, however — MadZine Whip in particular, this month's Font of the Month, and a rather neat symbol font, selections of which are on these pages.

The Face2Face tube should still be available from the usual font suppliers; see contacts below. In the meantime, Faces has become a UK distributor for T-26, a new digital type foundry based in Chicago, Illinois. Continuing the theme of font information in an interesting package, T-26 supplied its wares in a cloth pouch aptly named T-bag.

T-26 is clearly going for the slightly esoteric designs, not dissimilar to the Font-Font collection from FontWorks. Either way, there are more than a few gems in



## ● A lilac tube of fonts from Linotype-Hell

the first catalogue I received from Faces and I look forward to featuring many of them in future issues. Also in the pipeline is a feature on dingbats and their uses. No longer exclusively arrows and snowflakes, dingbat fonts are maturing from plain bullet points to highly useful and imaginative symbols. If there are any symbol fonts you are big fans of, or you'd like to see, please get in touch at the address below.

## PCW Contacts

If you have any suggestions or requests on any aspect of Graphics & DTP, please write to me, Gordon Laing, at the usual PCW address; or, if you're suitably equipped electronically, email me as [Gordon\\_Laing@pcw.ccmil.com](mailto:Gordon_Laing@pcw.ccmil.com).

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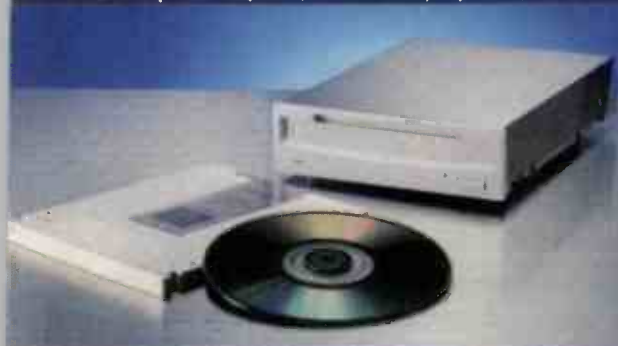
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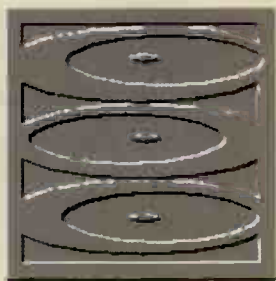
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## Reality bytes

**Karl Dunkerley gets to grips with the Elastic Reality image distortion package, investigates recent goings-on at Asymetrix, and looks at the multimedia benefits Windows 95 will bring.**

In this thrilling instalment of Hands On Multimedia, our intrepid hero finds himself caught up in the life-threatening Spatial Vortex of Vraal. As he navigates the planets of the Tralon system, his spaceship is pulled full pelt into the clutches of the Vortex from which there is no known escape. What can he do to save himself and the whole of civilisation from the evil warlords of the Thring Cartel?

Before you think I've gone bonkers, let me explain that this little scene is one I've conjured up using an excellent new package called Elastic Reality. You'll find a review of this amazing product in this month's First Impressions (page 334), but here I'm going to take you on a tour of how to use its best feature — Warping.

With a name like that, science fiction is obviously the most appropriate application, so I first of all looked through my image catalogue. Here I came up with the bitmap of a spaceship dashboard in the style of a fifties comic book. With its garish colours and outlandish design for a space racer, this was the perfect starting point and inspired the scenario above.

The idea of warping is to take an image and manipulate parts of it. For instance, you could put a smile on the lips of a grumpy man and produce an AVI file showing the change. Morphing is similar, but here the aim is to transform an image gradually and smoothly into a totally different one. Hair care adverts are full of women morphing into each other.

The ER interface and manuals leave a lot to be desired so I'll go through the steps one at a time. One word of warning, however; back up your machine beforehand if you can. The program relies on the

Win32s extensions to normal Windows and these have been known to mess up a Windows configuration. If you don't have a tape streamer, simply copy your Windows setup to another directory using the command "XCOPY C:\WINDOWS C:\WINCOPY /S/E". This makes recovery much easier and is a good idea generally. If everything goes wrong you can rename your Windows directory — use "XCOPY C:\WINCOPY C:\WINDOWS /S/E" and only your permanent swapfile should need recreating.

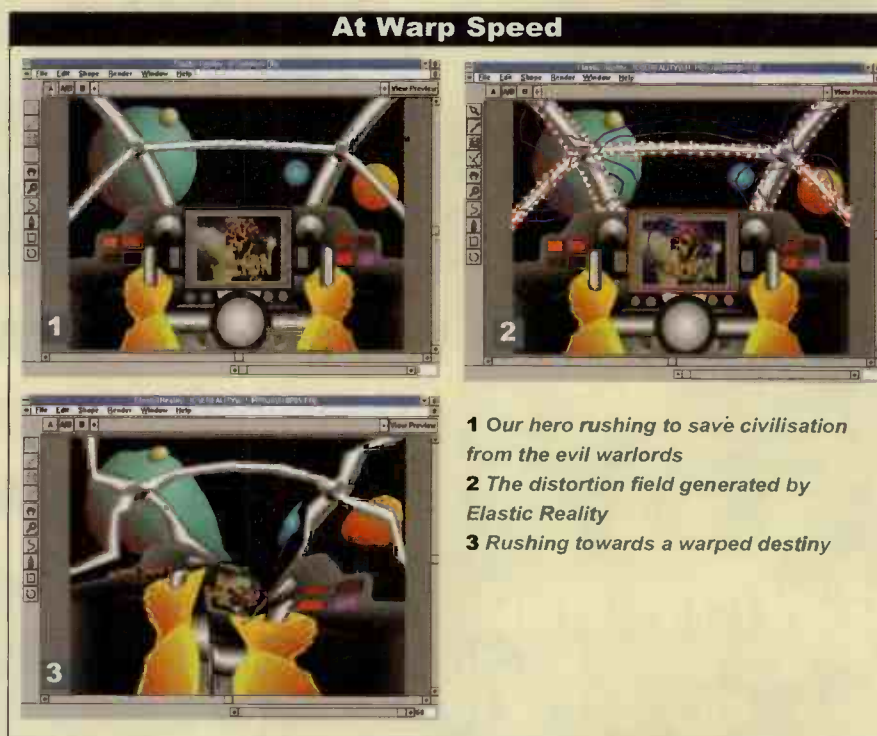
The way Elastic Reality works could be significantly improved, a fact highlighted by the method of bringing in a bitmap.

Clicking the usual File and New brings up the Sequence Editor, a simplified video editor. You next need to choose Image and Insert to bring up the file list to find the desired image. Once loaded onto the A-Roll, you must click File and Accept. The Editor disappears and you can start work on the image — a messy process. Maximise the window and use the magnifying glass tool to fill it with the image. This makes fine, detailed work easier.

The effect I want to create is a visual distortion from the space racer's cockpit window. The easiest way to do this is to distort the struts of the window. When these distort, so will the planets and moons in the background. Our hero will find himself in the vortex with his capsule collapsing around him.

With Elastic Reality there are three ways to outline the area to distort. Which you choose depends upon how smooth or jagged an edge you want. The Pen tool can be used as either a "join-the-dots" utility or a Bézier curve drawer. An alternative is the freehand tool which allows you to draw around an object continuously until both ends are joined. Working with a mouse, though, is hardly ideal. Elastic Reality will smooth the edges out to whatever degree you choose. If the shape you have drawn is not perfect you can use the Reshape tool to add in extra points and move them about until the shape is correct. Zoom is really helpful.

Some trial-and-error helps you determine the best one for the effect you want. In this case, I traced the line of the cockpit



- 1 Our hero rushing to save civilisation from the evil warlords
- 2 The distortion field generated by Elastic Reality
- 3 Rushing towards a warped destiny



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struts using the Pen Tool clicking along the edges. It is better to err towards clicking on the background rather than on the strut. Given that it's a black starlit sky, any unwanted distortion is unlikely to show up much whereas the relatively bright strut would. Tracing the outline required a great number of points but the process is still relatively quick and painless.

Once all this is done, you have to create and modify a copy of the outline in the B-roll. Click the B-roll button and use the normal Copy and Paste functions in the Edit menu. After highlighting the copy outline using the Reshape tool, each point should be moved into its final warped resting position. This again takes time and care. I decided to bend the side spokes in a circular fashion to suggest a vortex and bent the central spoke upwards. This is a good point to do a Save As so that your work is not lost if a mistake is made.

### See the join

The next step is to tell Elastic Reality which of the two shapes you want to distort into the other. After clicking the A/B-roll icon, use the Pointer tool to click on the original undistorted image and then depress the Shift key and click the distorted image. With the two images highlighted, you need the Join option from the Shape menu.

To see if the warp has worked, move the Frame scroll bar to the far right end (30 frames is the default length of the warp though this can be changed). From the Render menu, the Render Preview option will only perform the warp on the current frame. How long this takes depends on the complexity of the warp and the resources such as memory and processor speed available on your machine. Once rendered, you can quickly switch between the start and finish images using the View Preview button. To get a faster but less accurate look at the effect, you can use the Wireframe Preview from the Window menu. This is very crude and does not show the effect on surrounding objects.

When you're happy with the final result, you can go back and use the Render Full Effect option to compile the entire warp into a Video for Windows movie in AVI format. This can then be seen using the Play Movie option. The default screen size is 320 x 240 pixels. Anything larger and you might run out of memory. Even with 12Mb RAM, I did.

Although I was reasonably happy with the result so far, it lacked a certain something so I decided to twist the display panel in the centre. Switching between the vari-

ous rolls as appropriate I used the Square Tool to outline the panel and then the free-hand tool to draw a roughly shaped circle inside. Joining these two images, I ran the Render Full Effect option again. The effect was an even more dramatic twisting as if going down the plug-hole of a vortex. Even the pilot's hands twist with the force. Such a good effect was wasted on a 1.2-second clip so I increased the length to 60 frames in the final rendering. This could be lengthened even further to give a slow-motion effect of sinking into the void.

The example I've shown you is relatively simple in principle, but just imagine how many hours it would take a professional illustrator by hand. Creating the beginning and end frames, filling in with key frames and drafting the individual frames to create a smooth effect would take ages.

The source image doesn't have to be a bitmap: a number of formats from JPEG to Silicon Graphics sourced images and high-quality video clips are accepted. Elastic Reality also includes the facilities to create morphs, animations with motion and transparency control, and composite images. With a composite you can cut out part of an image and paste it onto a different background. Following the sci-fi theme, you could take a shot of the Space Shuttle and paste it moving across the face of Saturn or Jupiter.

Bundled with Elastic Reality is the TransJammer package which acts as the video editor and special effects generator. It includes some excellent transitions, including Blob, Bounce, Cube, Diagonal Flip, Flex, Shard, Stirfly and Zoom Switch. Anyone nostalgic for James Bond opening credits can call up a woman to swim transparently between one scene and another. TransJammer lacks the sophistication of Adobe Premiere but the two can be used together to create top-notch multimedia video presentations.

### Windows 95

First the good news. I have seen the future of multimedia on the PC, and it looks pretty good. Now the bad. Consumers are going to have to wait some time for the new tools that Win95 will make possible in shrink-wrapped form.

At the Windows 95 Multimedia Reviewers' Workshop held on the company's campus at Redmond, near Seattle, 150 journalists were shown key elements of the new multimedia technologies. Not all these tools will be available in the consumer package or at the time of launch, but many are already being used

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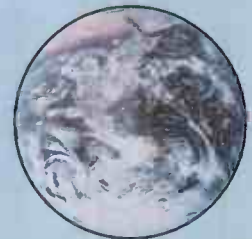
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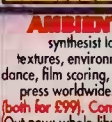
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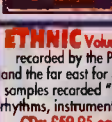
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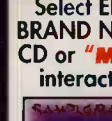
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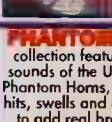


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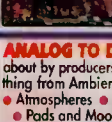
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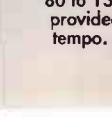
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by multimedia production companies to create new titles.

For video, Win95 promises much better compression and decompression with improved lip-synching and support for MPEG. In the light of repeated failures to create CDs capable of handling both music and multimedia properly, Microsoft will be supporting a new Enhanced CD format which puts audio tracks down on the first session and data tracks on later ones. AutoPlay will recognise immediately what type of disk is in the player. Audio improvements will include Plug 'n' Play MIDI with multiple ports, improved wave audio compression, surround sound and 3D playback. Developers will be able to embed MIDI in AVI files.

The DIBEngine promises much better graphics handling and the Display Control Interface will allow Windows to take full advantage of hardware accelerated graphics cards. This is aimed at promoting high-quality graphics in all sectors of the market, from high-end users to games producers, plus it will improve video playback dramatically on compatible cards. OpenGL is a 3D system developed by Silicon Graphics for CAD, imaging and multimedia and was used in the creation of Terminator II and Jurassic Park, but will ship after Win95. The demonstration of Spock's head spinning was particularly impressive.

WinToon will sit on top of WinG for games to allow rapid animation and give blitting technology a run for its money. Surround Video allows developers to take a 360° picture of a scene and embed hyperlinked objects. The example shown was of a town centre where buildings could be clicked on and accessed.

Back on the games front, AutoPlay will hold great advantages for developers and users alike. Instead of producing titles for the lowest common denominator of equipment, developers will be able to produce titles for the best equipment and Win95 will intelligently adjust its output for lesser kit. If you upgrade from a basic SoundBlaster to an AWE32, the playback will adjust automatically to give better sound quality. Even better, one of the main aims of all these developments is the "Zero Footprint" application. Once you've finished, it removes all trace of itself from memory.

The award for the best live demonstration went to the man from SoftImage (a company bought by Microsoft last July). He demonstrated the kind of advanced authoring tools the company hopes to bring to the PC at a fraction of the cost of a Silicon Graphics workstation. The speed

he worked at had even the most hardened hack gasping and applauding. My only question afterwards was, how soon could I get my hands on one?

All the tools on show should eventually work their way into consumer development packages, but that's not likely to be when Win95 ships. Multimedia has made great strides over the last two years; the next two could be a giant leap.

### New from Asymetrix

While at Redmond, I called on Asymetrix in Bellevue who have undergone a major restructuring with around a third of staff laid off. The aim has been to refocus the company on its core product lines; as a result the screensaver/entertainments division has gone, in favour of ToolBook and a raft of new products. The only bad news for consumer-level multimedia enthusiasts is that Asymetrix may sell off Asymedia, which I featured last month. This is despite having version 2.0 ready to roll.

Asymetrix were happy to show me their latest developments. These include 3D-F/X, a standalone shrink-wrapped version of Digital Video Producer 1.0, and a CBT-based version of Multimedia ToolBook. DVP has been greatly enhanced compared to the version shipped with ToolBook and capture cards. The CBT version of MMTB should make the development of courseware and training packages much easier. It uses a Wizard-like system to take the producer through the necessary stages. Educationalists take note.

3D-F/X is stunning, bringing 3D animation within the reach of the consumer and with an interface that is easily understood. It takes advantage of commercially available libraries of 3D objects from mainstream CAD packages such as Autodesk 3D Studio, to reduce costs and development time. I have the shrink-wrapped version and shall bring you a peek into its workings as soon as possible. At a price quite likely to be less than £150, it should be a good investment.

There was talk of bundling DVP and 3D-F/X, and it occurred to me that these two together, with Asymedia 2.0 at around £199-£249, would represent tremendous multimedia value.

### PCW Contacts

Karl Dunkerley can be contacted at the usual PCW address or by email at [Karl\\_Dunkerley@pcw.ccmail.compuserve.com](mailto:Karl_Dunkerley@pcw.ccmail.compuserve.com)

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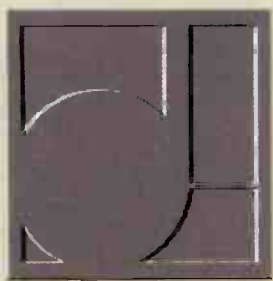
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## Studio session

**After five frustrating years of Cubase on the Atari, Steven Helstrip turned to the PC. He turned back to the ST when, in the studio, the PC refused to dance to his tune. Plus, what to look for when buying digital audio applications.**

Whether or not Cubase is the best sequencing package around, it is the industry standard and no discerning musician should be without it. Surprisingly, though, 31 percent of users are still making do with their Atari versions. Five years of struggling with a 12in mono screen and waiting for redraws was enough for me and had me considering an alternative platform. As I was already familiar with Windows, and Macs were a tad expensive at the time, buying a PC was the obvious choice. The transition to Windows was bliss, yet I frequently find myself having to work with the Atari.

### Atari in the groove

When I'm not writing for *PCW* I spend much of my time working alongside songwriters and producers. Most pre-production facilities have yet to catch up with today's technologies and still use old and battered Atari for sequencing. Occasionally I take along the PC with all its gadgets and alloy wheels, but more often than not resort to using the coffee-stained Atari in the corner.

The story goes something like this: arrive at the studio and spend 20 minutes or so setting up the PC. A further half hour is then spent routing MIDI cables and assigning instruments to MIDI out ports and channels. All goes well until this point.

The nightmare begins when it comes to synchronising to external SMPTE generators. Although my system works a treat at home, it tends to go out of sync three minutes into a song elsewhere. By the time I've solved the problem, I'm wondering where the afternoon has disappeared to.

Ironically, the resident £200 Atari ST always copes well. It would seem that it's more reliable as it was built with MIDI in mind, whereas the PC requires additional hardware and software drivers which mean it can be temperamental. So don't throw that Atari away just yet.

### News roundup

Big news this month for Windows users is that Microsoft has plans to integrate Opcode's Open Music System (OMS) into Windows 95. So far, Opcode hasn't strayed too far out of the Mac arena and has only released Vision for the PC.

OMS enhances the MIDI environment by allowing applications to share information based on a central document. The document contains information about the instruments in your MIDI setup: the ports and channels they are set to receive on and their multi-timbral capability. When the document is complete, you can address each instrument by name and forget technical issues like "do I have a spare part on my JD800?" and "what channel is my effects unit set to receive on?".

OMS makes use of multi-client drivers which means you can route MIDI data from one application to another for

*Circle Elements contains over 1,000 samples at 44.1kHz and 22kHz*

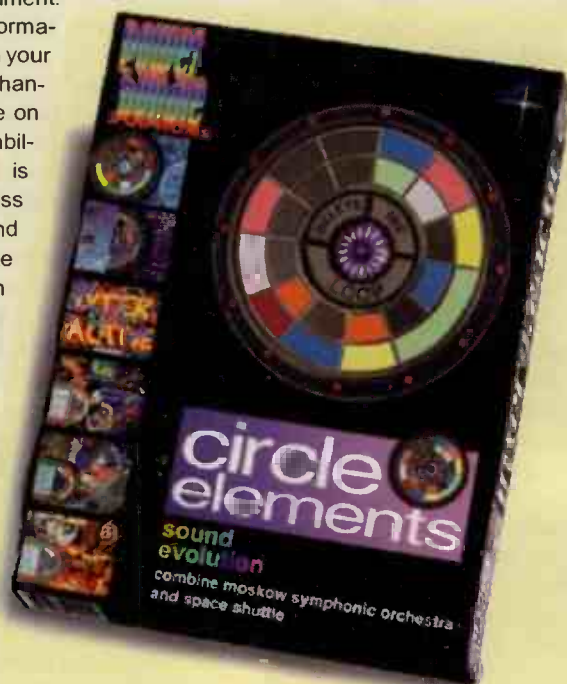
synchronising and sharing sysex data. As well as OMS, Opcode will be releasing several applications for Windows. They are likely to include reworkings of Vision and Galaxy (Opcode's synth editor/librarian). Studio 4, an 8 in/out MIDI interface, will also be available later in the year.

● Time + Space has made the move to supply more samples in PC Wave format and has released the second Zero-G Datafile PC CD-ROM. Like the first, it contains over 1,000 samples aimed specifically at dance producers and DJs. Each sample has been recorded at 44.1kHz and can be downloaded to RAM on sound cards such as the Tropez. We'll be taking a look at the latest sampling CDs in this column. In most cases, it will be possible to put a few tasters on our cover CD.

Time + Space has also released Circle Elements, a Windows and Mac-based application that allows you to piece together compositions with little or no knowledge of music. The package comes in two flavours: Planet Earth and Inter-galactic. Each comes with over 500Mb of samples including drum loops, guitar riffs and sound effects. Check out next month's First Impressions for the full lowdown.

### Guide for buyers: digital audio applications

If you own a sound card, chances are you have one or two applications for recording and manipulating digital audio. The most common is Creative's WaveStudio which is bundled with all the company's 16-bit cards. It provides facilities for moving sections of audio around, deleting regions and optimising levels, but it's not ideal if you





## Zero-G Datafile 1



The Zero-G Datafile 1 is the first in a series of three dance-oriented PC CD-ROMs from Time + Space. It features over a thousand samples stored in wave format and includes breakbeats, vocal hooks, single percussion and instrument samples that no dance producer should be without.

The first 60 or so tracks are a combination of live and programmed breakbeats and percussion loops taken from various sources. Like most loop collections there's something for everyone, from live soul grooves to acid synth and hardcore loops. All the samples are recorded in mono and are either one or two bars in length, but finding the right

sample can be time-consuming as the documentation is not particularly forthcoming on style and tempo.

As well as samples taken from Roland's 909 and 808 drum machines there are 76 snare and 44 bass drum samples. Again, these are a mixed bag of live and electronic sounds. Many of the vocal ad-libs will impress your friends but aren't much use for commercial recordings as they've all been heard before. That said, many are inspiring and in the pre-production stage they are great for getting ideas down.

All this for 20 quid is money well spent. Plus, there are several hundred more samples including various effects, atmospheric synth pads and speeches from Lost in Space. To go through them all in any detail would take me another two months, so you'd better check them out yourself. Price: £19.95. (There are 20 samples on this month's CD-ROM in .WAV format.)

spend a lot of time editing audio.

As well as the number of features a package has, the speed at which it can manipulate your audio should come high on your list of priorities. WaveStudio is fine for editing samples that are no larger than, say, 1Mb, but when it comes to editing a 40Mb 16-bit stereo file it's as efficient as a bike with square wheels.

Unsurprisingly, applications that do the job in a respectable time don't come cheap and often cost more than the price of your sound card. FastEddie is one of the better packages for editing two-track files, while Samplitude and Software Audio

Workshop (SAW) are specifically designed for 4-, 6- or 8-track work.

Over the coming months we'll be looking at each package more closely, and at ways of using them to the full. In the meantime, here are a few pointers to consider:

Some of the high-end packages — SAW, for example — need at least 16Mb of RAM to run efficiently, and because their main use is in multi-track work you're also going to need a respectably-sized hard disk. As a rule of thumb, one minute of digital audio sampled at 44.1kHz 16-bit stereo requires 10.5Mb hard disk space. Multiply that by four to give you the eight

tracks, and then by 3.5 for an average length song, and that's around 150Mb.

When playing back eight tracks of audio simultaneously, it's necessary to have a fast hard drive. A data transfer rate of 800 kilobytes per second (kb/s) should suffice, although faster drives will result in fewer glitches. When working with D2D applications it's a good idea to defragment your hard drive at regular intervals as this will increase performance further still.

If you're planning to synchronise your audio to an external source such as a sequencer or video tape, it should have support for SMPTE or MTC. FastEddie does not support either, and SAW requires a MIDI interface other than the one used by your sequencer. Although several packages will allow you to play back several tracks simultaneously, not all will play and record at the same time. This may also require additional hardware.

## PCW Contacts

Each month this column will have news of the latest developments, as well as practical advice for getting the most out of music technology. If you have an audio program or utility, any hints or tips, or a topic you would like to see covered, write to our usual address or email [steve\\_helstrip@pcw.ccmil.com](mailto:steve_helstrip@pcw.ccmil.com). [compuserve.com](http://compuserve.com)

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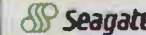


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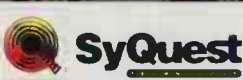
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## Now C here...

**Compiled Visual Basic? Not quite, but Progress is talking about the next best thing. Tim Anderson enjoys some speculation, and investigates the intricacies of ODBC.**

**V**isual Basic is under pressure from faster rivals, notably Borland's Delphi compiler. Requests for a compiled VB are as old as the language itself. Microsoft has steadfastly refused to comply, arguing that VB is fast enough and speed-critical VB components can be moved to a compiled DLL written in C. It's a weak argument. Why should VB programmers need to learn C or C++?

Further, some of VB's speed problems are in its interface handling, and they are not easily moved to a DLL. Among VB developers at the VBITS conference earlier this year, performance issues were the number one source of discontent. A possible (and I emphasise "possible") solution is emerging in the shape of a VB porting tool which converts VB code into C++, using the Microsoft Foundation Classes. The tool is being developed by Progress, now part of Crescent Software. Don't rush to place your orders, as nothing is likely to appear before the autumn. But I did chat with Crescent about what is planned.

The idea of converting VB code to C++ is quite plausible, given that most VB objects correspond closely to MFC classes. Most developers are wary of such tools, finding that they often don't work with code of more than trivial complexity. Even when they do work, the resulting code tends to be poor compared with something written specifically in the target language. The Crescent tool may still be useful, since even poor compiled C++ code is likely to be faster and more compact than good Visual Basic code. I was surprised to discover that Crescent does

not intend you to port your VB application once, and then edit and maintain it as a C++ application. Rather, it envisages an automated convert-and-compile process, triggered by an option added to VB's menu. You will continue to develop in VB, and the Crescent porting tool will appear as a slower version of the current "Make EXE file..." option. For those who do want to abandon VB altogether, the tool will preserve function and variable names to give you some hope of finding your way in the new C++ code.

Too good to be true? Probably, but a nice idea nonetheless. If it works it will be the next best thing to a VB compiler, and Microsoft is said to be working closely with Crescent, presumably hoping to pacify those demanding a Delphi-like compilation option. The tool is for a future version of Visual Basic, not VB 3.0, and it will support not VBX controls but the new OCX standard. We'll report on this venture as soon as some code appears.

### Reporting for duty

Pity the vendors of reporting products. All users want is to report quickly and easily on their data, but to perform such a feat the reporting software has to run very fast under the surface. A report is simply a nicely formatted query, so the report writer has to be as capable with queries as a full database management system. It either needs its own database engine or to connect to somebody else's, with all the version control perils that implies. It needs to report seamlessly on all kinds of data format, local or server-based. It should

attempt to make tricky concepts like joins and groups easy to use and understand. In other words, the humble report writer has a difficult task made all but impossible by a constantly moving target, as every standard shifts and changes.

In theory, ODBC should be the knight in shining armour. By presenting a uniform API, ODBC makes it easy to program database applications without knowing the details of how the database engine or server actually works. It does make enormous sense: one smart icon in the Windows control panel to administer all the data sources you need. The snag is that ODBC presents a host of new problems. The manager DLLs do not stay the same but are regularly updated by Microsoft; each individual driver has its own specification, and the "uniform API" is not as uniform as it should be. And because ODBC is a shared Windows component, it is very likely that the ODBC installation you develop with is not precisely the same on the target PC.

I write with feeling, having struggled to work with ReportSmith 2.5, Borland's report writer. ReportSmith relies on ODBC for local data access, although the latest version can use IDAPI (Borland's equivalent to JET) as an alternative to dBase or Paradox data. Somehow, my ODBC set-up had become unacceptable to ReportSmith and I got nothing but cryptic ODBC error messages, despite reinstalling ReportSmith from scratch. Since the ODBC installation had recently been modified by Clarion for Windows, CA's Visual Objects, Crystal Reports, FoxPro 3.0 and



the new Microsoft driver pack, I was not greatly surprised. But users will blame you when your application doesn't work, not the new software they have just installed. And to fix it you have the tricky job of trying to duplicate their setup or making a site visit. Not always easy, and annoying if your code is not to blame.

I finally got ReportSmith working as its makers intended, but still had ODBC problems. Here's an extract from the ReportSmith readme file:

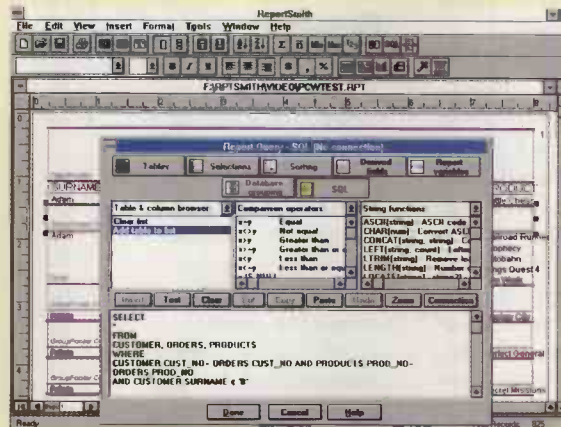
"With the advent of Microsoft's ODBC standard for accessing databases, it is now possible for the end-user to install new ODBC drivers of which the ReportSmith product has no built-in knowledge. While the ODBC interface allows ReportSmith to query the driver to find out some of this information, much of it is not available through the ODBC interface.

"When ReportSmith is directed to use a database driver for which it has no built-in knowledge, it makes the best guesses it can with regard to the capabilities and behaviours of the database by utilising what information is available through the standard ODBC interface. Depending upon how closely the database follows certain ODBC conventions and standards, this may or may not be acceptable."

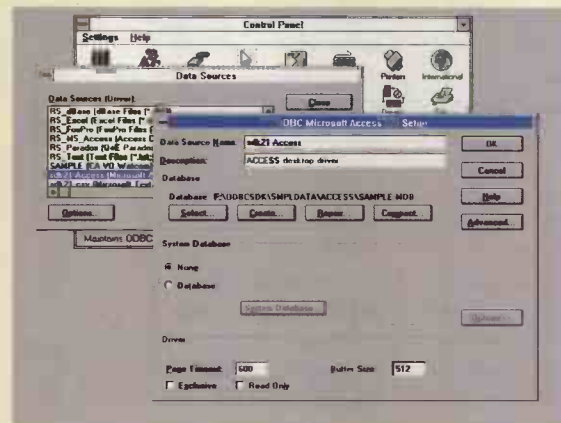
Now, ReportSmith has two methods for building the query underlying a report. One is a nice point-and-click interface which constructs an SQL query for you. Used with any ODBC driver other than those supplied, this seems to result in those familiar cryptic ODBC error messages. To overcome this you can write your own SQL query; this is called SQL Text mode.

This works well, the problem being that many of the ease of use features are thereby disabled. ODBC is a great idea, but in the case of ReportSmith it seems to bring as many problems as it solves. Last you think ReportSmith is hopelessly ODBC-bound, I should note that it has its own native drivers for server databases, which alongside IDAPI give you some other options. I mention it in this column since ReportSmith can easily be used from Visual Basic and offers an alternative to Crystal Reports. The mechanism involves calling ReportSmith runtime via DDE; it would be nice if Borland would develop a VBX to simplify the process, but it is really not complex. ODBC hassles aside, I liked ReportSmith's clean interface although its commitment to showing live data at design time seems to involve

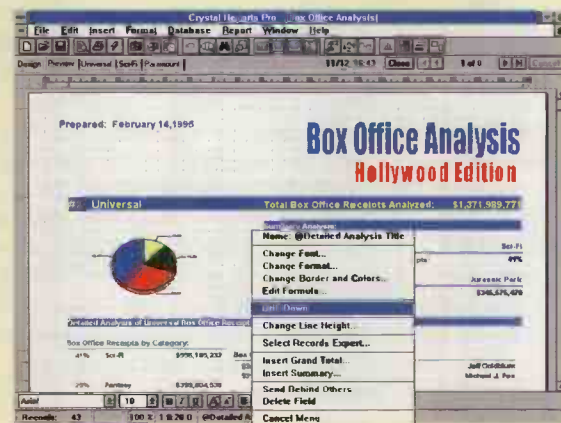
## Reporting Back



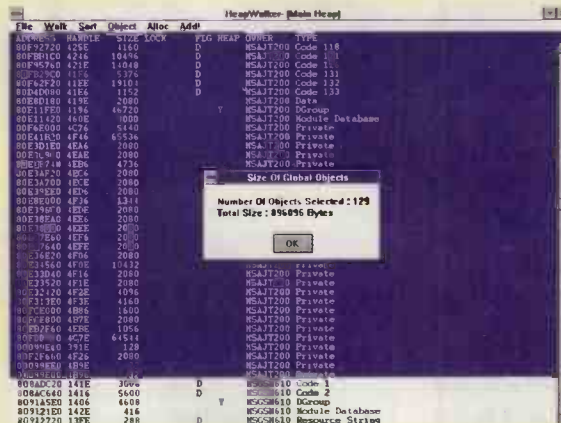
● Borland's ReportSmith leaves you to write your own SQL if it doesn't get on with your chosen ODBC driver



● Blessing or curse? The ODBC standard is widely used, but brings with it many version control and configuration problems



● Crystal Reports 4.0 offers a neat drill-down facility. This is the full user interface; by contrast, the run-time print window is dire



● The truth about JET: even a simple ODBC query uses over 800kb for the main JET DLL alone



frequent pauses while it refreshes the underlying query. It comes in two versions: a budget desktop edition and an SQL version with drivers for a wide range of SQL servers.

You may be better off sticking with Crystal Reports, now at version 4.0. It's a large application, its main print engine now nearly 1.4Mb (ReportSmith is less than half the size). Crystal, now owned by Seagate, has concentrated on end-user features to simplify report creation. File New now offers eight different "experts" which step you through report types, including listings, crosstab reports, mailing labels and Top N reports. There is a graph/chart expert and a Private Tutor, the equivalent of Microsoft's Cue Card assistance.

Crystal's database access can use the JET database engine, either version 1.1 or 2.0. There is a native driver for dBase files, and the Paradox Engine is brought into play for Paradox data. The Professional version supports ODBC. Overall, Crystal is vulnerable to the same kind of configuration problems as those which afflict ReportSmith, although it seems a little less sensitive. During testing something went wrong with Paradox data access, so that the supplied Paradox samples reported: "not a known data type". New in version 4.0 is a drill-down feature, which enables you to present summary data with a right-click option to drill down to the underlying details, which are nicely presented on another tab in the Crystal window.

Version 4.0 has the look of a product which was waiting for VB 4.0 and Windows 95, but it has come out anyway due to Microsoft's delayed shipping of both products. A 16-bit OCX control is supplied, ready and waiting for applications which support this new OLE standard. The bundled Truegrid control, however, is still in VBX-only form.

But is version 4.0 worth the upgrade? From the point of view of VB developers, I feel Crystal is going in the wrong direction. Crystal 4.0 is huge, memory and resource hungry, and full of end-user features; whereas VB developers need something small, efficient, and tailored to their needs. The Crystal runtime window is a poor thing, and for all its efforts on end-user features, Crystal has not got round even to putting tooltips on the obscure runtime window icons — not every user will guess that a suitcase means "Export". Perhaps Crystal deliberately downplays its runtime module to promote sales of the full version. If so, it has left a gap in the market for a report module more suited to VB development.

## Universal JET

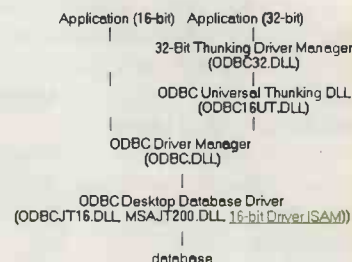
### Microsoft's ODBC 2.0

Desktop Driver pack is JET in disguise, since it uses the same runtime database DLLs as Access and Visual Basic for local data files (see diagram). The driver pack also introduces a 32-bit version of the JET DLL, which presumably heralds the arrival of a 32-bit Access in due course. Linking the ODBC drivers with JET does make sense, since Microsoft no longer needs to maintain a separate range of ISAM drivers. It means that JET is easily accessible from any Windows application. The implication is that JET may become the standard Windows data access mechanism for Windows applications, providing database functionality that is thought of as part of the operating system. Version 2.0 of the desktop drivers brings other benefits, such as transaction support for Access 2.0 MDB databases. Transactions are still not available in the other desktop drivers, for dBase, FoxPro, Btrieve and Paradox.

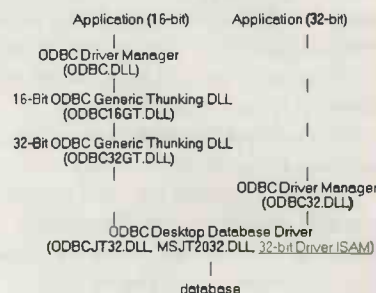
Once you have a working configuration, it is now very easy to get at local data using ODBC. That leaves one problem: the substantial memory and resource requirements which JET imposes. For example, I have a wee macro in Word which uses ODBC to fetch addresses from a DBF. This uses one of the new desktop drivers. With the macro running, I used Heapwalk to check the memory usage as follows:

|                 |        |
|-----------------|--------|
| MSJT200.DLL:    | 896096 |
| Other JET DLLs: | 15776  |
| ODBC DLLs:      | 346848 |

The application/driver architecture for Win16/Win32s applications is:



The application/driver architecture for Win32 applications is:



*The ODBC Desktop Driver pack is JET in disguise, as shown by these two explanatory figures. Note the arrival of a 32-bit version of the main JET DLL*

XBS200.DLL: 242400

Total it up, and it's 1,501,120 bytes used to find an address in a local table. The SIMM manufacturers must be delighted. To be fair, JET is a capable database engine of great flexibility. But there is a high price to pay for its easy data access.

### And finally...

For a long time Visual Basic was on its own as a reliable, visual tool for rapid application development in Windows. This is no longer the case, and it seems appropriate that this Hands On column should reflect the diversity of new tools. While VB will still get the lion's share, I intend to cover Borland's Delphi in this column and to take a sideways look at other tools such as Clarion for Windows or CA's Visual

Objects. I would be interested to hear of your experiences with any of these new tools. I also intend to look at help authoring tools, so please send any relevant comments to me via email or to PCW.

### PCW Contacts

Tim Anderson can be contacted via PCW at the usual address or  
[freer@cix.compulink.co.uk](mailto:freer@cix.compulink.co.uk) or  
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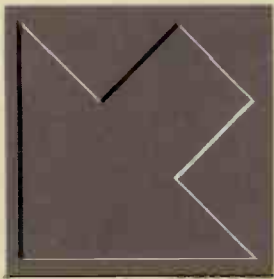
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# Working with the Windows registry

**An integral part of Windows NT, the “registry” can also be found in Windows 3.1. Mike Liardet shows how to manipulate the information contained within it, using a simple registry access program designed in Visual Basic.**

**Y**ou won't be involved with Microsoft's Windows NT for very long before you come face to face with "the registry", or registration database as it is sometimes called. This is a Microsoft proprietary format file that contains practically all the configuration information needed to drive the NT system. It holds details of the operating system itself, the users that work on it (remember that NT is multi-user), the PC's hardware configuration and all the loaded applications as well. Instead of being spread in multiple files over the disk, as would be the case with Windows 3.1, all this information is located centrally in the one file — the registry.

On close examination it can be seen that virtually all the setup information for

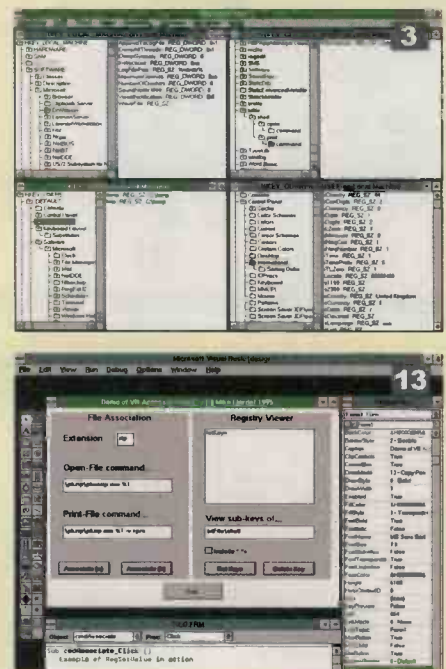
Windows NT ends up in the registry and it effectively replaces `autoexec.bat`, `config.sys`, INI files and all the other control files with which Windows 3.1 programmers will be only too familiar. For example, the Control Panel settings are held there along with the machine's memory configuration, as well as the preferred user settings for the various applications.

Bearing in mind the central role of the NT registry it should come as no surprise to find that Windows 3.1 (and Windows for Workgroups) also has one, although it is not widely used and it is barely mentioned in the standard documentation. In general 3.1 still makes extensive use of INI files etc, but it does access a cut-down version of the registry from one or two of its own

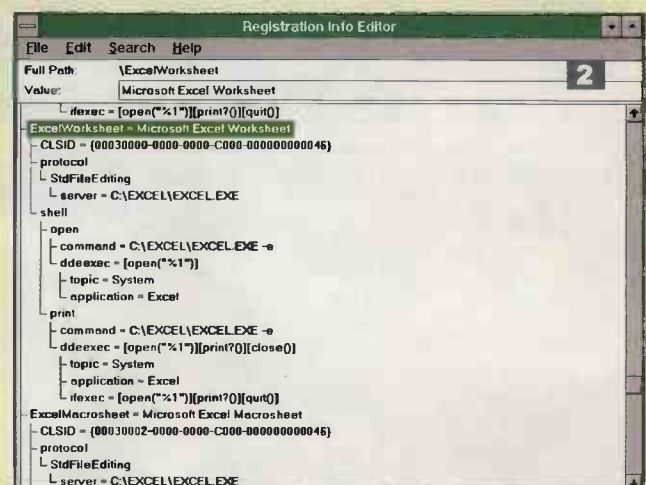
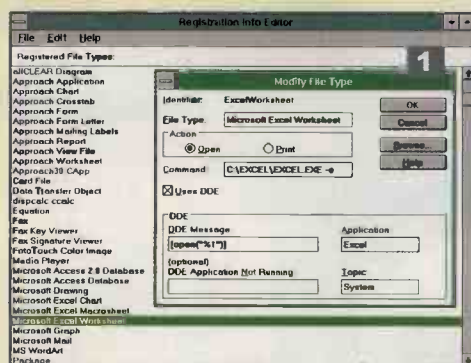
program modules.

Although the 3.1 registry is rather underplayed, there is a registry editor installed as standard on all Windows 3.1 systems which can be used to manipulate the registry database. Don't look for a program icon for it: just run "regedit" from Program Manager.

Fig 1 shows the outcome from running "regedit". The Windows 3.1 registry maintains information on "file associations" for



**Fig 1 Basic access to the registry using regedit from Windows 3.1** **Fig 2 More advanced access to the registry, using regedit with the lv command line option** **Fig 3 The Windows NT registry, accessed via the regedt32 command, overlaying a vast amount of Visual Basic regis-**





File Manager, along with the commands that can be used for Dynamic Data Exchange and Object Linking and Embedding between applications. An alternative

### Fig 5 The RegCreateKey function

RegCreateKey

#### VB Declaration

Declare Function RegCreateKey& Lib "SHELL.DLL" (ByVal hkey&, ByVal lpszSubKey\$, lphkResult&)

#### Description

Given the specification of a registry key to be created, creates it and returns its handle. If the specified key does not already exist in the registration database then RegCreateKey creates it and then opens it. If the key already exists then RegCreateKey merely opens it.

To create keys that are subordinate to the top level of the registry specify HKEY\_CLASSES\_ROOT for the hkey parameter. This function can also be used to create several keys at once. For example, to create a subkey four levels deep set the lpszSubKey parameter to (say): "subkey1\subkey2\subkey3\subkey4". The handle for subkey4 will be returned by this call, but the three preceding subkeys are also created (if necessary) as a side effect.

#### Parameters

hkey& (long) - caller supplies a handle to an open key, or else one of the HKEY\_CLASSES constants, such as HKEY\_CLASSES\_ROOT (see figure 11). The key opened or created by RegCreateKey is a subkey of the key identified by the hkey parameter.

lpszSubKey\$ (string) - caller supplies a string specifying the subkey to open or create. The "\" character can be used as a separator in this string in order to specify a hierarchy of keys.

lphkResult& (long) - returns to caller the handle of the key that is opened or created.

#### Return Value

The return value is ERROR\_SUCCESS if the function is successful. Otherwise, an error value is given (see Fig 11)

### Fig 4 The RegCloseKey function

RegCloseKey

#### VB Declaration

Declare Function RegCloseKey& Lib "SHELL.DLL" (ByVal hkey&)

#### Description

RegCloseKey closes the supplied registry key, releasing the key's handle. When all keys are closed the registration database can be updated.

Note that RegCloseKey can only be called if a key has been opened by either RegOpenKey or RegCreateKey. The handle for a given key should not be used after it has been closed, because it may no longer be valid. It is good programming practice to ensure that key handles are not left open any longer than necessary.

#### Parameters

hkey& (long) - caller supplies the handle of a key to be closed - this is normally a handle that has previously been returned by a call to RegOpenKey or RegCreateKey.

#### Return Value

The return value is ERROR\_SUCCESS if the function is successful. Otherwise, an error value is given (see Fig 11)

### Fig 11 Declarations of constants used by the registry functions

#### Return codes from Registration functions -

Many programs simply check for ERROR\_SUCCESS.

```
ERROR_SUCCESS = 0&
ERROR_BADDB = 1&
ERROR_BADKEY = 2&
ERROR_CANTOPEN = 3&
ERROR_CANTREAD = 4&
ERROR_CANTWRITE = 5&
ERROR_OUTOFMEMORY = 6&
ERROR_INVALID_PARAMETER = 7&
ERROR_ACCESS_DENIED = 8&
```

#### Root Registry for 3.1

Note that 3.1's root is only a sub-branch in NT

```
HKEY_CLASSES_ROOT = 1&
Various Roots in NT
```

```
HKEY_CLASSES_ROOT = &H80000000
HKEY_CURRENT_USER = &H80000001
HKEY_LOCAL_MACHINE = &H80000002
HKEY_USERS = &H80000003
HKEY_PERFORMANCE_DATA = &H80000004
HKEY_PERFORMANCE_TEXT = &H80000005
HKEY_PERFORMANCE_NLSTEXT = &H80000006
```

#### Registry entry Types

Only use REG\_SZ with Windows 3.1

```
REG_NONE = 0 ▶
```

```
▶ REG_SZ = 1
REG_EXPAND_SZ = 2
REG_BINARY = 3
REG_DWORD = 4
REG_DWORD_LITTLE_ENDIAN = 4
REG_DWORD_BIG_ENDIAN = 5
REG_LINK = 6
REG_MULTI_SZ = 7
REG_RESOURCE_LIST = 8
REG_FULL_RESOURCE_DESCRIPTOR = 9
REG_RESOURCE_REQUIREMENTS_LIST = 10
```



method for accessing the 3.1 registry uses the command line "regedit /v". This is intended for more expert users and produces the display shown in Fig 2. This alternative view reveals that the registry is simply an enormous tree structure.

The Windows NT version of the 3.1 registry (shown in Fig 3) is no different in structure from 3.1; it's just that the tree is a great deal larger. The "regedt32" command (available in Windows NT only) offers a multiple document interface (MDI) so that different bits of the registry can be viewed on screen simultaneously.

Before going any further, a word of warning — do not go randomly fiddling with the registry. Arbitrary "experimental" changes can be disastrous. This is especially true with NT. You wouldn't go messing around with config.sys without paying any care or attention, so treat the registry in the same way.

From Figs 2 and 3 it can be seen that the registry structure is vaguely analogous to the familiar Windows and DOS tree structured filing system. A registry entry is called a "key" (cf a file or directory) which can have sub-keys (cf sub-files or directories); the sub-keys can themselves have their own sub-keys and so on. Any registry key can have a value (roughly analogous to a file or directory date stamp for example). As with the filing system, the order of the keys is unimportant although it is not unusual to want them displayed in alphabetical order.

Instead of the more succinct "v" the registry root has the mysterious name HKEY\_CLASSES\_ROOT. Registry paths can be defined in order to locate keys in similar fashion to file paths. For example "txtFile\shell\open\command" is the path to the "command" key, a sub-key of "open", which is in turn a sub-key of "shell", then "txtFile" then the root — HKEY\_CLASSES\_ROOT. Note that this is the root of the 3.1 registry, but this same information is not in the root of the more general NT registry: it is only a minor sub-branch of a much larger tree used by NT.

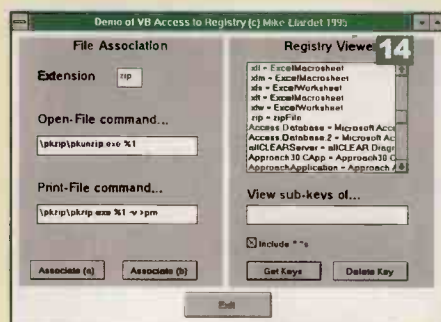


Fig 14 The Registry program in action

Fig 6 The RegDeleteKey function

RegDeleteKey

#### VB Declaration

Declare Function RegDeleteKey& Lib "SHELL.DLL" (ByVal hkey&, ByVal lpszSubKey\$)

#### Description

Deletes the specified key. When a key is deleted, its value and all of its subkeys are deleted. If the function returns an error value of ERROR\_ACCESS\_DENIED (see Fig 11), then either the application does not have delete privileges for the specified key or possibly another application has opened the specified key.

#### Parameters

hkey& (long) - caller supplies a handle of an open key, which can also be HKEY\_CLASSES\_ROOT, etc (see Fig 11). The key to be deleted is a subkey of this key.

lpszSubKey\$ (string) - caller supplies a string specifying the subkey to be deleted. The "\" character can be used as a separator in this string to specify a hierarchy of keys. Only the last key in the hierarchy (and its descendants) are deleted.

#### Return Value

The return value is ERROR\_SUCCESS if the function is successful. Otherwise, an error value is given (see Fig 11)

Fig 7 The RegEnumKey function

RegEnumKey

#### VB Declaration

Declare Function RegEnumKey& Lib "SHELL.DLL" (ByVal hkey&, ByVal iSubKey&, ByVal lpszBuffer\$, ByVal cbBuffer&)

#### Description

Enumerates the subkeys of a specified key. The first parameter of the RegEnumKey function must specify an open key. Typically a call to RegEnumKey is preceded by a call to RegOpenKey and followed by a call to RegCloseKey. To enumerate subkeys, the application should initially set the iSubkey parameter to zero and then increment it on successive calls.

Calling RegOpenKey and RegCloseKey is not necessary when the hkey parameter is HKEY\_CLASSES\_ROOT (see figure 11), because this key is always open and available; however, calling RegOpenKey and RegCloseKey in this case is a time optimisation. While an application is using values returned by the RegEnumKey function, it should not make calls to any registration functions that might change the enumeration of the key being queried.

#### Parameters

hkey& (long) - caller supplies a handle of an open key, or one of the HKEY\_CLASSES constants (see figure 11). The subkey information is retrieved relative to this key.

iSubkey& (long) - caller supplies an index for the subkey to be retrieved. This value should be zero for the first call to RegEnumKey, and incremented thereafter.

lpszBuffer\$ (pre-initialised string) - caller supplies a string initialised to a reasonable length (eg 80 characters). On return this buffer contains the name of the subkey. Note that RegEnumKey copies only the name of the subkey, and not the full key hierarchy, to the buffer.

cbBuffer& (long) - caller supplies the size, in bytes, of the lpszBuffer string above.

#### Return Value

The return value is ERROR\_SUCCESS if the function is successful. Otherwise, an error value is given (see Fig 11)



**Fig 9 The RegQueryKey function**

RegQueryValue

**VB Declaration**

Declare Function RegQueryValue& Lib "SHELL.DLL" (ByVal hkey&, ByVal lpszSubKey\$, ByVal lpszValue\$, lpcb&)

**Description**

The RegQueryValue function retrieves the text string associated with a specified key.

**Parameters**

hkey& (long) - caller supplies a handle of an open key, or one of the can be HKEY\_CLASSES constants (see Fig 11).

lpszSubKey\$ (string) - caller supplies a string specifying the name of the subkey of the hkey parameter for which a text string is to be retrieved. If this parameter is NULL or contains an empty string, the function retrieves the value of the hkey parameter itself

lpszValue\$ (pre-initialised string) - caller supplies a string initialised to a reasonable length (eg 80 characters). On return this buffer contains the value of the specified subkey.

Points to a buffer that contains the text string when the function returns.

lpcb& (long) - caller supplies the size, in bytes, of the lpszValue buffer, above. When the function returns, this variable contains the size of the string copied to lpszValue, including the null-terminating character.

**Return Value**

The return value is ERROR\_SUCCESS if the function is successful. Otherwise, an error value is given (see Fig 11)

Although Microsoft's C++ offers facilities for manipulating the registry, it is something of a challenge to find out how to work with it from within a Visual Basic program, as there is scant documentation available on the subject. Fortunately we have unearthed a dynamic link library called "shell.dll" which offers all the necessary API calls; and some further investigative work by yours truly has revealed how to use them. So, anyone wanting to incorporate registry operations from with a VB program should read on!

There are seven functions in shell.dll which work with the registry, and each is described in turn in Figs 4 to 10. The VB declarations are given for each and Fig 11 gives the various constants which can be used with these functions. The functions should work with both the Windows 3.1 registry and the NT registry, but their full scope is not available with 3.1. For example, there is only one type of key value available with 3.1 — REG\_SZ (a string) so RegCreatKey should only be called with its key type parameter set to this value. There is also only one type of root. In contrast with 3.1, numeric and other values can also be used with NT and the full set of

"REG\_" and "HKEY\_" types can be used.

In order to get a feel for the workings of these functions, we have developed a simple registry access program in Visual Basic (see Fig 12). All seven registry functions are used by this program, giving some indication of how they can be made to work in practice.

The form design for the program is shown in Fig 13 (page 630). There are few hidden secrets here: the two main areas of functionality are located on separate panels and the list box's "Sorted" property is set to true, so that it always displays keys in alphabetical order. Apart from that only the control names have been renamed to more meaningful values.

The program is shown in action in Fig 14 (page 632). The File Association panel manipulates the registry to introduce new file associations which can be used by File Manager, and the Registry Viewer enables different bits of the registry to be seen and/or deleted. It can be helpful to run this program in conjunction with the Registry Editor to see what is going on behind the scenes.

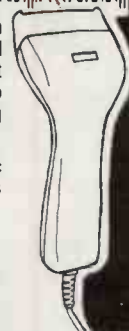
The File Association setup specified in Fig 14 enables ZIP files to be unzipped

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**Fig 8 The RegOpenKey function****RegOpenKey****VB Declaration**

Declare Function RegOpenKey& Lib "SHELL.DLL" (ByVal hkey&, ByVal lpszSubKey\$, lphkResult&)

**Description**

Opens the specified key. In contrast to RegCreateKey, RegOpenKey does not create the specified key if the key does not already exist in the registry.

**Parameters**

hkey& (long) - caller supplies the handle of an open key, or one of the HKEY\_CLASSES constants (see Fig 11). The key opened by this function will be a subkey of the key identified by this parameter.

lpszSubKey\$ (string) - caller supplies the name of the subkey to be opened. The "\" character can be used in this string to specify a hierarchy of keys, leading to the key which is to be opened.

lphkResult& (long) - on return from the function call this contains the handle of the key that has been opened.

**Return Value**

The return value is ERROR\_SUCCESS if the function is successful. Otherwise, an error value is given (see Fig 11)

directly from File Manager simply by double-clicking on them (assuming you have a copy of pkunzip.exe installed in the \pkzip directory). Electing to print a ZIP file from File Manager causes a summary of the ZIP file contents to be output to the printer. (This will work only if you have pkzip.exe in the \pkzip directory, and also may require the printer to be specially configured.)

The registry structure used by File Manager for file associations is not immediately obvious. Fig 15 shows the necessary underlying structure for the ZIP file case. Note that there are two main entries from the root — one associates ".zip" with "zipFile" and the other defines how ZIP Files are to be handled. The registry does not associate ".zip" with ZIP file handling directly as in theory there could be several file extensions to be dealt with in this fashion. This may not be relevant in this case, but there is, for example, a txtFile key which is used by both ".txt" extensions and ".ini" extensions so that both TXT and INI files are opened or printed using the same command (Notepad in this case).

The Registry Viewer panel is a rather crude viewing system, which nonetheless can be made to display any part of the registry. In effect, the text box below "View Sub-keys of" defines the holding key for all the keys displayed in the list box above. The GetKeys button causes the list box to

be refreshed, displaying the keys subordinate to the holding key along with their associated values, if any.

Any changes to the registry, like the ones made by the File Associations option, can be viewed by the Viewer, or alternatively they can be seen from the standard Windows Registry Editor. Note that the path to the keys should not start with a "\" (as would be the case if you were specifying a file path). Just enter something like "txtFile\shell\open" to see the appropriate sub-keys. If nothing is displayed then either the path does not exist, or else it does exist but it contains no sub-keys at all.

The Delete Key option should be used with caution, since it can easily remove information that you would ordinarily prefer to preserve. To use it, click on any key in the list box and then click on the Delete button. If you confirm deletion in the message box the Key is removed, along with all its sub-keys, their sub-sub-keys and so on. Potentially a lot of information can be lost in this fashion, so be careful.

The supplied program is intended primarily to demonstrate how the registry can be accessed from VB, but it can easily be

**Fig 10 The RegSetValue function****RegSetValue****VB Declaration**

Declare Function RegSetValue& Lib "SHELL.DLL" (ByVal hkey&, ByVal lpszSubKey\$, ByVal fdwType&, ByVal lpszValue\$, ByVal dwLength&)

**Description**

Associates a text string with a specified key. If the key specified by the lpszSubKey parameter does not exist, then RegSetValue creates it.

**Parameters**

hkey& (long) - caller supplies a handle of a currently open key or one of the HKEY\_CLASSES constants (see Fig 11).

lpszSubKey\$ (string) - caller supplies a specification of the subkey of the hkey parameter which is to be set. If this parameter is NULL or points to an empty string, the function sets the value of the hkey parameter itself.

fdwType& (long) - caller supplies specifies the values type. For Windows version 3.1, this value must be REG\_SZ, but other values are possible with Windows NT (see figure 11).

lpszValue\$ (string) - caller supplies a string specifying the text string to set for the given key.

dwLength& (long) - specifies the size, in bytes, of the string pointed to by the lpszValue parameter. For Windows 3.1, this value is ignored.

**Return Value**

The return value is ERROR\_SUCCESS if the function is successful. Otherwise, an error value is given (see Fig 11)



**Fig 12 Visual Basic program to manipulate the Windows 3.1 or Windows NT registry**

```

Dim msSubKey As String
Const MAX_PATH = 256&

Sub chkIncludeDots_Click ()
    cmdGetKeys_Click
End Sub

Sub cmdAssociate_Click ()
    'Example of RegSetValue in action

Dim lResult As Long          'return value from function call
Dim sExtension As String     'the usual 3 letter file extension
Dim sExtClass As String      'class associated with it (several exts can
                              share it)
Dim sExtClassDescrip As String 'class description - arbitrary display text

'Init values from the text boxes (should validate too!)
sExtension = "." & txtExtension 'eg ".ZIP"
sExtClass = txtExtension & "File" 'eg "ZIPFile"
sExtClassDescrip = txtExtension & " description" 'eg "ZIP description"

'Set ".ZIP = ZIPFile" in root..
lResult = RegSetValue&(HKEY_CLASSES_ROOT, sExtension, REG_SZ,
sExtClass, Len(sExtClass))
'Set "ZIPFile = ZIP description" in root..
lResult = RegSetValue&(HKEY_CLASSES_ROOT, sExtClass, REG_SZ, sExtClass-
Descrip, Len(sExtClassDescrip))
'Set "ZIPFile\shell\open\command = \pkzip\pkunzip.exe %1"...
lResult = RegSetValue&(HKEY_CLASSES_ROOT, sExtClass & "\shell\open\com-
mand", REG_SZ, txtOpen, Len(txtOpen))
'Set "ZIPFile\shell\print\command = \pkzip\pkzip.exe %1" -v >prn"...
lResult = RegSetValue&(HKEY_CLASSES_ROOT, sExtClass &
"\shell\print\command", REG_SZ, txtPrint, Len(txtPrint))
'Refresh list box in case its changed
cmdGetKeys_Click
End Sub

```

**PCW Cover Disk**

The full code for this month's Low Level is on the cover disk given with this issue of PCW.

adapted to perform useful registry operations from within an application. For example, the File Association operation could be incorporated in an installation program so that the installed application could be opened and/or made to print directly from File Manager without the user having to make the association manually.

With Windows NT at least, INI files are now being discouraged, and it is considered better practice to hold initialisation and other application-specific information in the registry. The functions given here can easily be modified to set up the initialisation information in the first place, and then to access and modify it as the application is used.

Some exploration of the NT registry can reveal all sorts of useful information, such as the values set up by the user in Control Panel. For example, with the functions given here it is very easy to check (or even change) the International settings for date and time formats, either on a global or a per-user basis.

**PCW Contacts**

Mike Liardet is a freelance programmer and writer. He can be contacted via the PCW editorial office or on email as [mliardet@cix.compulink.co.uk](mailto:mliardet@cix.compulink.co.uk)

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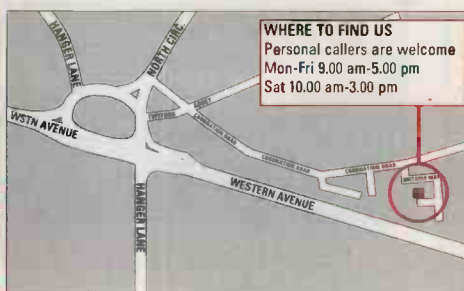
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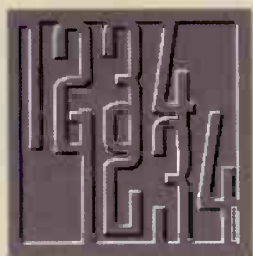


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# Binomial Coefficients

## Beginners Lesson Three — an introduction to Binomial Coefficients; plus a pot-pourri from recent correspondence. With Mike Mudge.

### BEGINNERS LESSON THREE

Given any positive integer  $n$ , the function FACTORIAL of  $n$ , written  $n!$ , is defined as the product of all the positive integers upto and including  $n$ . Thus  $6! = 1 \times 2 \times 3 \times 4 \times 5 \times 6 = 720$ .

Note that for convenience  $0!$  is DEFINED to be 1.

Given a positive integer  $n$  and a non-negative integer  $r$  less than or equal to  $n$  the BINOMIAL COEFFICIENT

$\binom{n}{r}$ , or  ${}_nC_r$ , is defined to be

$$\frac{n!}{r!(n-r)!} \quad \text{Thus} \quad {}_7C_4 = \frac{7!}{4!3!}$$

These coefficients have applications in the mathematical topics of The Binomial Theorem and Combinatorics, however these will not be required for the following material to be comprehensible.

It is easily shown, from the above definition, that:

$$\binom{n}{r} + \binom{n}{r+1} = \binom{n+1}{r+1}$$

thus

$${}_{10}C_5 = {}_9C_4 + {}_9C_5$$

and the scheme known as Pascal's Triangle for the generation of such coefficients is revealed:

$$\begin{array}{ccccccc} & & 1 & & 1 & & \\ & 1 & & 2 & & 1 & \\ 1 & & 3 & & 3 & & 1 \\ 1 & & 4 & & 6 & & 4 & & 1 \\ 1 & & & & & & & & & & 1 \end{array}$$

Here every element, except the bounding diagonals of 1's, is formed as the sum of its two nearest neighbours in the previous row.

Clearly these coefficients can be evaluated from the original definition, from the Pascal's Triangle Algorithm or indeed

from the equivalent algebraic result

$${}_nC_r = \frac{n.(n-1).(n-2).....(n-r+1)}{r.(r-1).(r-2).....1}$$

**Problem (A).** Implement the above three algorithms for  ${}_nC_r$ , check each using  ${}_{12}C_5 = 792$ , consider the ultimate limitations of each program by attempting, initially,  ${}_{200}C_5$  which is approximately  $2.53565 \times 10^9$ .

How do the ultimate limitations, in the sense of largest  $n$  &  $r$  values which can be handled exactly, compare with run-times? Could the latter be important in the evaluation of many such coefficients, see Problem (B) which follows?

Fig 1 shows a sample program, in BASIC, due to S. Balachandra Rao & C.K. Shantha...Numerical Methods..Sangram Books Ltd. 1992, £9.95; for the evaluation of Binomial Coefficients.

**Problem (B).** With reference to the

properties of Pascal's Triangle, Pascal himself wrote: "I leave out many more than I include; it is extraordinary how fertile in properties this is. Everyone can try his hand."

Verify that the entries in row  $p$ , except the units, are divisible by  $p$  if and only if  $p$  is prime. Verify also that the shallow diagonals  $1, 1-1, 1-2, 1-3-1, 1-4-3, 1-5-6-1...$  etc. sum to the Fibonacci sequence  $1, 1, 2, 3, 5, 8, 13, ...$  etc. (Each entry, apart from the first two 1's being the sum of the previous two.) Demonstrate rows containing three numbers in arithmetical progression, i.e. differing by the same constant (there are infinitely many of these!) 7-21-35 with common difference 14, next 1001-2002-3003 and then 490314-817190-1144066. Interest note: There are no such triplets in either geometric or harmonic progression, see David Wells, Curious and Interesting Numbers, Penguin, 1987.

### A STRUCTURED PROBLEM in DIOPHANTINE EQUATIONS Posed by C.J. Roberts of Twyford, Berkshire.

**Problem C<sub>J</sub>.** Find positive integers  $(A, B, C)$  which satisfy  $A^2 + B^2 = C^3$ .

(a) Investigate possible  $C$  in the range 2 to 100....2, 5, 8, 10 etc.

(b) Identify any such  $C$  for which there are multiple solutions for  $(A, B)...$  5, 10, 13 etc.

(c) Propose the rule for  $C$  which admits at least one solution  $(A, B)$ .

(d) Propose the rule for  $C$  which admits more than one solution  $(A, B)$ .

(e) Propose a rule which, given  $C$ , leads to the number of distinct solutions  $(A, B)$ . Note that  $C = 65$  or  $85$  has 8 solutions,

Fig 1 Binomial Coefficients: Sample Program

```

10      CLS
20      PRINT"*****"
30      PRINT"*"
40      PRINT"*      EVALUATION OF BINOMIAL COEFFICIENTS PROGRAM      *"
50      PRINT"*"
60      PRINT"*****"
70      LOCATE9,40:PRINT"n"
80      LOCATE10,26:PRINT"EVALUATION OF C":PRINT TAB(42);"r"
90      LOCATE15,32:INPUT"n=";N:LOCATE17,32:INPUT"r=";R
100     LET D=1:IF R=0 THEN GOTO 140
110     FOR Y=0 TO R-1
120     LET D=D*(N-Y)/(R-Y)
130     NEXT Y
140     LOCATE20,29:PRINT N:PRINT TAB(31);"C":PRINT TAB(32);R:LOCATE
21,36:PRINT"=";D
150     LOCATE23,19:PRINT"PRESS (SPACE BAR) TO START AGAIN":H$=
INPUT$(1):IF H$="" THEN RUN

```



## CLASSIFIED

while C = 25 or 50 or 100 has three solutions.

C.J. has solved (c) & (d) but so far not (e) completely.

## A TWO PERSON GAME — ODDS & EVENS

Posed by C.J. Roberts of Twyford, Berkshire.

**Problem CJ<sub>2</sub>.** Playing alternately two players shall draw either 1,2 or 3 counters from an initial pile of 2N + 2 counters. Say 23 for example...the winner is the player who finishes with an even number of counters.

Construct a winning algorithm for play in this case. How does it vary when you can draw from 1 upto M counters at any given time?

Responses to both the Beginners Lesson Three, THE BINOMIAL COEFFICIENTS and/or any of the problems CJ<sub>1</sub>, and CJ<sub>2</sub> may be sent to Mike Mudge, 22 Gors Fach, Pwll-Trap, St. Clears, Carmarthen, Dyfed SA33 4AQ, tel 01994 231121, to arrive by 1st July 1995. Any complete or partial solutions received will be judged using suitable subjective criteria, and a prize in the form of a £25 book token, or equivalent overseas voucher, will be awarded by Mike Mudge to the "best" solution arriving by the closing date. Such contributions should contain a brief description of the hardware used, details of coding, run-times and a summary of the results obtained; all in a form suitable for publication in PCW. Additionally, readers' comments upon the general or specific nature of this month's column would be most welcome. In particular, references to any recent work (either published or unpublished) on Diophantine Equations of the general type  $an+bn+cn+\dots=A^m+B^m+C^m+\dots$  would be appreciated.

Please note that material can only be returned if a suitable stamped addressed envelope is provided.

## FEEDBACK — BOTH POSITIVE AND NEGATIVE

There have been a number of letters from readers who were awarded prizes "by PCW" rather than "by Mike Mudge", i.e. results announced before the July 1994 issue of PCW, and who have not yet received their prizes. These were genuinely earned and awarded: please contact Adele Dyer at PCW to resolve this matter as soon as possible.

Readers who are experiencing difficulties in purchasing recent books in number theory — particular problems have

arisen with the second edition of Richard K. Guy's Unsolved Problems in Number Theory — are advised to contact Hinchliffe Books at 15 Castle Street, Thornbury, Bristol BS12 1HA. Tel: Thornbury (01454) 415177.

Light relief! Are there only finitely many squares, apart from  $10^{2n}$ ,  $4 \times 10^{2n}$  and  $9 \times 10^{2n}$  with only two decimal digits? e.g.  $38^2 = 1444$ ,  $88^2 = 7744$ ...3114^2 = 9696996...?

## Review of Numbers Count -139- November 1994: INT to ZIG-ZAG and something different

Despite its simple requirements in terms of logic and hardware, the FLOOR FUNCTION was totally ignored by readers' responses. Can someone please say why? Yes, I can! Apologies, but no proofs came from PCW.

$$" \left[ \frac{n}{p} \right] + \left[ \frac{n}{p^2} \right] + \left[ \frac{n}{p^3} \right] + \dots$$

the sum being continued until the terms become 0, i.e. until  $p^r$  is greater than  $n$  was intended. Now have a go at problems 0 & 1 for a future prize award, together with ZIG-ZAG.

However, Neil Croll's problem produced much interesting response; because of the nature of his work he is the very worthy prizewinner at 9 Carsington Crescent, Allestree, Derby DE22 2QY. Mention must be made of the link with "Pieces of Eight" from PCW 1992 February and the generalisation to an alphabet of  $k$  characters, say 0,1,2... $k-1$ . What is the minimal length string that when viewed cyclically includes all possible length- $r$  strings as substrings? Furthermore, how many such minimal length strings are there?

For  $k=2$  see Martin Gardner's discussion of Bacon's Cipher in Knotted Doughnuts and other Mathematical Entertainments. The number of solutions is  $2^x$  where  $x=2^{r-1}-r$  so for Croll's original problem there are  $2^{26}$ . Interested readers are also referred to The DIPOLE Column in IEE News (no. 28) of 3rd August 1989 and its follow-up.

## PCW Contributions welcome

Mike Mudge welcomes readers' correspondence on any subject within the areas of number theory and computational mathematics, together with suggested subject areas and/or specific problems for future Numbers Count articles.

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## Bad timing

**Everything was all right round at Stephen Rodda's until he tried adding a card to his LAN. Three in the morning isn't the best time to find out it's all going horribly wrong.**

I've just been adding a card (and therefore a PC) to our LAN. It's a perfectly respectable make of NIC: National Semiconductor. But, it's got all these funny settings which mean that it makes the PC seem like it's got memory errors or something's crashing a *perfectly* respectable PC. The PC by the way is a 486DX/33 Research Machines EISA machine and until now I've had no problems with it.

The card is a National Semiconductors Atlantic, and just getting into the setup program (this was an ISA card on an EISA machine) and switching on all the timing-critical stuff made it stable. Now I wouldn't mind much, but for the fact that the disk-based documentation said these registers were only for those who understand the chipset and would not be elaborated upon further.

Unfortunately I found this out at around three in the morning, once I'd eliminated everything else from the possibilities which could have caused the machine to lock in various ways. I even stole RAM from the printer, just in case that was causing a problem. It did cause a problem, because just as I'd opened the LaserJet to take the RAM out, my partner wanted to print. Eventually, with everything replaced and the settings adjusted, the machine started to work. I was not a happy journalist.

I've been installing the real version of OS/2 Warp recently, as well. As before, I commented out drivers for adaptor cards on the second disk which my machine didn't possess and started to install. Once I got to the second disk, my machine crashed. Repeatedly. I found out by calling IBM that I shouldn't have used a semi-colon in order to remark these lines out, but I should have typed "REM". Once I'd

fixed this, the installation proceeded beautifully. You'd think IBM would have included an error-trapping mechanism, perhaps something on the lines of "Invalid command in CONFIG.SYS line 17", but no. It just crashes with an error which it takes a couple of days to sort out. Full marks go to IBM for a version of Warp

which runs on my PCI machine (the beta didn't), but a poke in the eye for not recognising this (fairly) simple problem with the Config.sys, although it was my own stupid fault for not using "REM".

I've recently been playing with remote control packages (to name them, LapLink for Windows and Carbon Copy for Windows). Both seem to be really difficult to install and to use. The test machine (the one that I was moaning about in the previous section) was configured with 4Mb of RAM and around 100Mb of hard disk. I realise that most of my readers will have that amount of RAM, since many people will not be running bloated applications like Word 6.0 and Excel 5.0.

As long as you keep away from these memory hogs, you should be able to run Windows for Workgroups in 4Mb of RAM (well, perhaps 6Mb of RAM). I know very well that when clients of mine (who had 2Mb) wanted to run Word for Windows, I said they should upgrade to 4Mb (and that was Word for Windows 2.0).

Now, the most usual machine is 4Mb and around 100Mb of hard disk, so that is what I used. The problem is that once Windows and the remote control software are

### The Perils of Remote Control

*Perhaps it's a trifle ambitious to expect two Windows remote control packages to install over a couple of days — especially if you want some RAM left over for the application you're trying to control. At least Carbon Copy (below) asks whether it can replace all your communications and screen drivers: LapLink (top) just jumps right in and does it*



loaded, there isn't enough free RAM for the application you're going to control remotely! I even tried Ameol (an offline reader for CIX) and it complained — not in so many words, but it took a long time to run and to sort a downloaded scratchpad into its database.

Back to the point, though. As a result of Windows loading all four networking protocols (802.3, 802.2, Ethernet II and Ethernet Snap) I found LapLink to be confusing NetWare's own built-in router by advertising its services over the

network. Carbon Copy was, however, a little more polite than LapLink: it asked whether to replace communications and screen drivers. LapLink went straight ahead and did so.

Having wasted a couple of days simply trying to install the whole shooting match, I'm more than a little fed up with the way that neither package seems to work. I'm sure they must, but as yet I haven't been able to get them to perform. Perhaps I shall persevere and let you know in my next column.

## Questions & Answers

### Networking Windows PCs

I saw your Networks column in PCW February 95, in particular the reply to the Imperial College student who wanted advice on a cheap network, and wonder if you could give me some advice, or at least a pointer or good reference.

I know a lot about PCs and quite a lot about PC comms (especially setting up TCP/IP applications over packet drivers and ODI drivers, and even a little of the theory of TCP/IP). I know very little indeed about the physical network; I just plug the drop cable in the socket in the wall.

A very small Brighton-based charity for which I do voluntary work has asked if I can network two Windows PCs, one upstairs, one downstairs. They would like to be able to share files and printers. Windows for Workgroups seems like one possibility, Personal NetWare another, but there may be other options (Little Big Lan?). What is the minimum hardware I need? Does it have to be Ethernet?

Thanks for any help you can give.  
**L.B-D@sussex.ac.uk**

Since it's only a couple of stations at the moment, I'd suggest you start with cheaper-net (10base2) cabling. This has the advantage that anyone handy with a soldering iron can install a basic network without any problems. The cable is really just as simple to connect as a VCR video lead. The other advantage with thin Ethernet (10b2) is that hubs, which can be the most expensive part of the network, are not required.

Hardware required for any form of networking:

- Two Ethernet cards (available for as little as £30 each)
- Two tee pieces (come with the cards)
- One length of cable with BNC plugs on each end
- Two terminators.
- Network operating software

By the way, what's wrong with Ethernet? The whole thing shouldn't come to more than

about £150. Get a local dealer to quote for a charity price on the Windows for Workgroups, as it, like most other software, has a special charity and student rate.

Any networking software which works (preferably Windows-aware) will do. I wrote a comparative review of P2P LANs in a recent copy of PCW. I'd suggest you go for WfWg if only for simplicity in setting it up. There is actually nothing much to choose between any of the P2P LAN systems. I'd probably not recommend Little Big Lan in this case, simply because the charity would want something they could be taught to administer in an afternoon. LBL, although good, requires a certain technical competence so I wouldn't recommend it for a simple starter LAN without an administrator.

### Long-distance network

I am new to the field of networking. In fact, I don't have a professional involvement in the subject, just an enthusiastic interest. A friend of mine, who runs a business, has asked me to advise on a network to link together his three computers. Nothing very special, you would think, but the unusual feature of this installation is the distance involved. Two of the computers are going to be in a building on top of a hill while the other machine will be in a separate building 180-190 metres away down the hill.

I am sure you have noted that the distance involved is a full thin Ethernet segment length. Added to this, of course, will be the internal cabling in each building, giving an overall network length of more than 250m.

I have three ideas on how to implement the network and would appreciate your comments and advice. I have chosen to stick with thin Ethernet on the grounds of cost.

- 1) Use NICs that can "work" a cable length greater than 185 metres. You have mentioned, in one of your articles, that SMC and Longshine NICs are capable of driving up to 300 metres of cable.

- 2) Use a repeater where the cable enters each building. This would split the

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network into three segments, the middle segment being at the maximum recommended length.

3) Use a hub in place of the repeaters. The hub would have one co-ax port and, say, four UTP ports. The hubs would be connected together via their co-ax ports, so coping with the main cable distance, and the UTP ports would be wired to the computer/s in each building.

The other area where I would value your advice is in network electrical safety and protection. One building is in an exposed position on top of a rise and is liable to lightning strikes. The cable joining the two buildings will be outside, part overhead and part underground and consequently very exposed. A possible further complication is that the buildings are on separate mains supplies and on different phases.

Should I be concerned with these potential [groan — SR] problems? Are there any hardware solutions? I am thinking in terms of lightning arrestors on the cable where it enters each building, and something to guard against differences in earth potentials between the buildings in case of mains problems.

**DC, Nottingham**

The main problem that I can see with this arrangement is (as you've correctly identified) potential potential difference. I've heard of cases where the LAN cable has melted as a result of differing earth potential between two buildings, let alone fortuitous (accidental) connection to two different phases of the mains. There are a couple of ways around this.

Firstly, you could use DIX (thick Ethernet) which has a maximum cable length of 500 metres and therefore will work as a spanning length between the two segments. This, coupled with an opto-isolating transceiver at each end, could be a reasonable solution, although FDDI (fibre-optic) is coming down in price and, of course, this means would certainly provide its own opto-isolation. On re-reading the original message, 10base2 (cheaper) would also work, assuming your optical isolators will also repeat.

Secondly, you could look into the possibility of using a radio LAN; this might be competitive as far as cost is concerned. Other possibilities, including laser and microwave, also exist; you might have to ask for demolevaluation equipment from the supplier of your choice.

**Restrictions on students**

I read your Networking article about the students at Imperial College, London with great interest. I thoroughly enjoyed it — yes, I'm a

network freak (and still at school — almost at college!). We've got a network at school but unfortunately, because I'm still a student, I'm unable to see a great deal of the administrator's side of things. I was wondering, is it possible to install Windows NT Workstation on a standalone PC with no network card?

I've looked into using Windows NT Workstation 3.5 and, in general, it sounds like a superb operating system. However, as always, nothing's perfect. I've read some messages from the Delrina Forum about WinFax Pro 4.0 and Win-NT-Wk. Apparently, WinFax will not run under NT. Do you know if this is true?

My modem is a SoftCom (an American one; I didn't know this when I bought it) which is software controlled — i.e. each time the computer boots, it loads up configuration drivers from DOS. Will this affect it in any way, as I read that you cannot set up 16-bit apps as services.

I would appreciate your advice.

**OE @compuserve.com>**

Thanks for the letter — I'm always ready to reply to my fan mail...

I think it's probably short-sighted of any educational body which has something that is potentially incredibly powerful for teaching, to lock it away and create an air of mystique about it. I, of course, understand the necessity for security as far as confidential files are concerned, but why not have another LAN where students are able to have a look at the administration of a server? I believe it would make possible computer delinquents — not suggesting you are, mind — more aware of the necessity of keeping a server up and running, and also it would give them a sense of the value that networked equipment has to those who work on it. In the same vein, if someone's going to try to crash a network, they'll learn about the administration commands, hacks and so on without being taught. I could go on, but see March's column for my views on this.

Yes, you can install NT Workstation on a machine without a network interface card, just the same as it is with Windows for Workgroups. Don't forget, however, you'll need a whole bucket of RAM!

Your modem will probably be loaded with its internal software at startup time; NT should be able to do this without any problem.

**PCW Contacts**

Stephen Rodda is an independent computer consultant specialising in DTP and networking. He may be contacted as the\_bear@cix.compulink.co.uk



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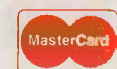
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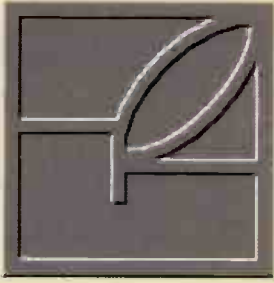
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## And there you **AV** it

**This summer will see the launch of the fastest PowerMac yet, the Tsunami, complete with six PCI slots. Chris Cain prepares for the next generation and makes the most of the AV models.**

**A**long with the latest new machines and third-party software updates, this month's Hands On Macintosh looks at AV PowerMacs. There are tips on setting up the built-in video digitiser, and how to improve the playback of your own and pre-recorded digital movies. Finally there's the latest in shareware entertainment from Ambrosia, producers of Maelstrom.

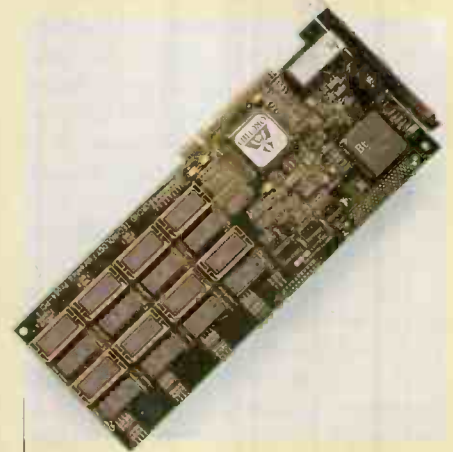
### PowerMac generations

The juiciest rumour of the month is that this summer will finally see the launch of

the long-awaited next-generation PowerMacs. Designed for just about every occasion, these machines will boast faster processors, more multimedia hardware and a new expansion bus.

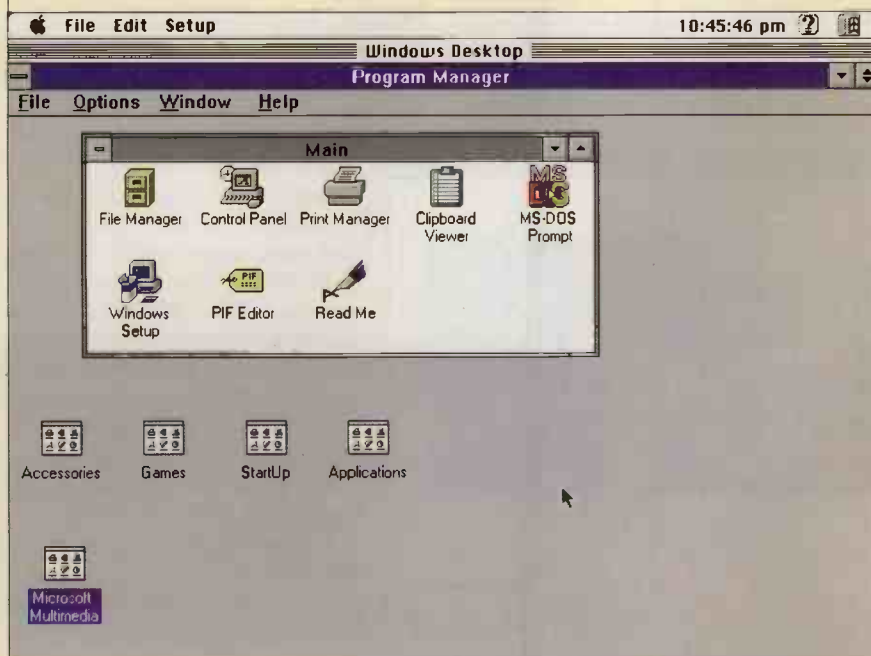
Top of the line and first out of the door will apparently be Tsunami, a PowerPC 604-based workstation with six Peripheral Component Interconnect (PCI) slots. Expected to cost around \$5,000, it will be the fastest Mac yet and may sell without built-in video, opening up the market for third-party boards as in the PC world.

As well as making it easier for existing PCI card manufacturers to break into the Apple market, this will please those Mac add-on companies which find it difficult to



*Award-winning PCI graphics cards could soon be heading the Macintosh way*

*Aaaargh — Windows! Insignia is soon to launch a new version of SoftWindows that emulates a 486 PC*



compete with Apple's own "free" video circuitry. As I see it, as long as we don't end up with a PC-compatible situation and a million and one drivers, users won't mind whose hardware they have.

Scheduled for later release are two new mainstream models, codenamed TNT and Nitro, bringing the PCI approach to a wider audience. Both are said to have three expansion slots and another direct-stream digital audio video (DAV) slot for enhanced multimedia operations. Prices are expected to be around the \$2,000 mark for the 100Hz 601-based TNT, and a thousand dollars more for the more powerful 604-based Nitro.

Other rumours speculate on new 601-based models for education and a home LC-class PowerMac. As usual, Apple refused to comment on these and the other machines, which suggests these details are likely to be relatively close to the mark.

Far more solid news was Apple's success at the recent Windows show, where attendees displayed great interest in the PowerMac 6100 DOS compatibility add-on card. An elegant solution for those who need to work with both platforms, the card provides a 486DX2/66 PC, with 8Mb of RAM, 512kb SVGA graphics and Sound-Blaster 16 support. It allows users to run Windows and DOS programs at high speed, and to switch between the Mac and

PC environments on the fly. Clipboard contents can be shared between platforms, along with the Mac monitor, keyboard, mouse and CD-ROM drive.

If it works as well as Apple claims, the DOS card could provide the security that existing Windows users need before they switch to Macintosh. The only limiting factor is that it currently only works with the 6100: versions for other Macs are a must. The DOS compatibility card costs £470.

Also on the Windows compatibility front, Insignia has given sneak previews of SoftWindows 2.0. The company claims this new version emulates a full 486, has Windows sound support and even plays Doom (although without SoundBlaster sound). As soon as this program arrives in the office I'll let you know exactly how good it is.

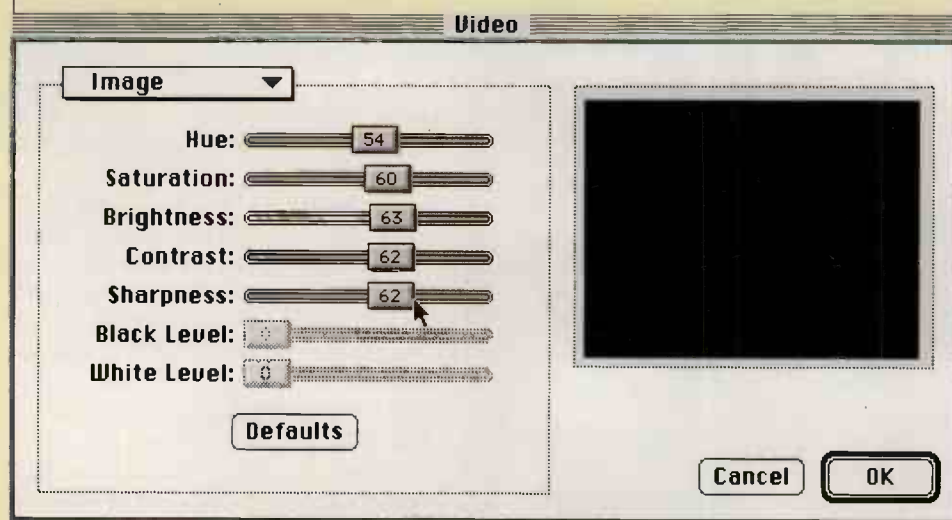
The last newsworthy item this month is that Microsoft has responded to user pressure over the sluggish performance of Word 6.0 for Macintosh. In a recent press release the company announced a new version, 6.0.1, which addresses a number of issues to give the software a much-needed boost. Affecting just about every Mac user the improvements include reduced boot times, especially for users with a lot of fonts on their systems, as well as faster word counts, the elimination of type-ahead problems with x030 machines and an overhauled printing routine.

The new version will be made available free of charge to any licensed user of Word 6.0 for Macintosh. It just goes to show the power of the user.

### Picture perfect

The built-in video digitiser in AV PowerMacs provides an easy way to get pictures

*Setting the image preferences to your exact requirements in FusionRecorder*



from television, video cassette or Laserdisc onto your hard disk and into applications. This month we take a closer look at Video Monitor and FusionRecorder, two capture programs supplied with the machine, to see which features and functions can be used to achieve the best results.

Video Monitor is the easiest of the two to get to grips with, partly due to its interface but mainly because it doesn't do much. Video Monitor lets you display an incoming video signal on your screen and capture a single frame, then save it to disk. The frame size can be adjusted between quarter-size and full-screen, and the program supports both NTSC and PAL broadcast standards.

To get started with Video Monitor you simply double-click its icon, which produces a small monitor window on screen showing any incoming images. If you're running your Mac in millions of colours you will need to reduce the display to thousands of colours or less for everything to work. This is because video work requires a lot of VRAM, so the amount used by the conventional graphics display must be reduced.

The next stage is to tell the program where the video is coming from (TV, Laserdisc or VCR) and whether the material is in NTSC or PAL format. You do this by selecting Video Settings from the Record menu and clicking on the appropriate radio buttons that pop up.

Once you have a picture, all that remains is to set the desired size of the monitor window using either the Monitor menu or Command key and number combinations. Now just wait for the frame you want to appear and press Command+C to copy it. As a default the data is pasted into the clipboard, but you can set the program to write it directly to the hard disk. Video

Monitor can automatically compress captured data before it's stored, but you can't adjust the level of quality.

### FusionRecorder

FusionRecorder takes everything one stage further by allowing you to record your own QuickTime movies with sound. Again the program has a video display to show any incoming pictures, but this time there are buttons across the top to start and stop recording.

The size of the display window relates directly to the recorded movie and can also affect the frame rate: the smaller the images, the more chance you have of capturing a smooth sequence. The target frame rate is set using the Video Settings option from the Record menu, which produces a dialogue box with options similar to those in Video Monitor.

When setting the frame rate you must be realistic: it's unlikely you'll be able to capture at 30 frames per second without dropouts. A good average is around 15fps, as this will provide you with reasonably smooth material, even at high bit-depths, and doesn't take up that much disk space.

A new option in Video Settings gives the ability to select a compression algorithm, and the choices you make here determine the overall quality and space taken up by captured material. The more compression you have the worse things will look, but the less space the resulting data takes up. VideoFusion allows you to use all QuickTime CODECs, including CinePak, Apple Video and Animation, so you can choose the one that best suits your material.

In tests I found that Cinepak works best for normal film or TV-like footage, while the Animation option is best for sequences with large areas of flat colour, cartoons for example. Compression can be switched off if you're just mad about picture quality, but you'll need to have a lot of storage space free to use this.

Once you've set the options to your taste, hitting the Record button or Command+T starts the capture process. The finished results appear a few seconds or minutes later, depending on the length of the sequence and how much hard disk space you have available. The data can then be compressed and saved to disk for use with another application such as Adobe Premiere.

FusionRecorder is given away free with AV PowerMacs, but it does provide a good way to get started with video capture. When



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your needs expand you can move on to a more professional package, but for experimenting it's hard to beat.

### Playback time

Playing back your own or even pre-recorded QuickTime material smoothly can be a problem for many Mac users. Much of this is down to the raw power of the machine — sequences work better on a PowerPC601-based PowerMac than on a 68030-powered IIfx — but there are a few things you can do if you want to improve performance.

One easy improvement is to use a player that can pre-load material into RAM for faster data access, such as Fast Player or Pete's Player. RAM is much quicker than even the fastest hard disk, and the more you allocate to a movie, the smoother it will be. Both Fast Player and Pete's Player can be obtained from any good shareware library. Having said this, for full-screen 640 x 480 pixel motion you can do a lot worse than the Print to Video option on Apple's own MoviePlayer.

Another big difference can be made by using built-in video or PDS video cards if possible, rather than NuBus devices. NuBus was great in its time, and many top graphics cards from the likes of Radius are seriously quick, but in tests I've found that internal or local bus hardware works much better. Try it for yourself and see.

Finally, make sure you're using QuickTime 2.0. Thanks to an improved datapipe this gives much better results than previous versions and can support full-screen 30fps software movies on top-end PowerMacs. Playback drops to 30fps at 320 x

200 pixels on 68040 models such as the Quadra 800, but even this is impressive.

### Maelstrom man

When it comes to shareware Mac games, Maelstrom from Ambrosia Software has become the standard by which others are judged. It's just a revamped version of the classic Atari game Asteroids, but it's so well done that you'll find it on almost everyone's hard disk. While wandering around eWorld this month I discovered Ambrosia's latest game, by the same author, Andrew Welch.

In keeping with tradition Apeiron is a remake of another Atari classic, Centipede, and is available to try out in the same way as its predecessor. For the uninitiated, and I can't believe there are many, the idea behind this is to shoot at invading alien centipedes, known this time as Pentipedes, in a desperate attempt to save the galaxy and score points. Simple stuff but highly addictive. As with Maelstrom, the gameplay is enhanced by excellent use of sound effects and music.

Apeiron costs just \$15 to register and you can pay in a number of ways, including VISA. To download it from eWorld, simply log on and go to the shortcut "Ambrosia".

PCW

### PCW Contacts

Chris Cain loves to hear from Mac users and can be contacted via email as [chris\\_cain@pcw.ccmil.compu-serve.com](mailto:chris_cain@pcw.ccmil.compu-serve.com), on eWorld as Cain or simply by writing to PCW. He is particularly interested in any useful system extensions, utilities, shareware and free stuff.

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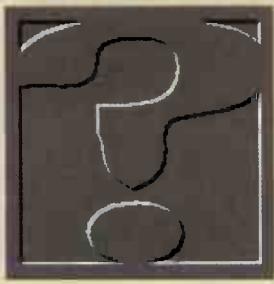
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## Any questions?

**If you've got a PC problem or think you could help other readers out, contact Frank Leonhardt.**

### Shell shocked

My computer is a Gateway 2000 4DX2/66P with 8Mb RAM, 540Mb hard disk and CD-ROM.

I recently had a GPF in Windows, followed shortly afterwards by a shaded GPF type box mentioning something about a "tempus fault". I then had all sorts of problems, finally solving the trouble by disabling my 256kb cache.

Ever since, if I enable the cache on the setup screen and reboot, after displaying "Starting MSDOS..." the computer either locks up or puts up an error message saying "Cannot find shell, type where shell can be found (e.g. c:\command.com)". However, no matter what I type, or even if I put the shell=command.com line in config.sys, I can't remove that error message.

To start with, I thought it might be that the cache had failed, but in the early stages of booting when it lists all its relevant parts, it says "256kb SRAM passed", so it appears that it's working properly.

Any ideas as to what the problem is?

**Jonathan Sandys**

100417.2615@compuserve.com

*It could still be a cache fault. How does the BIOS test the cache before telling you it is okay? Not very well is the probable answer. It will talk to the cache controller and find out how much RAM there is before turning it on if the BIOS has been set to do so. As far as the BIOS is concerned, if it gets a reply then the cache has passed the test. There's no easy way to do*

*a proper RAM test in less than a minute, even with hardware memory-test functions which you probably don't have. (The power-on main memory test is also a waste of time.)*

*Try removing the cache RAM and fitting it back 128kb at a time — you might identify a faulty chip this way, or the simple act of re-seating them in their sockets may cure a loose connection.*

*If you're unlucky, the motherboard chipset information has become corrupted in the crash you mentioned. Modern motherboards are made using general-purpose PC chipsets which require configuration to work in each specific motherboard. These chips are often configurable from the BIOS setup program (often called Advanced Chipset Options) or from a special program which has to be loaded from disk. When you enter setup mode, return things like the wait states and RAS pre-load times to their default values.*

*If this cures the problem you can start reducing the wait values one at a time until you find out whatever stops it working. If this doesn't do the trick, send the machine back to Gateway — it looks like faulty cache circuitry and Gateway should be able to sort it out.*

### Going for effect

I have a new (as in "recently introduced") motherboard — a GA-486IM. So far no problems, apart from sound effects in Doom (both I and II). The music is fine, and so is the sound in all other programs.

I have a SoundBlaster version 2.0. When I try sound, it loads quite a way to "setting up sound" then comes up with a reading error from Drive C:. Someone else with the same motherboard has an identical problem.

The hard disk has a normal combined VL Bus I/O and IDE controller; no cache nor room for it. It controls one 3.5in floppy drive and two hard disks, one 102Mb and one stacked 210Mb. Doom runs from the unstacked drive.

**kestar@cix.compulink.co.uk**

*It could be all sorts of things, but none of them sound likely. My first guess is that Doom is clobbering something on the drive controller which it wasn't expecting to find. The sound effects are stored as digitised sound waves, unlike the music, so there's nothing odd about the music working even when the sounds aren't.*

*To play a wave it must be loaded into RAM. The SoundBlaster then uses a DMA channel to read the wave from RAM and transfer it to the speaker. Most IDE drives do not use DMA so there's unlikely to be a direct conflict here. It is still possible that Doom has messed up the drive hardware while playing with DMA or interrupts.*

*The various disk driver programs are often linked together in memory. When a disk access is attempted the request is passed down from driver to driver until it arrives at the one for which it is intended. Therefore an apparent failure on Drive C: could be caused by a real failure with one of the other disk drivers — or quite possibly the stacker driver.*

*Doom is fairly well behaved and tends to work with disk compression software, but there will always be exceptions. One reason why you may only be experiencing this problem is that the game runs in 32-bit mode using a system known as a DOS extender. I wouldn't be surprised if the DOS extender, which does funny things to the BIOS, is the route of the incompatibility with your motherboard.*

*Good luck!*

### More haste, less speed

I can no longer play Wing Commander on my PC since I got a 486DX2/66. Help me — what fix do I need to slow it down?

(By the way, I loved your



*All Doom and gloom: the music's fine, so why aren't the sound effects up to scratch?*



### The latest SHARE option

In January's Computer Answers I explained what SHARE.EXE was all about and mentioned that it wasn't needed for Windows 3.11, as this included the VSHARE.386 driver as a replacement. A few readers have asked me to expand on this point.

VSHARE.386 was added with Windows 3.11 (also known as Windows for Workgroups) but it isn't compatible with Windows 3.1.

Just to confuse everyone, Microsoft has now released Windows 3.11 *not* for Workgroups, and I believe it is compatible with this version too. There was also a short-lived Windows 3.1 for Workgroups but you aren't likely to find it in use.

It is normally safe to remove the line which loads SHARE.EXE from your AUTOEXEC.BAT file if you are using Windows 3.11's VSHARE.386, unless anything tries to make use of it before Windows has started.

Applications that wish to use SHARE.EXE (or VSHARE.386) can tell if it is installed by making a system call, so they should warn you of its absence before doing any damage.

If you wish to leave Windows and run a DOS application which does require SHARE then you can always load it from the command prompt first.

comments in the January issue about not buying a Pentium — prescient or what?)

**Tom Zunder**

**Zunder@nochet.demon.co.uk**

*Easy! Remove the 486DX2 and send it to me. I'll send you a 486SX/25 (or even a 386SX/16) in return. Alternatively, there will almost certainly be some jumpers on the 486 motherboard for adjusting the clock frequency. When you have found out what they are you should be able to drop it down to 25MHz from 33MHz, which may be enough. If not, try disabling the 486's internal cache which will seriously reduce any benefit obtained from the CPU's clock-doubler.*

*My sagacious comments about undiscovered bugs in the Pentium were actually written a couple of months prior to the FDIV bug going public and were therefore just a lucky guess. With all the Pentium hyperbole coming out of Intel it was sure to fall on its face eventually.*

### Chasing the bus

Does anyone know where I can get information about the 100-pin bus expansion slot on a Librex V386SX? Since Nippon Steel Computers left the PC computer market it has been very difficult to find out any information about them. I am told it may be an ISA-type slot.

Secondly, does anyone know about a Walters expansion/docking station which has room for two bus slots and floppy drive? This uses a 144-pin connection to whatever computer it was designed to go with. I did have thoughts about seeing if the computer and docking station could be used together...

Since I bought it, I've added a maths co-processor, 5Mb memory and 210Mb hard disk. Even though this machine is getting a bit long in the tooth, it still copes

sufficiently well for word processing, spreadsheets and stats for most of my needs, as well as standing up to the rigours of dust, fluctuating voltages and being transported around various countries in Africa.

**John AC Steel**

**J.A.C.Steel@newcastle.ac.uk**

*It might be a direct ISA bus (they have 98 pins) but I'm afraid I can't be much more help than that. As for the Walters, the 46 extra pins are probably used to duplicate the monitor, serial and parallel ports as well as the bus itself.*

*You could try upgrade specialists like Powermark, although problems with expanding notebooks are very common and usually impossible to resolve.*

*The golden rule is to buy a notebook fully expanded to suit your needs, including the docking station. Just because a docking connector exists it does not mean that you will be able to buy the docking station in the future. In many cases the docking station will have got no further than a gleam in the manufacturer's eye, so don't be fobbed off with lines like: "Don't worry — this notebook is so new that it will be a month before the docking station is in stock."*

### PCW Contacts

**Frank Leonhardt** is an independent computer boffin who can sometimes be contacted on 0181 429 3047 or via email as [frank@dircon.co.uk](mailto:frank@dircon.co.uk) or [leo2@cix.clink.co.uk](mailto:leo2@cix.clink.co.uk). Letters may be sent to PCW at VNU House, 32-34 Broadwick Street, London W1A 2HG, but individual replies are not normally possible. Please do not ask about cover disks or CD-ROMs.  
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## Peer pressure

**Word for Windows may not be an ideal networking application, but for smaller groups it can be a good tool for sharing resources. Eleanor Turton-Hill sorts her workgroups from her Ethernet.**

**M**ost people who use Windows for Workgroups do so either on a standalone PC or on a LAN (Local Area Network) running Novell NetWare. But WFW is actually designed as a network operating system in its own right and provides a simple way for small numbers of PCs to link together into what's known as a peer-to-peer network. When installed on a standalone PC it behaves in exactly the same way as Windows, but on a LAN it provides sharing facilities and the ability to define user rights.

Unlike standard Windows, WFW allows your computer to act both as a client and as a server. Under Windows your PC can be a client by "taking" network resources, but under WFW you can turn your computer into a "peer", which means that it can both give and take network resources. This idea is fundamental to peer-to-peer networks because they allow the resources of each PC's hard disk to be accessible to other PCs connected to the LAN.

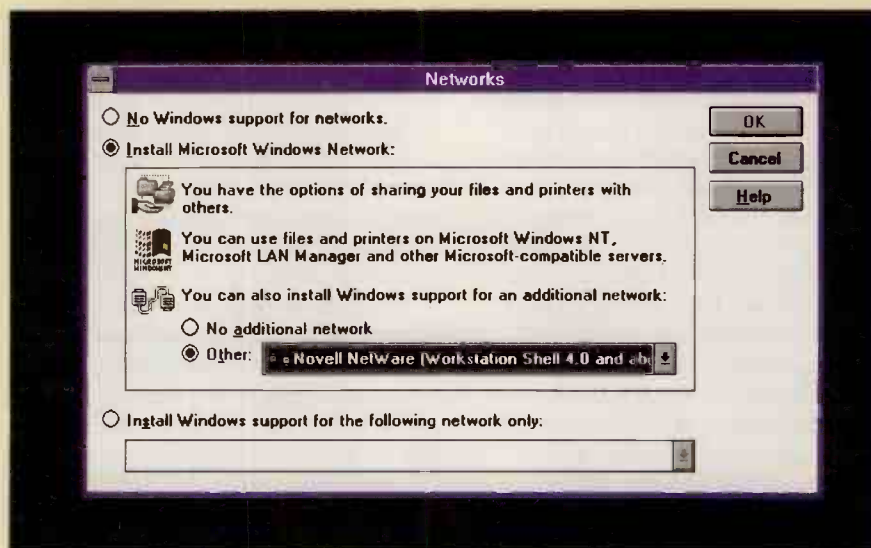
This kind of setup only really works for small workgroups of PCs. Larger numbers require one central fileserver which holds shared applications and data. Under this configuration each computer acts as a client requesting services from the server, and all PCs on the network can see the server, but none can see each other. Unlike WFW this client/server configuration can support hundreds of computers linked together.

### Network traffic

Before you set up WFW as a network, you'll need to think about the amount of

share resources. This communication or network traffic takes place in short bursts known as "packets". If a shared file is copied from one PC to another it is broken down into small pieces of data or packets of information and reassembled at the other end. Transmitting data in this way makes network communication smoother and prevents one computer from hogging up the entire LAN when sending a particularly large file from A to B.

The volume of network traffic increases according to the number of users attached to the LAN. When a large amount of users are making heavy use of shared resources, response times slow down until eventually the whole system reaches saturation point. This happens when too many users are sharing files at the same time and generally results in unfriendly error messages



*This Networks dialogue box allows you to set up WFW in three ways. The first one is a standalone version which allows no network support. The second allows you to install WFW networking facilities, such as electronic mail or file and printer sharing, while the third allows you to install support from a selected list of networks*

network traffic the system can handle. Most importantly, you'll have to consider how many users are in each group and what resources they are using.

Each computer on the LAN running WFW is continually sending messages to the other PCs to check that they are still active. Each PC needs to know that the others are continually available for access so that they can successfully

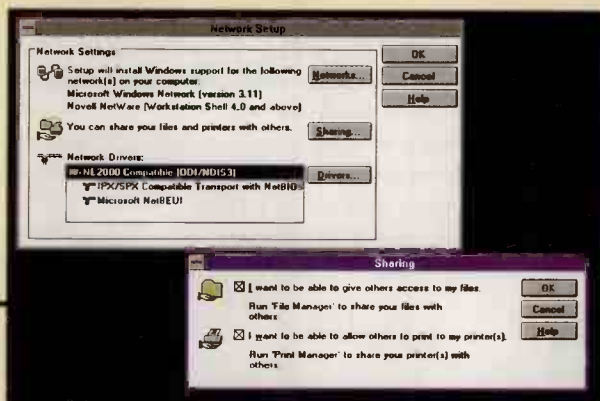
such as "Network Drive No Longer Available".

This kind of problem arises when a PC is sharing files with other PCs on the network. The LAN has no problem with reading and writing files to your own hard disk, but a shared file is handled very differently. When you request a certain file from another shared PC, a copy of the file is made and transmitted over the LAN from the source computer and into your computer's memory.

Database applications are particularly likely to cause this kind of problem as they make frequent reads and writes to files. Officially, WFW places no limits on how many users can be attached to a network, but in practice it is very restricted. If you have a reasonably large group of users all making heavy use of a



*The Network Setup dialogue box which appears during installation. The sharing option allows you to set up WFW to share files or printers over the MS Windows network*



database, then the LAN is likely to collapse in no time at all. Sometimes, the only solution to this problem is to migrate to a more powerful operating system such as NetWare 3.1 or 4, but this is expensive. Before throwing money at the problem, it's worth considering ways of reconfiguring the WFW setup.

### Defining the workgroup

The most fundamental factor when resolving problems of network congestion is defining the workgroup. In order to achieve the most effective workgroup setup, you'll need to look carefully at the way people interact with each other in the office. A LAN is often organised so that everyone in the office is cabled together, but because of the limitations inherent in WFW, small workgroups generally function better.

There are several key questions which you need to ask before setting up your office workgroups. First, sort out which groups of people share files and printers with others and who interacts most with whom in their day to day work. Sometimes, the office workload falls neatly into independent categories, but in most offices it's not nearly that simple.

Splitting up one big network of users into small groups will dramatically reduce the network traffic for each system, but it also makes it impossible for a user in one group to share data with a user in another. If the work of different groups is clearly defined, then this method may work successfully, but usually it results in a reduction in the flexibility of the overall system.

Another solution is to split up the network into small groups connected by bridges. A bridge sits between two networks and, where appropriate, acts as a filter to stop traffic from one network going onto the other; but it will also allow for circumstances where users from different groups need to share data with each other.

This compromise solution will work up to a certain point, but if the total number

of users is continually increasing, then it would be better to invest in a more powerful network operating system.

### Network adaptors and protocols

In order to connect a PC to the network, you must first install a network adaptor. This goes inside the PC and controls the physical transmission of data over the LAN. The most common network adaptors are Ethernet, Token Ring and ARC-Net. The Ethernet variety can be directly cabled together using T connectors which fit to the jack at the back of the adaptor. All computers can then be connected by joining T connectors to each other.

Different network adaptors access the network in different ways and their raw data transmission speed varies. Token Ring, for example, waits for a special signal known as a "token" before transmitting, whereas Ethernet adaptors just wait until the network is clear. With Ethernet adaptors, two packets of data will periodically collide and both adaptors will time out for a random period.

This month's Beginners column has been based around WFW implemented as an independent peer-to-peer network. However, WFW can also be used in conjunction with Novell NetWare and other network operating systems. Because Windows is network-aware, it can detect the presence of the network and load the necessary support drivers.

In many ways WFW is a fundamentally flawed networking product. Although it provides network capabilities, it is not a fully fledged network operating system like Unix or Novell NetWare because it sits on top of DOS. This means that machines which have DOS but not Windows can only act as clients and not servers. Configuring security is not brilliant either and the range of access permissions is limited. But for small groups of users WFW offers a simple and cheap way of sharing resources.



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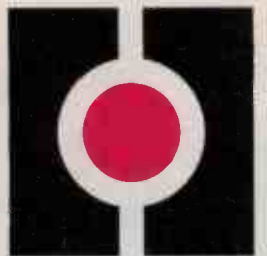
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| Lotus 1.2.3 V.5      | 4MB     | 8MB+        |
| MS Word V.6          | 4MB     | 8MB+        |
| MS Office V.4.3      | 4MB     | 8MB+        |
| MS Access V.4        | 6MB     | 8MB+        |
| MS Powerpoint        | 4MB     | 8MB+        |
| Norton Utilities V.8 | 4MB     | 8MB+        |
| Corel Draw 5         | 4MB     | 8MB+/16MB   |
| Aldus PageMaker 5    | 4MB     | 8MB+        |

Source: Manufacturers figures



## MEMORY LANE

Do you remember...?  
... Being saluted by an AA Patrolman  
... GPO Morris Minor Vans  
... Utility marks on furniture



# MEMORY



## WELCOME TO POWERMARK - Part 6

*I'm passionate about my company and I do feel that it is important that you know about the culture and ethos of the organisation that you are dealing with.*

*Mark Simon*

Mark Simon  
Chairman

We've moved - but for only one month!

Our range of new products and upgrades has grown so much that it has caught PCW by surprise. They could only squeeze us in at the back of this issue, but we'll be back to our regular slot, (just before Newsprint) next month.



## THE LARGEST DIRECT MEMORY SUPPLIER

Every month Powermark plc supply thousands of memory upgrades to thousands of satisfied customers, making us the largest direct supplier of memory in the UK.

*"Adding memory to your computer is undoubtedly the easiest, most cost effective way of increasing the performance of your system"*

More and more applications demand large amounts of memory to work effectively. By increasing the standard memory in your PC you can:

- Radically increase the performance of your system
- Run multimedia applications at optimum speed
- Keep fonts and desktop accessories in RAM for instant access
- Run more than one application at a time, enabling true multi-tasking

## DON'T JUST TAKE OUR WORD FOR IT...

*"There's no question that you need more memory to run Windows or OS/2 than you ever did to run DOS."*

The amount of memory made an even greater difference when we tried features like dragging and dropping between applications. The system was very slow with 4MB, significantly faster with 8MB, and faster still with 12MB.

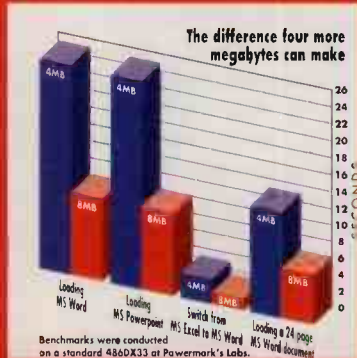
On the basis of our tests, 8MB - not 4MB - is the minimum amount of memory you'll need to run Windows 3.1 satisfactorily. With 12MB, you'll get optimal performance in many cases."

PC Magazine, February 1995

*"Possibly the greatest upgrade you can offer a flagging PC is an increase in memory."*

The difference in speed between 4MB and 8MB is enormous, as is the jump from 8MB to 16MB. Anyone attempting to run Windows 3.1 in less than 4MB should upgrade now."

Personal Computer World, January 1995



## MATCHED MEMORY SIMM KITS

If you're unsure about upgrading then our Matched Memory SIMM Kits are for you. They're guaranteed to be totally memory matched. That means speed, voltage, refresh, parity and physical characteristics are all matched to give optimum performance to your system.

From our listings on the following pages, just select the upgrade kit for your PC. They cost a little more but you get:

- full installation instructions
- anti-static wrist strap
- dedicated support hotline
- our famous double guarantee - full lifetime warranty and the Powermark Promise - our 14 day 'no-quibble' money back guarantee

If your PC is not listed then call us. Our Memory Database has the upgrade path for almost every PC supplied in the UK over the last five years.

## UPGRADING IS EASY

With most memory upgrades it's just a case of:

- switching off PC
- removing lid
- locating SIMM sockets
- installing SIMMs
- closing lid
- switching back on

## HANDLING MEMORY

Static can degrade a DRAM, shortening its life. That's why we include an anti-static wrist strap in every Matched Memory SIMM Kit. If you're buying loose SIMMs then do ask for an anti-wrist strap. For multiple installations we can supply complete ESD (electro static device) protection equipment.



## QUALITY, QUALITY, QUALITY

Being the largest direct supplier means we buy memory direct from world class manufacturers. Powermark never supply memory that is non-factory original.

## REGULAR SIMMS

### 30 PIN SIMMS

- 5 year warranty on all SIMMs listed here

| Type         | Capacity | Speed     |
|--------------|----------|-----------|
| 256K x 9     | 256K     | 100ns £12 |
| 256K x 9     | 256K     | 80ns £12  |
| 1M x 8       | 1MB      | 80ns £33  |
| 1M x 9       | 1MB      | 80ns £33  |
| 1M x 9       | 1MB      | 70ns £29  |
| 1M x 9 (9cs) | 1MB      | 70ns £33  |
| 1M x 9       | 1MB      | 60ns £36  |
| 4M x 8       | 4MB      | 80ns £125 |
| 4M x 9       | 4MB      | 80ns £128 |
| 4M x 9       | 4MB      | 70ns £115 |
| 4M x 9       | 4MB      | 60ns £121 |
| 16M x 9      | 16MB     | 70ns £579 |
| 16M x 9      | 16MB     | 60ns £599 |

### GOLD EDGED SIMMS

- Specified by many PC manufacturers
- Longer MTBF

|        |     |      |     |
|--------|-----|------|-----|
| 1M x 9 | 1MB | 70ns | £41 |
| 1M x 9 | 1MB | 60ns | £45 |

### 72 PIN SIMMS

- 10 year warranty on all SIMMs listed here

| Type      | Capacity | Speed      |
|-----------|----------|------------|
| 256K x 36 | 1MB      | 80ns £59   |
| 256K x 36 | 1MB      | 70ns £59   |
| 512K x 32 | 2MB      | 70ns £75   |
| 512K x 36 | 2MB      | 70ns £75   |
| 1MB x 32  | 4MB      | 80ns £122  |
| 1MB x 32  | 4MB      | 70ns £125  |
| 1MB x 36  | 4MB      | 80ns £135  |
| 1MB x 36  | 4MB      | 70ns £135  |
| 1MB x 36  | 4MB      | 60ns £145  |
| 2MB x 32  | 8MB      | 80ns £265  |
| 2MB x 32  | 8MB      | 70ns £255  |
| 2MB x 36  | 8MB      | 80ns £265  |
| 2MB x 36  | 8MB      | 70ns £255  |
| 2MB x 36  | 8MB      | 60ns £279  |
| 4MB x 32  | 16MB     | 70ns £479  |
| 4MB x 36  | 16MB     | 70ns £479  |
| 4MB x 36  | 16MB     | 60ns £529  |
| 8MB x 32  | 32MB     | 70ns £899  |
| 8MB x 36  | 32MB     | 70ns £899  |
| 8MB x 36  | 32MB     | 60ns £1049 |
| 16MB x 36 | 64MB     | 60ns £Call |

**PRICE INSTABILITY!**  
CALL FOR LATEST OFFERS ON MEMORY BEFORE ORDERING

**POWER  
THE NET!**



Access the Internet through Powermark's PNet

- Full Internet connection • POP3 Email • Worldwide Web Browsing
- FTP • Telnet • Usenet • Many local points of presence
- On-line or telephone support • Free Internet guide



# BANK at Powermark



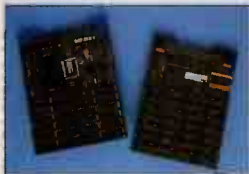
## MATCHED MEMORY FEATURE

### MATCHED MEMORY FOR COMPAQ

**COMPAQ**

ASSOCIATE

|   |                       |
|---|-----------------------|
| <b>DESKPRO 386/20/25/e/s</b>                        |                       |
| 4MB add-on  |                       |
| Module  | <b>POWERCUT!</b> £159 |
| 4MB Expansion                                       |                       |
| Board   | <b>POWERCUT!</b> £209 |
| <b>SYSTEMPRO, DESKPRO 486/33L, 50L &amp; 486/25</b> |                       |
| 8MB Module  | £299                  |
| 32MB Module   | £1444                 |
| <b>SYSTEMPRO XL 486/50, PENTIUM</b>                 |                       |
| 256MB Board with 16MB                               | £799                  |
| <b>DESKPRO 386N, 386S/20 &amp; PROSIGNIA</b>        |                       |
| 2MB Module  | <b>POWERCUT!</b> £85  |
| 4MB Module  | <b>POWERCUT!</b> £145 |
| <b>DESKPRO 386A/486, 486/25M, 486S/33M, 486DX2</b>  |                       |
| 64MB Board with 4MB                                 | £292                  |
| 64MB Board with 8MB                                 | £444                  |
| <b>DESKPRO XE &amp; XL FAMILY</b>                   |                       |
| 4MB   | £167                  |
| 8MB   | £325                  |
| <b>DESKPRO DESKPRO 5/90</b>                         |                       |
| 8MB Module  | £269                  |
| <b>PROLINEA 4/25S, 4/33, 4/50, 4/66, NET 1, MT</b>  |                       |
| 4MB   | <b>POWERCUT!</b> £145 |
| 8MB   | £299                  |



|  |                       |
|--|-----------------------|
| <b>PROLIANT 1000, 2000, 4000</b>               |                       |
| 4MB  | £168                  |
| 8MB  | £336                  |
| 16MB   | £639                  |
| <b>PORTABLE 486M/COLOUR</b>                    |                       |
| 2MB Kit  | £87                   |
| 8MB Kit  | £310                  |
| <b>SLT386</b>                                  |                       |
| 2MB Board                                      | £129                  |
| 4MB Board                                      | £189                  |
| <b>LTE LITE 386, 386s/20</b>                   |                       |
| 2MB Board                                      | £129                  |
| 4MB Board                                      | £189                  |
| 8MB Board                                      | £349                  |
| <b>LTE LITE 486C</b>                           |                       |
| 4MB Card                                       | £189                  |
| 8MB Card                                       | £349                  |
| 16MB Card                                      | £773                  |
| <b>LTE ELITE SERIES</b>                        |                       |
| 4MB Card                                       | £185                  |
| 8MB Card                                       | £349                  |
| <b>CONTURA 400 C/CX</b>                        |                       |
| 8MB Module                                     | <b>POWERCUT!</b> £285 |
| <b>CONTURA 3/25/20/25C, 4/25</b>               |                       |
| 2MB Card                                       | £85                   |
| 4MB Card                                       | £159                  |
| 8MB Card                                       | £299                  |
| <b>CONCERTO 4/25, 4/33</b>                     |                       |
| 8MB  | £389                  |
| 16MB   | £1215                 |
| <b>COMPAQ PRESARIO 425, 633, 833, 850, 866</b> |                       |
| 4MB  | £149                  |
| 8MB  | £279                  |
| <b>COMPAQ PRESARIO 700/900</b>                 |                       |
| 16MB Module                                    | £499                  |

### MATCHED MEMORY FOR DELL

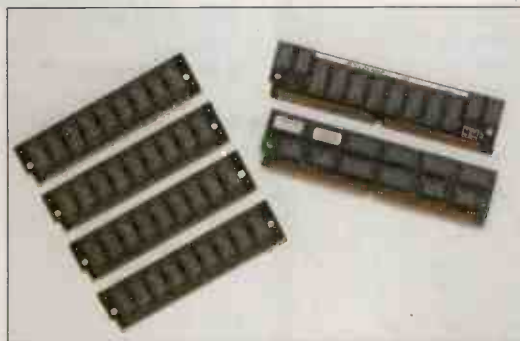
|                                  |                       |
|----------------------------------|-----------------------|
| <b>200 / 300 SERIES</b>          |                       |
| 2MB Kit                          | £64                   |
| 4MB Kit                          | £129                  |
| <b>325/D/P, 333/D/P</b>          |                       |
| 2MB → 6MB                        | £129                  |
| 2MB → 10MB                       | £289                  |
| <b>POWERLINE</b>                 |                       |
| <b>WORKSTATION SERIES</b>        |                       |
| 4MB Kit                          | £189                  |
| 8MB Kit                          | £336                  |
| 16MB Kit                         | <b>POWERCUT!</b> £495 |
| <b>POWER DESKTOP SERIES</b>      |                       |
| 4MB Module                       | <b>POWERCUT!</b> £149 |
| 8MB Module                       | £299                  |
| <b>LOW PROFILE POWER DESKTOP</b> |                       |
| 4MB                              | £139                  |
| 16MB                             | <b>POWERCUT!</b> £495 |
| <b>NI20, NI25</b>                |                       |
| 2MB Module                       | £114                  |
| <b>320SLI</b>                    |                       |
| 1MB                              | £149                  |
| <b>DIMENSION 'I'</b>             |                       |
| 4MB                              | £149                  |
| 8MB                              | £289                  |
| <b>DIMENSION XPS</b>             |                       |
| 16MB Kit                         | £559                  |
| <b>OMNIPLEX SERIES</b>           |                       |
| 16MB Module                      | <b>POWERCUT!</b> £479 |
| <b>LATITUDE SERIES/M</b>         |                       |
| 4MB                              | <b>POWERCUT!</b> £149 |
| 16MB                             | £495                  |

### MATCHED MEMORY FOR SHARP

|                              |      |
|------------------------------|------|
| <b>SHARP 3000/3100, 6700</b> |      |
| 512K                         | £89  |
| 1MB                          | £149 |
| <b>SHARP 6220/6221</b>       |      |
| 1MB                          | £88  |
| 2MB                          | £168 |
| <b>SHARP 6641, 8501</b>      |      |
| 1MB                          | £94  |
| 2MB                          | £146 |

### PCMCIA MEMORY

|  |      |
|--|------|
| • All formats stocked: JEDEC, FLASH, OTPROM, DRAM, etc |      |
| • Check compatibility before ordering                  |      |
| 256K SRAM  | £48  |
| 512K SRAM  | £74  |
| 1MB SRAM   | £122 |
| 2MB SRAM   | £139 |



### MATCHED MEMORY FOR NOTEBOOKS & PALMTOPS

|  |                       |
|--|-----------------------|
| • More memory can increase battery life by up to 18% |                       |
| <b>COMMODORE LT286/386</b>                           |                       |
| 2MB Module   | <b>POWERCUT!</b> £83  |
| 4MB Kit  | <b>POWERCUT!</b> £169 |
| <b>SANYO 17NB, 18NB</b>                              |                       |
| 2MB  | <b>POWERCUT!</b> £82  |
| 4MB  | <b>POWERCUT!</b> £165 |
| <b>PANASONIC CF170, 270, 370</b>                     |                       |
| 1MB  | £69                   |
| 2MB  | £129                  |
| <b>PANASONIC CF280, 380, 480</b>                     |                       |
| 2MB  | £130                  |
| 6MB  | £320                  |
| <b>CF1000</b>  |                       |
| 4MB Module   | £198                  |
| <b>CF580</b>   |                       |
| 4MB Module   | £185                  |
| <b>LIBREX V386SX</b>                                 |                       |
| 1MB → 4MB  | <b>POWERCUT!</b> £199 |
| <b>POQET</b>   |                       |
| 256K   | £58                   |

**BSI**  
REGISTERED FIRM

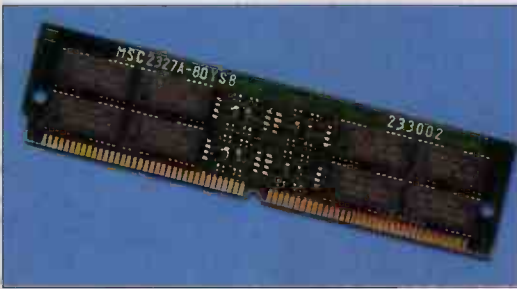
**NATIONAL ACCREDITATION OF CERTIFICATION BODIES**

Certificate no. FS 26535

BS5750 registered for the supply of computer, printer and workstation memory, processor and other upgrades.

Powermark plc is regularly assessed by the British Standards Institution to ensure compliance with the quality standard.

**Technical Sales Order Lines**  
**0181-951 3355**  
(50 lines)



### MEMORY TOOLS

|  |      |
|--|------|
| • Complete range of anti-static products available |      |
| <b>ANTI-STATIC WRIST STRAP</b>                     |      |
| • Essential when handling electrostatic devices    | £8   |
| <b>IC EXTRACTOR TOOL</b>                           | £9   |
| <b>SIMM TESTER</b>                                 | £779 |
| <b>WRIST STRAP TESTER</b>                          | £99  |

### LIFETIME WARRANTY ON ALL MATCHED MEMORY

### WE ALSO SUPPLY UPGRADES FOR...

Acorn, ALK, AST, Austin, Canon, Commodore, Dan, Goldstar, Hyundai, Locland, MJN, Multiplex, NEC, NeXT, Opus, Philips, QMS, Sharp, Tandy, TI, Unisys, Wyse and many more.

|   |        |
|---|--------|
| <b>DRAMS</b>                                  |        |
| • Call for devices not shown                  |        |
| • Full range of PROMs, SRAMs & ZIPs available |        |
| • 5 year warranty                             |        |
| 64K x 1 - 120ns                               | £1.79  |
| 256K x 1 - 100ns                              | £2.62  |
| 256K x 1 - 80ns                               | £2.80  |
| 256K x 4 - 80ns                               | £5.77  |
| 1M x 1 - 80ns                                 | £4.99  |
| 1M x 1 - 70ns                                 | £5.20  |
| 1M x 4 - 80ns                                 | £17.80 |

### EARLY BIRD

**Order Bonus**  
See page 29 of this advertisement

**HMSO**  
Public Sector customers can purchase through HMSO by calling 01603 694153.

**BEWARE**  
Beware of third party, low grade memory. Powermark plc only supply premium upgrades from market leaders with manufacturer's approvals.

**Technical Sales Order Lines**  
**0181-951 3355**  
(50 lines)

**MEMORY**

**HUGE STOCKS**  
Guaranteed same day despatch on virtually all orders placed even up to 5.00pm.

**TECHNICAL SALES PEOPLE**  
Our sales people are the best. They are trained specialists in their chosen field - multimedia, memory of all types, mass storage, networking and communications.

**FINANCIAL STABILITY**  
Powermark plc has been supplying upgrades for over 4 years and has an annual turnover exceeding £17 million with a healthy balance sheet.

**LOW PRICES**  
We only supply products from leading manufacturers and at low, low prices too.

**TECHNICAL SUPPORT**  
Dedicated after sales technical support teams on line to help with installation.

**CORPORATE & PUBLIC SECTOR**  
We welcome orders from corporate, education and public sector organisations. Just fax or phone your order number.

**FULL MANUFACTURERS' WARRANTIES**  
All products supplied by Powermark plc carry manufacturers' warranties and of course full Powermark plc guarantees.

**TURN THE PAGE FOR MORE**

**UPGRADE DRIVE THRU**  
While you wait installation service available. See page 3 for details.

**PERSONAL CALLERS**  
Save on delivery charges - there's plenty of parking. Telephone first to check our stock position on the items you want. We're open from 9.00am to 6.00pm Monday to Friday. Saturdays: Sales from 9.30am to 4.00pm. Technical Support and Customer Service from 10.00am to 2.00pm.

**Powermark plc**  
Premier House, 112 Station Rd, Edgware, Middlesex HA8 7AQ  
**Tel: 0181-951 3355**  
(50 lines)  
Fax: 0181 905 6233  
Email: sales@powermark.com

**POWER THE NET!**

**RATES** £12.50 once-only membership  
£15 per month subscription  
ABSOLUTELY NO OTHER HIDDEN SERVICE CHARGES  
Quit at any time without penalties

Call 0181-951-3355 and ask for our PNet specialists

Join for only £9.95 when you buy any modem from Powermark

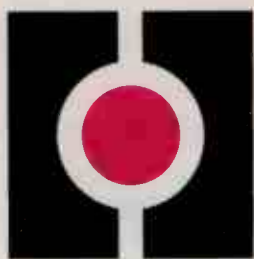
VISA MasterCard J SWITCH

Cards are not debited until despatch  
VAT at 17.5% will be added to all prices

**2**



# Power



## Mark®

**Technical Sales  
Order Lines  
0181-  
951 3355  
(50 lines)**

**UPGRADE  
DRIVE THRU**

*Unsure  
about upgrading?*

Upgrading is easy but if you would like us to upgrade your computer then our **UPGRADE DRIVE THRU** is for you. It's fast, it's simple and it's convenient. Just drive into our loading bay at the rear of Premier House and your computer will go directly to our on-site labs for instant upgrading by our fully qualified engineers. For upgrades that take a little while we'll even hand you a Pager enabling you to visit the shopping centre next door. You'll be paged the minute your computer is ready.

In most cases you need only bring your base unit along, but do call first to discuss your requirements and to confirm our stock position on the upgrades you require.

### DESKTOP MENU

(Call for notebook menu)

|                        |     |
|------------------------|-----|
| Memory                 | £27 |
| Hard Disk              | £39 |
| Processor              | £28 |
| Tape Backup            | £31 |
| Sound or Modem Card    | £25 |
| Graphics or Video Card | £26 |
| Multimedia Kit         | £39 |

**Save £££s with**

**TURN THE PAGE  
FOR MORE**

# MEMORY

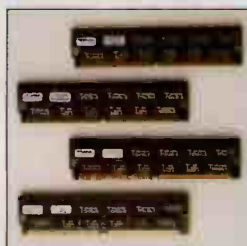


## MATCHED MEMORY FEATURE

### MATCHED MEMORY FOR AMSTRAD

|                             |                       |
|-----------------------------|-----------------------|
| PC1286/PC1386/PC3286/       |                       |
| PC3386/PC5286               |                       |
| 1MB → 4MB                   | £132                  |
| ALT286/386SX                |                       |
| 1MB → 4MB                   | £149                  |
| 1MB → 4MB (Zero-wait state) | £199                  |
| NC100                       |                       |
| 256K Card                   | £58                   |
| 512K Card                   | £89                   |
| 1MB Card                    | £129                  |
| PC7286, 7386                |                       |
| 2MB                         | <b>POWERCUT!</b> £62  |
| 4MB                         | <b>POWERCUT!</b> £129 |
| PC7486 SLC                  |                       |
| 8MB Kit                     | £229                  |
| 16MB Kit                    | <b>POWERCUT!</b> £459 |
| PC9486                      |                       |
| 4MB Module                  | <b>POWERCUT!</b> £139 |
| 16MB Module                 | <b>POWERCUT!</b> £495 |
| ANB386SX                    |                       |
| 4MB Module                  | <b>POWERCUT!</b> £185 |
| 386SX25                     |                       |
| MEGA PC                     |                       |
| 4MB Kit                     | £139                  |
| 16MB Kit                    | £469                  |

**All our Matched  
Memory Kits come  
with our famous  
double guarantee  
- full lifetime  
warranty and  
14 day money  
back guarantee**



### MATCHED MEMORY FOR TANDON

|   |                       |
|---|-----------------------|
| PC 386/20   |                       |
| 8MB Kit   | £336                  |
| PC386SX/20  |                       |
| 4MB Kit   | <b>POWERCUT!</b> £129 |
| 6MB Kit   | £219                  |
| 386SX NOTEBOOK                                    |                       |
| 2MB → 4MB   | £72                   |
| 2MB → 10MB  | £289                  |
| POSITIVE 386SX25,<br>386DX40, 486SX25,<br>486DX33 |                       |
| 4MB Kit   | <b>POWERCUT!</b> £129 |
| 16MB Kit  | £449                  |

### MATCHED MEMORY FOR PACKARD BELL

|                  |                       |
|------------------|-----------------------|
| LEGEND 200/316SX |                       |
| 2MB Kit          | <b>POWERCUT!</b> £72  |
| 4MB Kit          | <b>POWERCUT!</b> £144 |
| LEGEND 600, 900  |                       |
| 4MB Kit          | <b>POWERCUT!</b> £129 |
| 8MB Kit          | <b>POWERCUT!</b> £279 |
| 486 LOCAL BUS    |                       |
| 2MB Module       | £85                   |
| 4MB Module       | £149                  |
| FORCE RANGE      | £Call                 |
| XL410/416/486    |                       |
| 16MB Kit         | <b>POWERCUT!</b> £459 |

### MATCHED MEMORY FOR HP

|                                       |       |
|---------------------------------------|-------|
| • Authorised HP dealer                |       |
| VECTRA 386/25 PC,<br>486 PC, 486s/20  |       |
| 4MB Kit                               | £169  |
| 8MB Kit                               | £336  |
| HP VALUELINE 486,<br>NETSERVER SERIES |       |
| 8MB                                   | £299  |
| 16MB Module                           | £599  |
| HP95                                  |       |
| 512K Card                             | £89   |
| 1MB Card                              | £149  |
| HP OMNIBOOK RANGE                     | £Call |

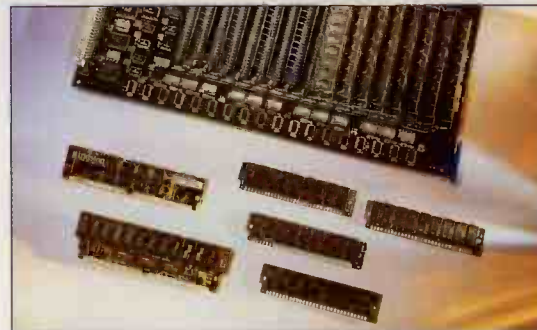
### MATCHED MEMORY FOR OLIVETTI

|                           |                       |
|---------------------------|-----------------------|
| PCS386SX                  |                       |
| 1MB → 2MB                 | <b>POWERCUT!</b> £64  |
| 1MB → 4MB                 | <b>POWERCUT!</b> £129 |
| 1MB → 6MB                 | <b>POWERCUT!</b> £209 |
| 1MB → 8MB                 | £272                  |
| PCS40                     |                       |
| 8MB Kit                   | £336                  |
| M290                      |                       |
| 2MB Kit                   | <b>POWERCUT!</b> £74  |
| 4MB Kit                   | <b>POWERCUT!</b> £149 |
| M486/CP386                |                       |
| 2MB Kit                   | £99                   |
| 4MB Kit                   | £168                  |
| PCS33                     |                       |
| 2MB Kit                   | <b>POWERCUT!</b> £66  |
| M300-30                   |                       |
| 4MB Kit                   | £168                  |
| 8MB Kit                   | £299                  |
| M400-10/40/60, M480-10/20 |                       |
| 4MB Kit                   | £156                  |
| 16MB Kit                  | £539                  |
| QUADERNO                  |                       |
| 512K                      | £89                   |
| 1MB Kit                   | £149                  |
| MODULO & SUPREMA<br>RANGE |                       |
| 8MB Module                | £289                  |
| 16MB Module               | £529                  |
| 32MB Module               | £1199                 |



### BEWARE

Beware of low grade 5 volt notebook memory that reduces battery life by up to 40%. Powermark plc only supplies 3.3 volt devices from market leaders with manufacturers' approvals.



### MATCHED MEMORY FOR TOSHIBA

|   |      |
|---|------|
| T1000/E/XE/LE, T1800,<br>T1850C, T2000SX,<br>T2000SXE, T2200SXE |      |
| 2MB Card  | £89  |
| 4MB Card  | £162 |
| 8MB Card  | £299 |
| T3300SL   |      |
| 2MB   | £66  |
| T1200XE   |      |
| 2MB Card  | £93  |
| T1600/T5100   |      |
| 2MB Card  | £75  |
| T2400CS/T3600   |      |
| 16MB  | £649 |
| T3100SX   |      |
| 2MB Card  | £89  |
| 4MB Card  | £162 |
| T3200SX/C   |      |
| 2MB Module  | £89  |
| 4MB Module  | £162 |
| 8MB Kit   | £299 |
| T3200   |      |
| 3MB Card  | £169 |
| T4400, T6400 SX/C, DX/C   |      |
| 4MB Card  | £169 |
| 8MB Card  | £299 |
| T1950CT, T3400CT, T4500,<br>T4600, T4700CT, T4800CT             |      |
| 8MB Module  | £329 |
| 16MB Module   | £629 |
| T4850/4900  |      |
| 8MB   | £299 |
| T5200/C & T8500/<br>6400/6600                                   |      |
| 2MB Module  | £94  |
| 8MB Module  | £349 |
| DYNAPAD T100X   |      |
| 6MB Card  | £269 |

### MATCHED MEMORY FOR ZENITH

|                                  |      |
|----------------------------------|------|
| SUPERSPORT SX                    |      |
| 2MB Module                       | £127 |
| TURBOSPORT 386E                  |      |
| 2MB Kit                          | £424 |
| MASTERSPORT SL/SLC, 620NL        |      |
| 2MB Module                       | £109 |
| Z-NOTE L SERIES, 320, 325        |      |
| 1MB                              | £114 |
| 2MB                              | £408 |
| Z-SERVER/STATION/<br>425/433/450 |      |
| 8MB Module                       | £279 |
| Z-SPORT                          |      |
| 4MB                              | £179 |

### MATCHED MEMORY FOR GATEWAY

|                        |       |
|------------------------|-------|
| PC 4SX-33              |       |
| 4MB Module             | £129  |
| 16MB Module            | £499  |
| PC 4DX-33V, PC 4DX-66V |       |
| 4MB Module             | £129  |
| 16MB Module            | £499  |
| 32MB Module            | £1199 |
| PC 4DX2-66P/V          |       |
| 16MB Module            | £499  |
| 32MB Module            | £1199 |
| PC P5-60, P5-66        |       |
| 64MB Kit               | £2622 |
| PC 4D-66, PC 4D-100    |       |
| 8MB Kit                | £299  |
| 32MB Kit               | £1199 |

### MATCHED MEMORY FOR ELONEX

|                             |                       |
|-----------------------------|-----------------------|
| PC386SXM, SXB, 386/16, B/33 |                       |
| 2MB Kit                     | £64                   |
| 4MB Kit                     | £119                  |
| 8MB Kit                     | £249                  |
| PC386 V/E, 486 V/E          |                       |
| 4MB Kit                     | £139                  |
| 8MB Kit                     | £279                  |
| 16MB Kit                    | £469                  |
| WS RANGE                    |                       |
| 4MB Kit                     | <b>POWERCUT!</b> £139 |
| 8MB Kit                     | <b>POWERCUT!</b> £279 |
| 16MB Kit                    | <b>POWERCUT!</b> £499 |
| PC433M, 450M, 466M          |                       |
| 4MB Kit                     | £122                  |
| 8MB Kit                     | £279                  |
| 16MB Kit                    | £469                  |
| LT386SX/P                   |                       |
| 2MB Kit                     | £64                   |
| 4MB Kit                     | £139                  |
| PC500 SERIES                |                       |
| 8MB Module                  | <b>POWERCUT!</b> £279 |
| 16MB Module                 | <b>POWERCUT!</b> £469 |
| ELONEX 560F EISA            |                       |
| 8MB Kit                     | <b>POWERCUT!</b> £279 |
| 16MB Kit                    | <b>POWERCUT!</b> £475 |

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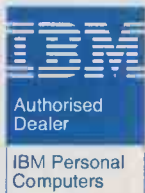
**POWER  
THE NET!**







## MATCHED MEMORY FOR IBM



- Planar memory plugs directly onto system board
- Price instability - check latest offers on IBM matched memory before ordering

|  |                       |
|--|-----------------------|
| <b>PS/2 35LS, 35SX, 40SX</b>                                 |                       |
| 4MB  | £159                  |
| 8MB  | £299                  |
| <b>PS/2 50Z</b>  |                       |
| 1MB → 2MB  | £85                   |
| <b>PS/2 55SX, 60, 65SX/57SX/M57</b>                          |                       |
| 4MB  | £168                  |
| <b>PS/2 70, Portable 70/75</b>                               |                       |
| 4MB  | <b>POWERCUT!</b> £159 |
| 8MB  | £289                  |
| <b>PS/2 80</b>   |                       |
| 4MB  | £239                  |
| <b>PS/2 140SX, N335SX, NSL</b>                               |                       |
| 4MB Card   | <b>POWERCUT!</b> £149 |
| 8MB Card   | £349                  |
| <b>PS/2 90, 95, 95A</b>                                      |                       |
| 4MB Module   | £168                  |
| <b>PS/2 195 &amp; 295</b>                                    |                       |
| 32MB Module  | £Call                 |
| <b>VALUEPOINT 6381, 6382, 6384</b>                           |                       |
| 4MB  | £139                  |
| 8MB  | <b>POWERCUT!</b> £269 |
| <b>PENTIUM VALUEPOINT SERIES</b>                             |                       |
| 8MB Kit  | <b>POWERCUT!</b> £289 |
| 16MB Kit   | £549                  |
| <b>THINKPAD 300, 350, 355, 500, 700, 710, 720, 750, 755c</b> |                       |
| 2MB  | £179                  |
| 8MB  | £349                  |
| <b>PC466DX2, 100DX4</b>                                      |                       |
| 8MB Module   | £299                  |
| <b>CL57SX</b>  |                       |
| 4MB  | £189                  |
| 8MB  | £383                  |
| <b>TREKKA</b>  |                       |
| 2MB  | £89                   |
| <b>HURDLA, SPRINTA</b>                                       |                       |
| 4MB Kit  | £149                  |
| 16MB Kit   | £476                  |
| <b>PS/1</b>  |                       |
| 2MB  | £85                   |
| <b>PS/1 - 386</b>  |                       |
| 4MB  | £149                  |
| <b>PS/1 - PRO 486</b>  |                       |
| 4MB  | £149                  |
| 8MB  | £289                  |
| <b>CONSULTANT, ESSENTIAL, EXPERT</b>                         |                       |
| 4MB  | £149                  |
| 8MB  | £279                  |
| <b>NEW! APTIVA</b>   |                       |
| 4MB  | £149                  |
| <b>PC 300 SERIES</b>   |                       |
| 4MB Module   | £149                  |
| <b>PC 700 SERIES</b>   |                       |
| 8MB Module   | £279                  |

## MATCHED MEMORY FEATURE

### MATHS CO-PROCESSORS

Installation of a Co-Processor results in a significant speed increase in maths intensive applications eg: spreadsheets, databases, CAD and graphics packages.

|                           | INTEL | ULSI | ITT/ CYRIX           |
|---------------------------|-------|------|----------------------|
| 80387 SX (16 MHz → 33MHz) | £58   | £49  | <b>POWERCUT!</b> £42 |
| 80387 SX (40 MHz)         | £58   | -    | £48                  |
| 80387 SL (25 MHz)         | £58   | -    | -                    |
| 80387 DX (16 MHz → 33MHz) | £59   | £32  | <b>POWERCUT!</b> £49 |
| 80387 DX (40 MHz)         | -     | -    | £51                  |
| 80487 SX (25 MHz)         | £277  | -    | -                    |
| 80386 RapidCAD            | £189  | -    | -                    |



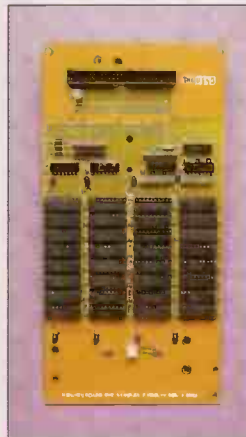
### MATCHED ADAPTER BOARDS FOR IBM PS/2

- Completely user expandable
- PS/2 50, 50Z, 60 & 65
- 16MB Board with 4MB £295
- 16MB Board with 8MB £425
- PS/2 70, 80, 90 & 95
- 64MB Board with 4MB £295
- 64MB Board with 8MB £465

### MATCHED MEMORY FOR VIGLEN

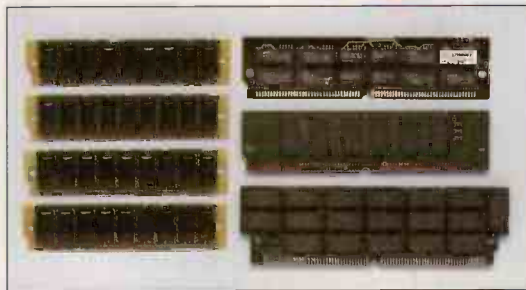
- Complete range for Executive, Professional and Tower

|  |       |
|--|-------|
| <b>GENIE 386SX</b>                               |       |
| 2MB Kit  | £64   |
| 4MB Kit  | £128  |
| <b>VIG II ELITE</b>                              |       |
| 2MB Kit  | £98   |
| 4MB Kit  | £196  |
| <b>VIG III LS (Type 1)</b>                       |       |
| 4MB Kit  | £169  |
| 8MB Kit  | £399  |
| <b>VIG III/25, III/33</b>                        |       |
| 4MB Kit  | £139  |
| 8MB Kit  | £279  |
| 16MB Kit   | £469  |
| <b>VIGLEN EX PENTIUM SERIES</b>                  |       |
| 8MB Kit  | £269  |
| <b>VIGLEN EX 4DX33/50</b>                        |       |
| 4MB  | £139  |
| 8MB  | £269  |
| <b>VIG 4SX25, 4DX33, 4DX50, 4DX2-50, 4DX2-66</b> |       |
| 4MB Kit  | £139  |
| 8MB Kit  | £279  |
| 16MB Kit   | £499  |
| <b>CONTENDER RANGE</b>                           |       |
| 4MB  | £149  |
| 8MB  | £269  |
| <b>GENIE 486VLB RANGE</b>                        |       |
| 16MB Module                                      | £499  |
| 64MB Kit   | £2396 |
| <b>GENIE PCI RANGE</b>                           |       |
| 16MB Module                                      | £499  |
| 32MB Module                                      | £1199 |



### MATCHED MEMORY FOR ICL

|                           |                       |
|---------------------------|-----------------------|
| <b>DRS 40, 45</b>         |                       |
| 2MB Kit                   | £69                   |
| 4MB Kit                   | £155                  |
| <b>ERGOPRO C4, D4</b>     |                       |
| 8MB Kit                   | £149                  |
| 16MB Kit                  | £539                  |
| <b>DRS M95</b>            |                       |
| 4MB Kit                   | <b>POWERCUT!</b> £179 |
| 32MB Kit                  | £1199                 |
| <b>VALUEPLUS DL RANGE</b> |                       |
| 4MB                       | £168                  |
| <b>ZENO SERIES</b>        |                       |
| 4MB Kit                   | £149                  |
| 16MB Kit                  | £539                  |



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Powermark plc is regularly assessed by the British Standards Institution to ensure compliance with the quality standard.

### MATCHED MEMORY FOR APRICOT

|   |      |
|---|------|
| <b>XEN 486SX-25, 486DX2-50, 486 DX2-66, PCM</b> |      |
| 4MB Module                                      | £168 |
| 16MB Module                                     | £599 |

### EARLY BIRD

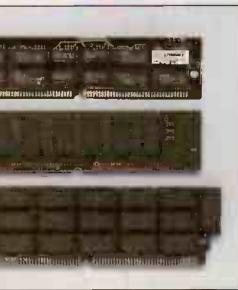


### MEMORY EXPANSION BOARDS

|                           |      |
|---------------------------|------|
| <b>KINGSTON ATA BOARD</b> |      |
| 16MB Board with 4MB       | £239 |
| 16MB Board with 8MB       | £349 |
| 16MB Board with 16MB      | £649 |

### MATCHED MEMORY FOR APPLE

|                        |  |
|------------------------|--|
| Complete range stocked |  |
| Authorised Reseller    |  |



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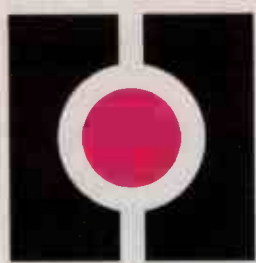
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## MATCHED MEMORY FOR IBM PRINTERS



|                             |       |
|-----------------------------|-------|
| <b>IBM 4019 &amp; 4019E</b> |       |
| 1MB                         | £49   |
| 2MB                         | £119  |
| <b>IBM 4029</b>             |       |
| 2MB                         | £114  |
| <b>IBM 4039 &amp; 4079</b>  |       |
| 4MB                         | £221  |
| 8MB                         | £418  |
| <b>LEXMARK RANGE</b>        | £Call |



**TURN THE PAGE  
FOR MORE**

## MEMORY QUIZ

??????  
"Your starter for 10MB"

- What was different about the Chopper Sprint GT?
- Name the three principle puppets in Rainbow
- Could you buy the Acorn Atom in kit form?

Answers on fax form page



## MATCHED LASERPRINTER MEMORY

• Price instability - check latest offers on laser printer memory before ordering

|   |                |
|---|----------------|
| <b>BROTHER HL4</b>                      |                |
| 1MB                                     | £79            |
| 4MB                                     | £199           |
| <b>BROTHER HL8/E/V,<br/>HL10, DPS</b>   |                |
| 1MB                                     | £79            |
| 2MB                                     | £129           |
| <b>CANON</b>                            |                |
| <b>NOTEJET 486, BN22</b>                |                |
| 4MB Module                              | £149           |
| <b>CANON LBP4, 4+, LITE, SX</b>         |                |
| 1MB                                     | £85            |
| 2MB                                     | £159           |
| <b>CANON LBP8II</b>                     |                |
| 2MB                                     | £109           |
| 4MB                                     | £189           |
| <b>CANON LBP8IV</b>                     |                |
| 4MB                                     | £144           |
| <b>COMPAQ PAGEMARQ 15/20</b>            |                |
| 2MB                                     | £96            |
| 8MB                                     | £299           |
| 16MB                                    | £599           |
| <b>EPSON EPL4000/4100/4300</b>          |                |
| 1MB                                     | £62            |
| 2MB                                     | £109           |
| <b>EPSON EPL8100</b>                    |                |
| 1MB                                     | £62            |
| 2MB                                     | £109           |
| <b>KYOCERA F800</b>                     |                |
| 1MB                                     | £82            |
| 2MB                                     | £129           |
| <b>KYOCERA F1800</b>                    |                |
| 1MB                                     | £94            |
| <b>KYOCERA F1200S/3000/3300</b>         |                |
| 1MB                                     | £94            |
| 4MB                                     | £199           |
| <b>KYOCERA ECOSYS</b>                   | £Call          |
| <b>KYOCERA F3500A, 5500A</b>            |                |
| 1MB                                     | £59            |
| <b>MANNESMAN TALLY</b>                  |                |
| <b>MT904/908</b>                        |                |
| 1MB                                     | £69            |
| <b>MANNESMAN TALLY MT905</b>            |                |
| 2MB                                     | £129           |
| 4MB                                     | £189           |
| <b>OKI LASER 400</b>                    |                |
| 1MB                                     | £72            |
| 2MB                                     | £109           |
| <b>OKI LASER 400e, 400ex,<br/>410ex</b> |                |
| 1MB                                     | £119           |
| <b>OKI LASER 830/840/850</b>            |                |
| 2MB                                     | £129           |
| <b>PANASONIC 4420</b>                   |                |
| 1MB                                     | £72            |
| 2MB                                     | £109           |
| <b>PANASONIC 4430</b>                   |                |
| 1MB                                     | £89            |
| <b>PANASONIC 5410, 4440</b>             |                |
| 2MB                                     | £117           |
| <b>PANASONIC 4450i</b>                  |                |
| 2MB                                     | POWERCUT! £99  |
| 4MB                                     | POWERCUT! £165 |
| <b>SHARP JX-9500PS</b>                  |                |
| 1MB                                     | £68            |
| <b>STAR LP4/LP8</b>                     |                |
| 1MB                                     | £89            |
| 2MB                                     | £129           |
| <b>TEXAS MICROLASER PS</b>              |                |
| 2MB                                     | £109           |
| <b>TOSHIBA PAGELASER 6</b>              |                |
| 1MB                                     | £119           |



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## MATCHED MEMORY FEATURE

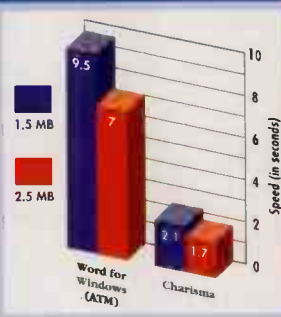
### LASER PRINTER MEMORY - AN EXPLANATION

Increasing memory in your laser printer will enable it to print large, graphics intensive documents. Additional benefits include faster print spooling, faster printing speed and multiple font downloading.

This chart shows the improvement a single megabyte of printer memory can make. "Speed" represents the amount of time required to spool the document into the printer and get the full use of your PC back.

How much memory do you need?

|                      |           |                         |     |
|----------------------|-----------|-------------------------|-----|
| Full page graphics   | 1MB - 2MB | 4 - 5 PostScript fonts  | 2MB |
| Soft fonts           | 1MB       | 8 - 10 PostScript fonts | 4MB |
| PostScript cartridge | 1.5MB     | Network printer sharing | 4MB |



## MATCHED MEMORY FOR HP PRINTERS



HEWLETT  
PACKARD

Authorised reseller

### LASERJET II, IID

|     |               |
|-----|---------------|
| 2MB | POWERCUT! £89 |
| 4MB | £159          |

### LASERJET IIP, III, IID, IIP

|     |               |
|-----|---------------|
| 2MB | POWERCUT! £82 |
| 4MB | £149          |

### LASERJET IIIsi, 4, 4M,

|          |      |
|----------|------|
| 4si, 4MV |      |
| 4MB      | £149 |

### LASERJET 4L

|     |     |
|-----|-----|
| 1MB | £79 |
|-----|-----|

### DESJKT 500, 500c

|      |               |
|------|---------------|
| 256K | POWERCUT! £49 |
|------|---------------|

### JET DIRECT

|                 |       |
|-----------------|-------|
| EX PRINT SERVER | £Call |
|-----------------|-------|

### NETSERVER SERIES

|             |       |
|-------------|-------|
| 32MB Module | £1399 |
|-------------|-------|

### DESIGNJET 600/650

|     |      |
|-----|------|
| 4MB | £155 |
|-----|------|

### PAINTJET XL300

|                    |       |
|--------------------|-------|
| HP COLOUR LASERJET | £Call |
|--------------------|-------|

### HP COLOUR LASERJET

|            |      |
|------------|------|
| 4MB Module | £149 |
|------------|------|

## MATCHED MEMORY FOR HP APOLLO Workstations

• Call for models not listed here

• All HP Apollo memory is individually tested

### APOLLO 9000 807S - 897S

|                           |       |
|---------------------------|-------|
| 32MB Board with 16MB&1509 |       |
| 32MB Board                | £2304 |

### APOLLO 3000

|               |          |
|---------------|----------|
| 917LX - 967LX | 16MB Kit |
| £997          |          |

|           |       |
|-----------|-------|
| 32MB Kit  | £1811 |
| 128MB Kit | £6265 |

### APOLLO 9000 705, 710

|          |                |
|----------|----------------|
| 8MB Kit  | POWERCUT! £532 |
| 16MB Kit | £968           |

|          |       |
|----------|-------|
| 32MB Kit | £2384 |
|----------|-------|

### ENVIZEE RANGE

|             |      |
|-------------|------|
| 16MB Module | £699 |
|-------------|------|

## MEMORY FOR SILICON GRAPHICS Workstations

### POWER SERIES IRIS

|          |       |
|----------|-------|
| 32MB Kit | £2030 |
|----------|-------|

### PROFESSIONAL IRIS

|     |      |
|-----|------|
| 4MB | £265 |
|-----|------|

### INDIGO, 4D/30, 4D/35533

|          |                 |
|----------|-----------------|
| 64MB Kit | POWERCUT! £1999 |
|----------|-----------------|

### CHALLENGE M/ POWER

|                  |       |
|------------------|-------|
| CHALLENGE SERIES | £Call |
|------------------|-------|

## MATCHED MEMORY FOR SUN Workstations

- SPARC tested and approved
- All Sun memory is individually tested
- Workstation experts available

### SPARC 1, 3/60, 3/80, 4/40, 4/60, 4/65, 4/75

|         |                |
|---------|----------------|
| 4MB Kit | POWERCUT! £162 |
|---------|----------------|

|          |      |
|----------|------|
| 16MB Kit | £499 |
|----------|------|

### SPARC ELC

|          |                |
|----------|----------------|
| 16MB Kit | POWERCUT! £489 |
|----------|----------------|

### SPARC LX

|          |       |
|----------|-------|
| 32MB Kit | £1199 |
|----------|-------|

### SPARC 330, 370 & 390

|          |       |
|----------|-------|
| 16MB Kit | £1294 |
|----------|-------|

|          |       |
|----------|-------|
| 32MB Kit | £1802 |
|----------|-------|

### SPARC SERVER 630, 670, 690

|          |       |
|----------|-------|
| 64MB Kit | £2812 |
|----------|-------|

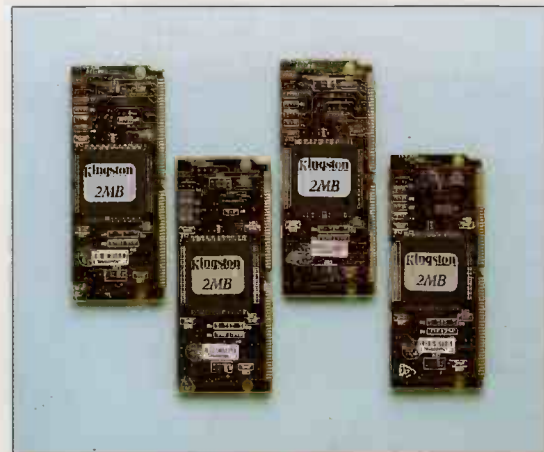
### SPARC 630MP, 670 & 690

|      |       |
|------|-------|
| 64MB | £2812 |
|------|-------|

|       |       |
|-------|-------|
| 128MB | £5402 |
|-------|-------|

### SPARCSTATION 10/20

|      |      |
|------|------|
| 16MB | £599 |
|------|------|



## MATCHED MEMORY FOR IBM RISC Workstations

• Call for models not listed here

• All workstation memory is individually tested

### RISC SYSTEM 6000

|          |       |
|----------|-------|
| 32MB Kit | £1383 |
|----------|-------|

|          |       |
|----------|-------|
| 64MB Kit | £2787 |
|----------|-------|

|           |         |
|-----------|---------|
| 448MB Kit | £17,384 |
|-----------|---------|

### POWERSTATION/ POWERSERVER 200

|         |      |
|---------|------|
| 8MB Kit | £298 |
|---------|------|

### X STATION

|         |      |
|---------|------|
| 6MB Kit | £228 |
|---------|------|

All our Matched Memory Kits come with our famous double guarantee - full lifetime warranty and 14 day money back guarantee



## BEWARE

Beware of third party, low grade memory. Powermark plc only supply premium upgrades from market leaders with manufacturer's approvals.

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- Full Internet connection • POP3 Email • Worldwide Web Browsing
- FTP • Telnet • Usenet • Many local points of presence
- On-line or telephone support • Free Internet guide



# BANK at Powermark

## CYRIX FEATURE

### THE NEW CYRIX 386 TO 486 PROCESSOR UPGRADE

**Cyrix**

Plug in the new Cyrix 386 to 486 Processor Upgrade. It's the fastest, most cost effective way to a 486 computer and its totally compatible with the world's leading software: DOS, Windows and OS/2 operating systems.

It's easy to install. Just clip on the Cyrix processor and load the cache installation software. It's as simple as that. You're ready to run in minutes.



THE CYRIX MICROPROCESSOR UPGRADE FAMILY



Certificate no. FS 26535  
BS5750 registered for the supply of computer, printer and workstation memory, processor and other upgrades.  
Powermark plc is regularly assessed by the British Standards Institution to ensure compliance with the quality standard.

The package consists of one Cx486DRx<sup>2</sup> Microprocessor, a 386DX removal tool, (SX version is a clip-on chip), installation manual, upgrade cache installation software (on both 3.5" and 5.25" media) and a pin 1 locator arrow (for correctly aligning the upgrade processor in the socket). A Cyrix-green heatsink is also included with 20/40, 25/50 and 33/66 versions.

#### CYRIX DRx<sup>2</sup>/SRx<sup>2</sup>

- Single chip upgrade solution for 386 DX and SX personal computers
- Clock doubling technology for increased performance
- 1K on-chip cache
- Very easy to install
- Compatible with DOS, Windows and OS/2
- Free technical support
- Limited lifetime warranty

#### EVEN LOWER PRICES!

##### 386DX

|                      |      |                 |
|----------------------|------|-----------------|
| DX 16MHz → 486 32MHz | £135 | <del>£195</del> |
| DX 20MHz → 486 40MHz | £135 | <del>£235</del> |
| DX 25MHz → 486 50MHz | £155 | <del>£265</del> |
| DX 33MHz → 486 66MHz | £185 | <del>£199</del> |

##### 386SX

|                      |      |                 |
|----------------------|------|-----------------|
| SX 16MHz → 486 32MHz | £135 | <del>£169</del> |
| SX 20MHz → 486 40MHz | £135 | <del>£169</del> |
| SX 25MHz → 486 50MHz | £155 | <del>£185</del> |

#### LIMITED OFFER!

Buy any Cyrix Processor Upgrade from Powermark and claim your **FREE Maths Co-Processor** from Cyrix.  
(Stocks are limited and maths Co-Processors are not shipped from Powermark)

## INTEL OVERDRIVE FEATURE

**intel**



#### OVERDRIVE

Intel OverDrive processors enable you to take advantage of advanced technology on your existing upgradable Intel 486 CPU-based system. OverDrive processors accelerate all applications running under MS-DOS, Windows, OS/2 and UNIX. Simply install the Intel OverDrive processor into your existing system and watch your applications run at blazing speeds.

Intel OverDrive processors are available for all Intel 486 CPU-based systems with or without an OverDrive socket.

**LIFETIME WARRANTY ON ALL INTEL OVERDRIVE PROCESSORS**

#### INTEL DX4 OVERDRIVE

- For most 16, 20, 25, 33MHz Intel 486 SX or DX CPU-based systems
- Features Intel's "speed tripling" technology
- 16K on-chip cache memory
- On-chip maths co-processor
- The most powerful PC upgrade available

|                |                  |      |
|----------------|------------------|------|
| INTEL DX4      | <b>POWERCUT!</b> |      |
| 16MHz → 48MHz  |                  | £169 |
| INTEL DX4      | <b>POWERCUT!</b> |      |
| 20MHz → 60MHz  |                  | £169 |
| INTEL DX4      |                  |      |
| 25MHz → 75MHz  |                  | £169 |
| INTEL DX4      | <b>POWERCUT!</b> |      |
| 33MHz → 100MHz |                  | £209 |



#### INTEL DX2 OVERDRIVE

Give your Intel 486 SX or DX PC 66MHz performance with the Intel DX2 OverDrive processor

- For any 16, 20, 25 or 33MHz Intel 486 SX or DX CPU-based systems

- Features Intel's "speed doubling" technology
- 8K on-chip cache memory
- On-chip maths co-processor
- Opens and runs all your software applications faster on your system

|               |                  |      |
|---------------|------------------|------|
| INTEL DX2     |                  |      |
| 25MHz → 50MHz |                  | £85  |
| INTEL DX2     | <b>POWERCUT!</b> |      |
| 33MHz → 66MHz |                  | £129 |

#### INTEL PENTIUM OVERDRIVE

The Pentium OverDrive processor is the newest and fastest member of the Intel OverDrive processor family. It is the upgrade option for Intel SX2 and DX2 CPU-based systems and is the superior upgrade option for Intel 486SX and DX based systems. It is based on Intel's latest and most sophisticated Pentium processor technology and features a superscalar architecture, which allows the execution of more than one instruction per clock cycle, 32K on-chip cache (one 16K code cache and one 16K data cache) and a faster floating point unit. It operates at two and a half times the speed of the system bus. For example, when a Pentium OverDrive processor is installed in a 33MHz Intel 486 DX based system, the integer unit, floating point unit and cache operate at 83MHz while the speed of the external bus remains at 33MHz, thus delivering Pentium processor class performance.

|                  |      |
|------------------|------|
| INTEL P24T 63MHz | £265 |
| INTEL P24T 83MHz | £241 |

### Technical Sales Order Lines

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(50 lines)

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**HUGE STOCKS**  
Guaranteed same day despatch on virtually all orders placed even up to 5.00pm.

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Our sales people are the best. They are trained specialists in their chosen field - multimedia, memory of all types, mass storage, networking and communications.

**FINANCIAL STABILITY**  
Powermark plc has been supplying upgrades for over 4 years and has an annual turnover exceeding £17 million with a healthy balance sheet.

**LOW PRICES**  
We only supply products from leading manufacturers and at low, low prices too.

**TECHNICAL SUPPORT**  
Dedicated after sales technical support teams on line to help with installation.

**CORPORATE & PUBLIC SECTOR**  
We welcome orders from corporate, education and public sector organisations. Just fax or phone your order number.

**FULL MANUFACTURERS' WARRANTIES**  
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when you buy  
any modem from  
Powermark



# Power



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Order Lines  
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951 3355  
(50 lines)**

... and here's what some of our customers have said ...

"A brief note to thank you very much for your help when I phoned yesterday in connection with a memory upgrade for an old Viglen Dossier notebook. I did appreciate very much your assistance and your efficiency. ...Once again, I wish to express my thanks for your assistance. When next I need any other computer items I know where I shall apply - Powermark!"

Dr O'Reilly, Dublin

**HMSO**

Public Sector customers can purchase through HMSO by calling 01603 694153.

**TURN THE PAGE  
FOR MORE**

### REAL HARD DRIVES

Famous hard drives...  
*Steve McQueen's 289 Mustang in Bullitt*

*Driving with the hood down in winter*

*The Minis down the steps in The Italian Job*



# MEMORY

## MASS STORAGE FEATURE

### HARD DISKS

#### CONNER

| IDE     |        |      |                       |
|---------|--------|------|-----------------------|
| CFS210A | 270MB  | 14ms | £99                   |
| CFS420A | 420MB  | 14ms | <b>POWERCUT!</b> £125 |
| CFA540A | 545MB  | 12ms | £149                  |
| CP1060A | 1.06GB | 10ms | £410                  |

#### SCSI

|         |        |      |      |
|---------|--------|------|------|
| CFA540S | 540MB  | 12ms | £232 |
| CFP1060 | 1.06GB | 10ms | £410 |
| CFP210S | 2.1GB  | 9ms  | £825 |

#### FUJITSU

| IDE   |       |      |                       |
|-------|-------|------|-----------------------|
| M2681 | 264MB | 12ms | <b>POWERCUT!</b> £101 |
| M2682 | 353MB | 12ms | <b>POWERCUT!</b> £115 |
| M2684 | 532MB | 12ms | <b>POWERCUT!</b> £149 |

#### SCSI

|         |        |      |      |
|---------|--------|------|------|
| M2684S  | 540MB  | 12ms | £180 |
| M2694ES | 1.08GB | 10ms | £385 |

#### IBM

#### SCSI

|         |     |     |       |
|---------|-----|-----|-------|
| 86F0102 | 2GB | 9ms | £899  |
| 90F0780 | 4GB | 9ms | £1995 |

#### STARFIRE 3.5", 1"

|                 |       |     |      |
|-----------------|-------|-----|------|
| /// <b>NEW!</b> | 2.1GB | 8ms | £967 |
|-----------------|-------|-----|------|

#### STARFIRE 3.5", 1.6"

|                 |       |     |       |
|-----------------|-------|-----|-------|
| /// <b>NEW!</b> | 4.3GB | 8ms | £1698 |
|-----------------|-------|-----|-------|

#### PEGASUS II AND ALLICAT

- New generation very fast hard disks
- Fast SCSI II

|            |        |     |                       |
|------------|--------|-----|-----------------------|
| PEGASUS II | 1.05GB | 9ms | <b>POWERCUT!</b> £585 |
|------------|--------|-----|-----------------------|

#### MAXTOR

| IDE   |       |      |      |
|-------|-------|------|------|
| 7273A | 245MB | 15ms | £114 |
| 7345A | 340MB | 15ms | £126 |
| 7545A | 545MB | 12ms | £165 |

#### SCSI

|       |       |      |      |
|-------|-------|------|------|
| 7345S | 340MB | 14ms | £163 |
| 7545S | 545MB | 9ms  | £245 |
| 1240S | 1.4GB | 9ms  | £699 |

#### QUANTUM

| IDE      |       |      |      |
|----------|-------|------|------|
| LPS270AT | 270MB | 12ms | £112 |
| LPS340AT | 340MB | 12ms | £125 |
| LPS425AT | 425MB | 12ms | £128 |
| LPS525AT | 525MB | 10ms | £149 |

#### SCSI

|          |       |      |                       |
|----------|-------|------|-----------------------|
| LPS240S  | 245MB | 10ms | £127                  |
| LPS525S  | 525MB | 12ms | £175                  |
| LPS1225S | 1.2GB | 10ms | <b>POWERCUT!</b> £599 |

#### WESTERN DIGITAL

#### IDE

|         |       |      |                       |
|---------|-------|------|-----------------------|
| AC1210  | 212MB | 13ms | £99                   |
| AC1270  | 270MB | 13ms | <b>POWERCUT!</b> £111 |
| AC2340  | 340MB | 13ms | <b>POWERCUT!</b> £126 |
| AC2420  | 420MB | 13ms | <b>POWERCUT!</b> £131 |
| AC2540  | 540MB | 13ms | <b>POWERCUT!</b> £152 |
| AC2700  | 730MB | 10ms | <b>POWERCUT!</b> £195 |
| AC31000 | 1.0GB | 10ms | £299                  |

#### MICROPOLIS

#### IDE

|       |       |      |      |
|-------|-------|------|------|
| 2217A | 1.7GB | 10ms | £699 |
|-------|-------|------|------|

#### SCSI

|      |        |       |                       |
|------|--------|-------|-----------------------|
| 4110 | 1.0GB  | 8.5ms | <b>POWERCUT!</b> £425 |
| 2217 | 1.75GB | 10ms  | <b>POWERCUT!</b> £699 |
| 4221 | 2.1GB  | 8.5ms | £865                  |
| 1936 | 3.0GB  | 12ms  | £1410                 |
| 3243 | 4.3GB  | 8.5ms | £1976                 |
| 1991 | 9.1GB  | 12ms  | £3160                 |

#### AUDIO VISUAL DRIVES

|        |        |       |       |
|--------|--------|-------|-------|
| 4110AV | 1.0GB  | 8.5ms | £590  |
| 2217AV | 1.75GB | 10ms  | £840  |
| 4221AV | 2.1GB  | 8.5ms | £1338 |
| 1936AV | 3.0GB  | 12ms  | £1640 |
| 3243AV | 4.3GB  | 12ms  | £2100 |
| 1991AV | 9.1GB  | 8.5ms | £3220 |

### HARD DISK UPGRADES-AN EXPLANATION

As the latest software requires more and more storage the following upgrade options are available:

#### IDE TYPE HARD DISKS

- Up to two drives supported
- The ideal solution for stand alone PC's
- Capacities up to 1GB (BIOS limitations can be overcome by Powermark's Disk Manager software)

#### SCSI TYPE HARD DISKS

- Up to 7 devices supported. Ideal for file servers, power users and where other SCSI devices are being used
- Up to 9GB currently available
- No BIOS limitations
- Internal & external drives available

**HARD DISK EXPERTS  
AVAILABLE FOR  
SPECIALIST ADVICE**



#### TOSHIBA

#### IDE - 2.5" NOTEBOOK DRIVES

|          |       |      |      |
|----------|-------|------|------|
| MK2124FC | 130MB | 17ms | £159 |
| MK1724FC | 262MB | 12ms | £210 |
| MK2326FC | 340MB | 12ms | £249 |
| MK2428FC | 520MB | 12ms | £369 |

#### SCSI - 2.5" NOTEBOOK DRIVES

|          |       |      |      |
|----------|-------|------|------|
| MK2224FB | 213MB | 12ms | £279 |
| MK2428FB | 520MB | 12ms | £499 |

**ALL HARD DISKS  
INCLUDE A MINIMUM  
12 MONTH  
WARRANTY WITH  
2, 3 OR 5 YEARS ON  
MOST MODELS**

## SEAGATE HARD DISK FEATURE

**Seagate**



#### IDE

|          |       |            |      |
|----------|-------|------------|------|
| ST3243A  | 214MB | 16ms       | £99  |
| ST3291A  | 273MB | 13ms       | £102 |
| ST3391A  | 341MB | 13ms       | £115 |
| ST3491A  | 428MB | 14ms       | £125 |
| ST3655A  | 528MB | 12ms       | £151 |
| ST9150AG | 128MB | 16ms, 2.5" | £155 |
| ST9235AG | 209MB | 16ms, 2.5" | £205 |
| ST9935AG | 340MB | 16ms, 2.5" | £275 |
| ST9530AG | 455MB | 16ms, 2.5" | £390 |

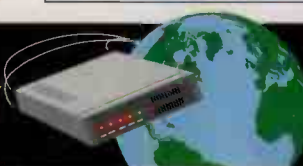
#### SCSI

|          |        |      |       |
|----------|--------|------|-------|
| ST3390N  | 344MB  | 12ms | £215  |
| ST3655N  | 528MB  | 12ms | £220  |
| ST4766N  | 665MB  | 15ms | £370  |
| ST31200N | 1.05GB | 9ms  | £383  |
| ST42400N | 2.1GB  | 10ms | £980  |
| ST43400N | 2.8GB  | 10ms | £1545 |
| ST41800N | 9GB    | 11ms | £3517 |

#### BARRACUDA FAMILY

|          |        |              |       |
|----------|--------|--------------|-------|
| ST11950N | 1.69GB | Fast SCSI II | £1045 |
| ST12550N | 2.14GB | Fast SCSI II | £988  |

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## CONNER BACKUP FEATURE

**CONNER**  
The Storage Answer

### CONNER TAPE-STOR 420MB

#### EASY-TO-USE, COST EFFECTIVE

The Tape-Stor 420 data protection system (TSM420) provides reliable low-cost per megabyte storage and makes portable and desktop system backup easier than ever.

#### Kit includes:

- Internal or external tape drive
- Backup Exec software
- Floppy or parallel port interface cable
- User guide
- 420MB data cartridge
- Up to 420MB capacity with data compression and a 9.5MB/minute backup rate
- QIC wide media is fully backward compatible with QIC80 and can read QIC40



|                          |      |
|--------------------------|------|
| TAPE-STOR 420MB INTERNAL | £129 |
| TAPE-STOR 420MB EXTERNAL | £235 |

### CONNER TAPE-STOR 850MB

- External parallel PortTape Backup or internal IDE system
- Compact, portable external system
- Up to 850MB capacity with data compression and a 9.5MB/minute backup rate
- QIC-wide and QIC-3010 compatibility

|                          |      |
|--------------------------|------|
| TAPE-STOR 850MB PARALLEL | £319 |
| TAPE-STOR 850MB INTERNAL | £209 |

## WANGDAT AND WANGTEK FEATURE

**WangDAT**  
A REXON COMPANY

### WANGDAT 3200 2GB/4GB 3.5" DAT

- Slim 3.5" half-height DATAclass DAT mechanism
- In-path tape buffer arm for precise tape tension
- 2GB capacity in DDS read/write mode
- DDS-DC Data Compression for 4GB up to 8GB
- 183-732KB/second data transfer rate
- 768 Kbyte cache buffer with full parity
- 30 second average data access time
- SCSI-I or SCSI-II interface (selectable)
- SCSI bus down-loadable drive firmware
- 5MB/second SCSI burst rate
- Built-in self-activated head cleaner
- Automatic Power-Safe tape braking

|                               |      |
|-------------------------------|------|
| WANGDAT INTERNAL UNITS        |      |
| Model 3100 2GB                | £635 |
| Model 3200 4GB                | £675 |
| Model 3400 8GB (DDS-2)        | £775 |
| Add £95 for external versions |      |



**WANGTEK**  
DAT DIVISION A REXON COMPANY

### WANGTEK 5150PK

WangTEK's new 5150PK 'Windows' series tape kits offer the industry's best value in performance tape backup for ISA or MCA bus PC's, workstations and Novell networks. With a storage capacity of 500MB using software data compression (250MB native), these new drives deliver the capacity you need plus the features and ease of use that only Sytos Plus software offers. Sytos Plus for WINDOWS provides a complete backup

and restore solution for the WINDOWS environment. Select the files to backup quickly using the point and click File Spec extension buttons. It has true background operation that will let you work while you backup. You can even pre-

define the level of system resources dedicated to backup versus your other processing tasks.

- QIC-150 data format/250MB capacity
- ES models include Quick File Access (QFA). EQ models include FlexFormat. Both ES and EQ models reduce seek-to-data and append times to under 2 minutes
- SCSI I Interface (ES model)
- QIC-02 Interface (EQ model)
- 5.25 inch, half-height form factor

|                                   |      |
|-----------------------------------|------|
| 5150PK/EQ INTERNAL QIC-02 ISA KIT | £319 |
| 5150PK/ES INTERNAL SCSI ISA KIT   | £319 |
| Add £95 for external versions     |      |
| 5100HT 1GB QIC Internal           | £499 |
| 5100HT 1GB QIC External           | £619 |



## CHEYENNE FEATURE

### ARCSERVE FOR NETWORK WINDOWS EDITION

ARCserve Windows edition maintains the same innovative functions as the award-winning ARCserve DOS edition and adds new functionality. Whether you have a small single-server or a large multi-server network environment, ARCserve Windows edition will back up all NetWare servers, DOS, Windows, OS/2, with optional modules for UNIX and Macintosh workstations, as well as database servers.

## CHEYENNE

#### ARCsolo

Standalone workstation Backup

| DOS | Windows | OS/2 |
|-----|---------|------|
| £85 | £95     | £139 |

#### ARCserve

|            | DOS   | Windows |
|------------|-------|---------|
| 5 User     | £183  | £193    |
| 10 User    | £342  | £392    |
| 25 User    | £519  | £609    |
| 50 User    | £637  | £737    |
| 100 User   | £759  | £859    |
| 250 User   | £839  | £1059   |
| 500 User   | £Call | £Call   |
| 1000+ User | £Call | £Call   |

Upgrades available - call for details



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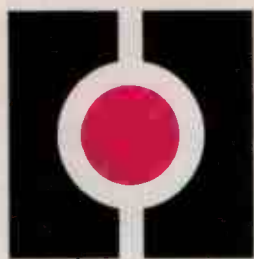
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# Power



# Mark

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951 3355  
(50 lines)**

## DATA CARTRIDGES

|              | each | 10 pack |
|--------------|------|---------|
| DC6150       | £11  | £99     |
| DC6250       | £16  | £135    |
| DC6525       | £17  | £144    |
| DC9100Magnus | £29  | £260    |

| QIC      | capacity  | each | 10 pack |
|----------|-----------|------|---------|
| DC2120   | 120-250MB | £10  | £89     |
| DC2120XL | 350MB     | £16  | £135    |
| QIC3010  | 700MB     | £18  | £165    |

| QIC-Wide | capacity | each | 10 pack |
|----------|----------|------|---------|
| 550Oc    | 420MB    | £17  | £145    |
| 900Oc    | 850MB    | £19  | £170    |

| DAT          | length | each | 10 pack |
|--------------|--------|------|---------|
| 1.3GB        | 60m    | £10  | £49     |
| 2GB          | 90m    | £11  | £54     |
| 4GB          | 120m   | -    | £85     |
| Head Cleaner |        | £26  |         |

**BSI**  
REGISTERED FIRM  
NATIONAL  
ACCREDITATION  
OF CERTIFICATION  
BODIES

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**DELIVERY CHARGES**

**SEE PAGE 11**

# MEMORY

## IOMEGA TAPE BACKUP FEATURE

**IOMEGA**  
Makers of Bernoulli

- Complete family offers a solution for every need:

Tape250 for hard disks up to 250MB and Tape700 for hard disks up to 680MB

- 3.5" patented beltless design ensures problem free operation
- Latest generation software support for DOS and

Windows included so no need for upgrades

- Tape250 has full QIC-80 compatibility also reading QIC-40 and Irwin formats
- Tape700 has full QIC-3010 compatibility and also reads QIC-80, QIC-40 and Irwin formats
- Kits include cables, software and 3.5" to 5.25" brackets
- Internal units fit in any free drive bay without adding extra cards
- Parallel Port units are plug-and-play external
- 2 year warranty on all Iomega tape streamers



TAPE700 INTERNAL

|                           |        |
|---------------------------|--------|
| TAPE250 INTERNAL          | £89    |
| TAPE250 PARALLEL PORT     | £166   |
| QIC & WIDE 420MB INTERNAL | £109   |
| QIC & WIDE 420MB PARALLEL | £199   |
| TAPE700 INTERNAL          | £185   |
| TAPE700 PARALLEL PORT     | £275   |
| TAPE ACCELERATOR CARD     | £49    |
| 700MB DATA CARTRIDGE      | £14.95 |



TAPE250 PARALLEL PORT

## HP - COLORADO FEATURE

**COLORADO**  
MEMORY SYSTEMS

A division of  
**hp** HEWLETT  
PACKARD



COLORADO TRAKKER 700

## COLORADO TRAKKER

- Plug and play - no hardware installation
- A total backup solution - fully assembled systems available in up to 250MB and up to 680MB capacities
- QIC-80 and QIC-3010-MC industry standard recording format
- Can be moved among laptops, notebooks, desktops, and towers alike

|                           |      |
|---------------------------|------|
| PARALLEL PORT TRAKKER 250 | £189 |
| PARALLEL PORT TRAKKER 350 | £219 |
| PARALLEL PORT TRAKKER 700 | £299 |
| TRAKKER CARRY CASE        | £37  |

## COLORADO JUMBO

- Value for money
- Connects to your floppy controller
- Internal device fits either 3.5" or 5.25" half height drive bays
- Includes software and cables

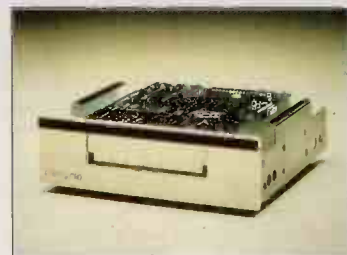
|                       |      |
|-----------------------|------|
| JUMBO 250             | £93  |
| JUMBO 350             | £115 |
| JUMBO 700             | £199 |
| FAST CONTROLLER CARD  | £55  |
| EXTERNAL MOUNTING KIT | £67  |

## HP JETSTORE SERIES

- Very fast DAT drive system
- 2GB, 4GB or 8GB capacity
- PC Magazine Editors' Choice
- 3 year HP on-site warranty for only £140

|                  | Int  | Ext  | ISA Kit* |
|------------------|------|------|----------|
| HP JetStore 2000 | £642 | £772 | £892     |
| HP JetStore 5000 | £735 | £865 | £1599    |
| HP JetStore 6000 | £885 | £985 | £2039    |

\*ISA Kit includes SCSI controller & full software



COLORADO JUMBO 700

## SCSI AND OPTICAL DRIVE FEATURE

### ADAPTEC SCSI CONTROLLER CARDS

**adaptec**  
I/O. NOW MORE IMPORTANT THAN EVER™



Industry standard SCSI controllers from Adaptec

|                 | Bare Card | Kit With Software |
|-----------------|-----------|-------------------|
| AHA1505         | -         | £42               |
| AHA1510         | -         | £55               |
| AHA1515         | -         | £66               |
| AHA1522 ISA     | -         | £119              |
| AHA1542 ISA     | £127      | £173              |
| AHA1640 MCA     | £184      | £229              |
| AHA2742T EISA   | £229      | £261              |
| AHA2940 PCI     | £199      | -                 |
| AHA2842VL/K VLB | -         | £199              |

### PCMCIA SCSI ADAPTERS

| VISUAL MEDIA   |      |
|----------------|------|
| PCMCIA II      | £206 |
| ADAPTEC APA460 |      |
| PCMCIA         | £159 |

### FLOPPY DRIVES

#### INTERNAL FLOPPY DRIVES

- Check compatibility with your system before ordering
- |                                       |     |
|---------------------------------------|-----|
| 5.25" 1.2MB DISK DRIVE                | £43 |
| 3.5" 1.44MB DISK DRIVE IN 5.25" SHELL | £34 |

#### PARALLEL FLOPPY DRIVES

- From MicroSolutions, Parallel Drives are extremely portable
- |                   |      |
|-------------------|------|
| 3.5" 1.44MB DRIVE | £132 |
| 5.25" 1.2MB DRIVE | £132 |

### EARLY BIRD

**Order Bonus**  
See page 29 of this advertisement

### OPTICAL DRIVES

|                                  |       |
|----------------------------------|-------|
| PANASONIC LF7300                 | £1599 |
| • 1.5GB storage                  |       |
| • 45ms seek time                 |       |
| • 5 Mbits/sec data transfer rate |       |
| • External version available     |       |
| FUJITSU M2512A                   | £499  |
| • 1.09MB/sec data transfer rate  |       |
| • 128MB capacity                 |       |
| • 30ms access time               |       |
| • External version available     |       |

**POWER  
THE NET!**



**Access the Internet through Powermark's PNet**

- Full Internet connection • POP3 Email • Worldwide Web Browsing
- FTP • Telnet • Usenet • Many local points of presence
- On-line or telephone support • Free Internet guide



# BANK at Powermark

## SYQUEST STORAGE FEATURE



# SyQuest®



SYQUEST SQ5200

**UNSURPASSED WARRANTIES - 2 YEARS ON DRIVES AND 5 YEARS ON DATA CARTRIDGES**

### SYQUEST 3.5" RANGE

With your choice of 105MB or 270MB formatted capacities on each cartridge, these drives let you add as much removable storage as you'll ever need.

### SYQUEST REMOVABLE CARTRIDGE HARD DISK DRIVES

- Work like fixed drives yet provide unlimited capacity
- Superior performance to optical drives and higher reliability than floppy drives
- Perform backup faster than tape
- Provide data security

### SYQUEST CARTRIDGES

| Capacity | Form  | Each | 5 Pack |
|----------|-------|------|--------|
| 105MB    | 3.5"  | £41  | £200   |
| 270MB    | 3.5"  | £51  | £240   |
| 44MB     | 5.25" | £44  | £215   |
| 88MB     | 5.25" | £62  | £302   |
| 200MB    | 5.25" | £73  | £360   |

**PORTABLE VERSIONS IDEAL FOR NOTEBOOKS AND PORTABLES**

### SYQUEST REMOVABLE CARTRIDGE HARD DISK DRIVES

|               | Type     | Capacity | Internal | External |
|---------------|----------|----------|----------|----------|
| SyQuest 3.5"  | IDE      | 105MB    | £139     | £229     |
| SyQuest 3.5"  | SCSI     | 105MB    | £183     | £273     |
| SyQuest 3.5"  | PARALLEL | 105MB    | -        | £389     |
| SyQuest 3.5"  | IDE      | 270MB    | £290     | £380     |
| SyQuest 3.5"  | SCSI     | 270MB    | £295     | £385     |
| SyQuest 3.5"  | PARALLEL | 270MB    | -        | £471     |
| SyQuest 5.25" | SCSI     | 88MB     | £190     | £280     |
| SyQuest 5.25" | SCSI     | 200MB    | £289     | £379     |

## VERBATIM FEATURE

# Verbatim®



### DISKETTES

|                                     |       |
|-------------------------------------|-------|
| 3.5" HD 10 Pack                     | £5.90 |
| 3.5" HD Preformatted 20 Pack+2 free | £14   |

Buy any storage device from Powermark and get 10% discount on supporting media. (Only at the time of purchase).

### DATA AND DAT CARTRIDGES

Verbatim's tape products meet the demands of a wide range of users with QIC, Standard and Mini Cartridges and Helical Scan tapes, Verbatim offers an unrivalled range of applications. Each tape cartridge comes with a LIFETIME GUARANTEE.

|               | Unit | 10 Pack |
|---------------|------|---------|
| DC2120        | £9   | £79     |
| DC2120 QIC 80 | £15  | £139    |
| DC2120XL      | £15  | £139    |
| MC 3000       | £17  | £155    |
| MC 3000 XL    | £19  | £175    |
| MC 3000 XL    |      |         |
| Preformatted  | £25  | £229    |
| 4mm 90m       | £10  | £89     |
| 4mm 60m       | £9   | £79     |
| 8mm 112m      | £11  | £99     |

### BLANK CDS

|             |     |
|-------------|-----|
| CD-R 74 Min | £19 |
|-------------|-----|



### OPTICAL DISKS

Verbatim dominate the recordable optical media market: offering the widest range of products to suite all applications. The MAC-READY format is now available on 3.5" and 5.25" disks.

|             |     |
|-------------|-----|
| 3.5" 128MB  | £25 |
| 3.5" 230MB  | £36 |
| 5.25" 600MB | £59 |
| 5.25" 1.3GB | £68 |

## ANDEST MODEM FEATURE

### ANDEST MODEMS

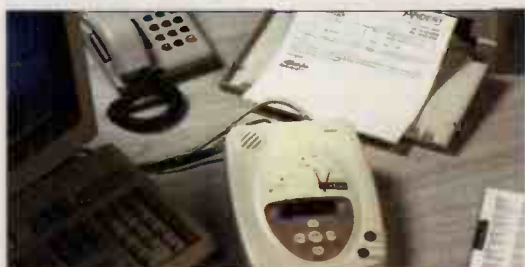
| Model                           | V21 | V22 | V22bis | V32 | V32bis | V32terbo | MNP2-4 | V42 | V42bis | MNP5 | Fax | Internal  | External |
|---------------------------------|-----|-----|--------|-----|--------|----------|--------|-----|--------|------|-----|-----------|----------|
| Rocket Silver                   | ●   | ●   | ●      | ●   | ●      | ●        | ●      | ●   | ●      | ●    | ●   | POWERCUT! | £115     |
| Rocket Gold (with Win-Dos Lite) | ●   | ●   | ●      | ●   | ●      | ●        | ●      | ●   | ●      | ●    | ●   | POWERCUT! | £135     |
| Rocket Platinum (Terbo)         | ●   | ●   | ●      | ●   | ●      | ●        | ●      | ●   | ●      | ●    | ●   | NEW!      | £169     |
| V.PA V22bis                     | ●   | ●   | ●      | ●   | ●      | ●        | ●      | ●   | ●      | ●    | ●   |           | £347     |
| V.PA V32bis                     | ●   | ●   | ●      | ●   | ●      | ●        | ●      | ●   | ●      | ●    | ●   |           | £439     |

Now includes Rocketboard Hi-Speed serial card

All modems supplied by Powermark plc are BABT APPROVED

VIRTUAL PA V32BIS

# ANDEST LIMITED



Technical Sales Order Lines

**0181-951 3355**  
(50 lines)

MASS STORAGE AND MODEMS

**HUGE STOCKS**  
Guaranteed same day despatch on virtually all orders placed even up to 5.00pm.

**TECHNICAL SALES PEOPLE**  
Our sales people are the best. They are trained specialists in their chosen field - multimedia, memory of all types, mass storage, networking and communications.

**FINANCIAL STABILITY**  
Powermark plc has been supplying upgrades for over 4 years and has an annual turnover exceeding £17 million with a healthy balance sheet.

**LOW PRICES**  
We only supply products from leading manufacturers and at low, low prices too.

**TECHNICAL SUPPORT**  
Dedicated after sales technical support teams on line to help with installation.

**CORPORATE & PUBLIC SECTOR**  
We welcome orders from corporate, education and public sector organisations. Just call or phone your order number.

**FULL MANUFACTURERS' WARRANTIES**  
All products supplied by Powermark plc carry manufacturers' warranties and of course full Powermark plc guarantees.

**TURN THE PAGE FOR MORE**

**UPGRADE DRIVE THRU**  
While-you-wait installation service available. See page 3 for details.

**PERSONAL CALLERS**  
Save delivery charges - there's plenty of parking. Telephone first to check our stock position on the items you want. We're open from 9.00am to 6.00pm Monday to Friday. Saturdays: Sales from 9.30am to 4.00pm. Technical Support and Customer Service from 10.00am to 2.00pm.

**Powermark plc**  
Premier House, 112 Station Rd, Edgware, Middlesex HA8 7AQ  
Tel: 0181-951 3355  
(50 lines)  
Fax: 0181 905 6233  
Email: sales@powermark.com

VISA MasterCard SWITCH

Cards are not debited until despatch  
VAT at 17.5% will be added to all prices

**POWER THE NET!**

**RATES**  
£12.50 once-only membership  
£15 per month subscription  
ABSOLUTELY NO OTHER HIDDEN SERVICE CHARGES  
Quit at any time without penalties

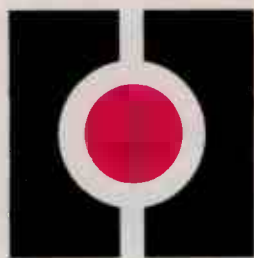
Call 0181-951-3355 and ask for our PNet specialists

Join for only £9.95 when you buy any modem from Powermark

10



# Power



# Mark®

**Technical Sales  
Order Lines  
0181-  
951 3355  
(50 lines)**



**SMALL ITEMS**  
Examples: memory, sound/video cards, CD ROM titles, small software packages  
UP TO 3 ITEMS £6.95 total  
4 ITEMS OR MORE £1.95 for each additional item

**LARGE ITEMS**  
Examples: CD ROM drives, monitors, multimedia kits, printers, software suites  
1ST ITEM £8.95  
EACH ADDITIONAL ITEM £4.95

Call for rates outside UK mainland

... and here's what some of our customers have said ...  
*Thank you for your help this morning. It was a pleasure to speak with someone so cheerful first thing in the day.*  
J Couper-Johnston  
Langham Arts, London

**TURN THE PAGE  
FOR MORE**

## JUKEBOX HITS

Anything by Level V.42

Teenage CIX  
The Undertones

Simon Smith And The  
Amazing Dancing  
Bear Drive

Alan Price



# MEMORY

## MULTITECH MODEM FEATURE

**MultiTech®  
Systems**

### MULTITECH MODEMS

| Model            | V21 | V22 | V22bis | V32 | V32bis | V32terbo | V.34 | MNP2-4 | V42 | V42bis | MNP5 | Fax | External       |
|------------------|-----|-----|--------|-----|--------|----------|------|--------|-----|--------|------|-----|----------------|
| NEW! MT2834BLK   | ●   | ●   | ●      | ●   | ●      | ●        | ●    | ●      | ●   | ●      | ●    | ●   | POWERCUT! £399 |
| MT1932ZDX        | ●   | ●   | ●      | ●   | ●      | ●        | ●    | ●      | ●   | ●      | ●    | ●   | POWERCUT! £115 |
| MT1432LTi PCMCIA | ●   | ●   | ●      | ●   | ●      | ●        | ●    | ●      | ●   | ●      | ●    | ●   | POWERCUT! £189 |
| MT1432MK Pocket  | ●   | ●   | ●      | ●   | ●      | ●        | ●    | ●      | ●   | ●      | ●    | ●   | £330           |
| MT1432BLK        | ●   | ●   | ●      | ●   | ●      | ●        | ●    | ●      | ●   | ●      | ●    | ●   | POWERCUT! £315 |
| NEW! MT2834ZDX   | ●   | ●   | ●      | ●   | ●      | ●        | ●    | ●      | ●   | ●      | ●    | ●   | £209           |



### MULTIMODEM II MT1932 ZDXK

- Desktop unit
- Group 3/Class 2 (TR29) fax
- V.17 fax compatible
- PSTN only
- V42 (lap-M) error correction
- V42bis data compression
- MNP to Level 5
- Asynchronous operation
- AT command set (Hayes compatible)
- Free Multiexpress fax and comms software for windows
- 10 year warranty
- Available in 28.8bps (V34)

All modems supplied  
by Powermark plc are  
BAST APPROVED



MULTIMODEM II MT1932 ZDX

### MULTIMODEM II MT1432BLK

- Desktop unit
- Metal enclosure
- Group 3/Class 2 (TR29) fax
- PSTN and 2W/4W leased line
- Leased line dial-backup with auto-restoral
- Security call-back (30 no.)
- V42 (lap-M) error correction
- V42bis data compression
- MNP to Level 5
- V25bis async/sync
- V54 loop back tests
- Unix UUCP support
- IBM AS/400 support
- AT command set (Hayes compatible)
- Free Multiexpress fax and comms software
- 5 year warranty

### MULTIMODEM MT1432LTi

- PCMCIA Type II
- Group 3/v.17 Class 2 (TR29) fax
- PSTN only
- Remote configuration
- V42 (lap-M) error correction
- V42bis data compression
- MNP to Level 5
- Incorporates flash technology
- V54 loop back tests
- Unix UUCP support
- AT command set (Hayes compatible)
- 10 number telephone directory
- Free Multiexpress fax and comms software
- 5 year warranty

## DYNALINK MODEM FEATURE

*Dynalink*

All modems feature:  
Bell 103, Bell 212A, CCITT V.21, V.22, V.22bis, V.23, V.32, V.32 bis, V.42, V.42bis, V.27 ter/V.29, V.17, T30/T 4, MNP2-5, 2W leased line, Delrina 4 in 1 software, MNP-10 option, RS232 Y cable, telephone cable

### 1414 VQE EXTERNAL

- Synchronous mode, 8 LED indicators
- V.25bis dialling option

### 1414 VQH INTERNAL

- IRQ selectable 3, 4, 5 & 7
- Autosync (option)
- Com 1 - 4 selectable
- 16550 UART



Public Sector customers can  
purchase through HMSO  
by calling 01603 694153.



### 1414 VQC PCMCIA

- PCMCIA II compatible
- Computer Shopper 'Best Buy' award Dec '94



### DYNALINK MODEMS

| Model           | V21 | V22 | V22bis | V32 | V32bis | MNP2-4 | V42 | V42bis | MNP5 | HST Cellular | Fax | Internal | External |
|-----------------|-----|-----|--------|-----|--------|--------|-----|--------|------|--------------|-----|----------|----------|
| 1414 VQE        | ●   | ●   | ●      | ●   | ●      | ●      | ●   | ●      | ●    | ●            | ●   | -        | £119     |
| 1414 VQH        | ●   | ●   | ●      | ●   | ●      | ●      | ●   | ●      | ●    | ●            | ●   | £115     | -        |
| 1414 VQP POCKET | ●   | ●   | ●      | ●   | ●      | ●      | ●   | ●      | ●    | ●            | ●   | -        | £135     |
| 1414 VQC PCMCIA | ●   | ●   | ●      | ●   | ●      | ●      | ●   | ●      | ●    | ●            | ●   | -        | £147     |

### 1414 VQP POCKET

- Battery operation
- 4 LED indicators
- 16550 UART
- Computer Shopper 'Best Buy' award Dec '94

**COMPUTER  
SHOPPER**



**POWER  
THE NET!**



Access the Internet through Powermark's PNet

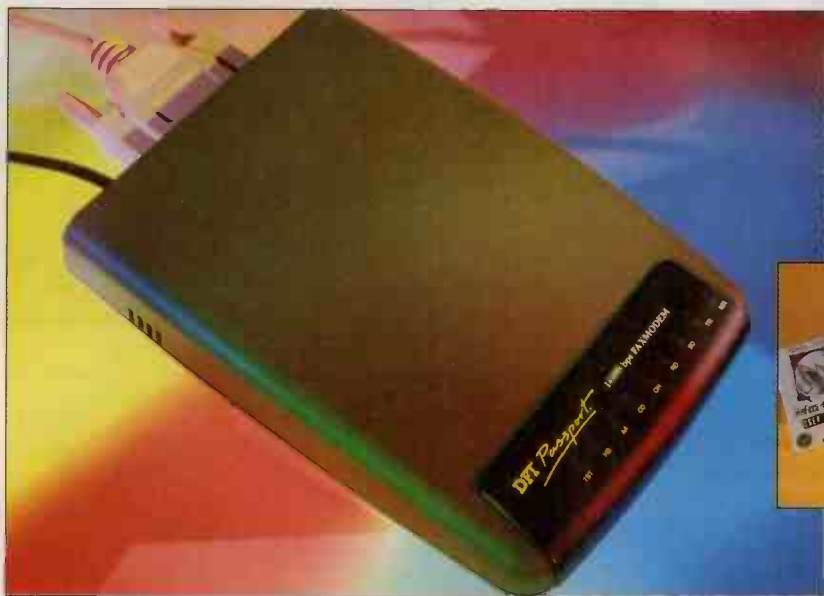
- Full Internet connection • POP3 Email • Worldwide Web Browsing
- FTP • Telnet • Usenet • Many local points of presence
- On-line or telephone support • Free Internet guide



# BANK

# at Powermark

## DFI MODEM FEATURE



### EARLY BIRD



**Order Bonus**  
See page 29 of this advertisement



### DFI MODEMS

| Model            | V21 | V22 | V22bis | V32 | V32bis | V32terbo | V.34 | MNP2-4 | V42 | V42bis | MNP5 | HST Cellular | Fax | Internal | External |
|------------------|-----|-----|--------|-----|--------|----------|------|--------|-----|--------|------|--------------|-----|----------|----------|
| Passport F1114V  | ●   | ●   | ●      | ●   | ●      | ●        | ●    | ●      | ●   | ●      | ●    | ●            | ●   | £89      | £89      |
| Passport F1128V+ | ●   | ●   | ●      | ●   | ●      | ●        | ●    | ●      | ●   | ●      | ●    | ●            | ●   | £189     | £189     |

# DFI®

### F1114V

#### Features

- Data/Fax speed: 14,400 bps
- V.32, V.32 BIS, V.42, V.42BIS
- MNP level 2-4, 5
- Fax Class 1, 2 & 3
- Call back security
- Full/half duplex and auto fallback

#### Accessories included

- Serial cable
- Telephone lead
- User's manual
- AC adapter

#### Software

- Delrina's 4 in 1 Win/DOS Fax Lite and Comit Lite DOS/Win software for data transmission

#### Access

- Introductory membership to CompuServe

#### Warranty

- 5 years

### F1128V+

#### Features

- Data/Fax speed: 28,800/14,400 BPS
- V.32, V.32 BIS, V.42, V.42 BIS, V.34
- MNP Level 2-4, 5
- Fax Class 1, 2 & 3
- Call back security
- Full/half duplex and auto fallback

#### Accessories included

- Serial cable
- Telephone lead
- User's manual
- AC adapter

#### Software

- Delrina's 4 in 1 Win/DOS Fax Lite and Comit Lite DOS/Win software for data transmission

#### Access

- Introductory membership to CompuServe

#### Warranty

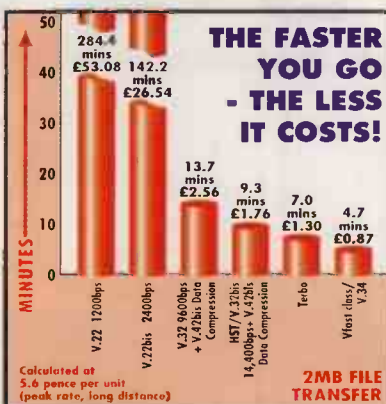
- 5 years



Certificate no. FS 26535

BS5750 registered for the supply of computer, printer and workstation memory, processor and other upgrades.

Powermark plc is regularly assessed by the British Standards Institution to ensure compliance with the quality standard.



## TRUST MODEM FEATURE



- 14,400 bps full duplex data
- Includes telephone plug and cable, software and manual
- Trio Datafax (DOS), Datafax (Windows) and DataComm (DOS) software
- 5 year warranty



### TRUST MODEMS

| Model  | V21 | V22 | V22bis | V23 | V32 | V32bis | MNP2-5 | V42 | V42bis | Fax | Internal | External |
|--------|-----|-----|--------|-----|-----|--------|--------|-----|--------|-----|----------|----------|
| AE1414 | ●   | ●   | ●      | ●   | ●   | ●      | ●      | ●   | ●      | ●   | ●        | £95      |
| AC1414 | ●   | ●   | ●      | ●   | ●   | ●      | ●      | ●   | ●      | ●   | ●        | £95      |

## POWER THE NET!

**RATES** £12.50 once-only membership  
£15 per month subscription  
ABSOLUTELY NO OTHER HIDDEN SERVICE CHARGES  
Quit at any time without penalties

Call 0181-951-3355 and ask for our PNet specialists

Join for only £9.95 when you buy any modem from Powermark

### Technical Sales Order Lines

**0181-951 3355**  
(50 lines)

# MODEMS

**HUGE STOCKS**  
Guaranteed same day despatch on virtually all orders placed even up to 5.00pm.

**TECHNICAL SALES PEOPLE**  
Our sales people are the best. They are trained specialists in their chosen field - multimedia, memory of all types, mass storage, networking and communications.

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Dedicated after sales technical support teams on line to help with installation.

**CORPORATE & PUBLIC SECTOR**  
We welcome orders from corporations, education and public sector organisations. Just fax or phone your order number.

**FULL MANUFACTURERS' WARRANTIES**  
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**TURN THE PAGE FOR MORE**

**UPGRADE DRIVE THRU**  
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Save on delivery charges - there's plenty of parking. Telephone first to check our stock position on the items you want. We're open from 9.00am to 6.00pm Monday to Friday. Saturdays: Sales from 9.30am to 4.00pm, Technical Support and Customer Service from 10.00am to 2.00pm.

**Powermark plc**  
Premier House, 112 Station Rd, Edgware, Middlesex HA8 7AQ

**Tel: 0181-951 3355**  
(50 lines)

**Fax: 0181 905 6233**

**Email: sales@powermark.com**



Cards are not debited until despatch  
VAT at 17.5% will be added to all prices





**Mark®**

**Technical Sales  
Order Lines  
0181-  
951 3355  
(50 lines)**

## HAYES ESP ACCELERATOR CARDS

- Helps PCs to keep up with fast modems
- Recommended for all 288 and 144 modems
- Can run at speeds up to 921,600bps

ESP Card - 1 Port £74  
ESP Card - 2 Port £108

## CABLES

2 metre  
9F to 25M £8  
2 metre  
25F to 25F £8

Call for modem/serial cables and adaptors not listed here.



Certificate no. FS 26535

... and here's what some of our customers have said ...  
*Thank you for promptly carrying out our order which we received next day! You have restored our faith in direct sales.*

A G Brenton  
University College of Swansea

**TURN THE PAGE  
FOR MORE**

**EARLY BIRD**

**Order Bonus**  
See page 29 of this advertisement

# MEMORY

## RACAL MODEM FEATURE

### RACAL MAXAM RANGE

#### RACAL MAXAM MXF1432

The Maxam MXF1432 from Racal-Datcom provides a powerful combination of capabilities and performance for all data, facsimile and IBM host access requirements.

- V.32bis, V.32, V.22bis, V.22, V.23, V.21
- 14400, 9600, 2400, 1200 and 300bit/s
- Send and receive Group 3 fax
- PSTN and leased line operation



- Dial-back and link security
- IBM 3270/5250 communications features
- Local and remote configuration

### RACAL MAXAM MODEMS

| Model   | V21 | V22 | V22bis | V32 | V32bis | MNP2-4 | MNP5 | Fax | Internal | External |
|---------|-----|-----|--------|-----|--------|--------|------|-----|----------|----------|
| MXF2422 | •   | •   | •      | •   | •      | •      | •    | •   | •        | £153     |
| MXF9632 | •   | •   | •      | •   | •      | •      | •    | •   | •        | £257     |
| MXF1432 | •   | •   | •      | •   | •      | •      | •    | •   | •        | £369     |

### RACAL ISDN RANGE

#### ISDN: THE NEW NETWORKING TECHNOLOGY

ISDN represents a fundamental change in wide area communications, providing fast reliable switched digital communications and delivering substantial cost savings to those who adopt it. ISDN applications are expanding rapidly, ranging from dial-in host access with short access times and higher speeds to multinational LAN networking.

#### RACAL DAP4100

- Exploits power of ISDN
- Dial modem replacement
- Digital leased circuit replacement
- Single or dual port, standalone or nest
- User selectable interface V.24, V.35, X.21
- AT, V.25Bis & X.30/X.21 autodialling
- 64Kbit/s-2400bit/s with V.110 rate adaption
- CMS400 network management
- CLIP, MSN & subaddress support

RACAL DAP4100 SINGLE £649

RACAL DAP4100 DUAL £719



#### RACAL DAP4500

- Reduces cost of digital leased network resilience
- Automatic high speed back-up & restore
- Up to 64Kbit/s back-up bandwidth over ISDN
- Single or dual channel, standalone or nest
- Disaster recovery facility
- Time windows minimises ISDN call costs
- User selectable interface: V.24, V.35, X.21
- CMS400 network management
- CLIP, MSN & subaddress support
- Terminal adapter capability

RACAL DAP4500 SINGLE £1029

RACAL DAP4500 DUAL £1399

## LASAT MODEM FEATURE

# LASAT

### LASAT MODEMS

| Model                       | V21 | V22 | V22bis | V32 | V32bis | V.34 | MNP2-4 | MNP5 | MNP10 | Fax | External               |
|-----------------------------|-----|-----|--------|-----|--------|------|--------|------|-------|-----|------------------------|
| Unique 144                  | •   | •   | •      | •   | •      | •    | •      | •    | •     | •   | £199 <del>£297</del>   |
| Unique 144 Lite (Main only) | •   | •   | •      | •   | •      | •    | •      | •    | •     | •   | £119 <del>£195</del>   |
| Unique 288 VFC              | •   | •   | •      | •   | •      | •    | •      | •    | •     | •   | £Call <del>£Call</del> |
| Credit 144 PCMCIA           | •   | •   | •      | •   | •      | •    | •      | •    | •     | •   | £169 <del>£225</del>   |



UNIQUE 144

- 10 year warranty on LASAT modems
- Quality modems manufactured in Denmark
- All LASAT modems feature MNP10 for cellular use
- Winfax Lite software included with all modems
- All modems are BABT approved and come complete with cable



SAFIRE 144

### UNIQUE 144

The LASAT Unique 144 is a V.32 bis desktop fax modem that is also easy to use as a portable.

- NiCad battery
- MNP 10
- Autosync
- Synchronous
- Callback security
- Remote configuration
- Two-wire leased line
- V.25 bis dialling
- Small 3.5" square footprint
- 'Bang & Olufsen' like design

"We were wrong to expect a good looking modem to perform badly. The Unique 144 displayed perfect data performance... and its throughput was excellent."

Computer Shopper,  
April 1994

### CREDIT 144

The LASAT Credit 144 is a fully featured PCMCIA V.32 bis fax modem. It has a built in high speed serial port emulator to give your notebook the highest possible data throughput capability.

- MNP 10 for cellular use
- Autosync
- Callback security
- Remote configuration
- Two-wire leased line
- V.25 bis dialling
- V.17 - 14,400 bps fax

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All modems supplied  
by Powermark plc are  
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- Full Internet connection • POP3 Email • Worldwide Web Browsing
- FTP • Telnet • Usenet • Many local points of presence
- On-line or telephone support • Free Internet guide



## PACE FAX MODEM FEATURE



**Now only  
£219**

**Voice  
Fax  
Modem!**



### MESSAGE DESK

- Integrated voice messaging
- Voice, fax and data forwarding
- 14400bps fax and data
- V42/V42bis error correction/data compression
- Free voice, fax and data software

All models supplied by Powermark plc are **BABY APPROVED**

### LINNET 34 fx

- All data speeds to V34 28800bps
- 115,200bps maximum throughput
- All fax speeds to Group 3 14400bps
- V42/V42bis error correction/data compression
- Free fax and comms software

### PACE MODEMS

| Model                     | V21 | V22 | V22bis | V32 | V32bis | V32terbo | V42 | V42bis | MNP2-4 | MNP5 | Fax | Voice | Internal | External |
|---------------------------|-----|-----|--------|-----|--------|----------|-----|--------|--------|------|-----|-------|----------|----------|
| MobiFax                   | •   | •   | •      |     |        |          |     |        | •      | •    | •   | •     | -        | £75      |
| <b>NEW</b> MobiFax 144    | •   | •   | •      | •   | •      | •        | •   | •      | •      | •    | •   | •     | -        | £97      |
| MICROLIN fx 32Plus        | •   | •   | •      | •   | •      | •        | •   | •      | •      | •    | •   | •     | £139     | £149     |
| MICROLIN fx 34            | •   | •   | •      | •   | •      | •        | •   | •      | •      | •    | •   | •     | £249     | £249     |
| PCMCIA MICROLIN NB 32Plus | •   | •   | •      | •   | •      | •        | •   | •      | •      | •    | •   | •     | -        | £195     |
| PCMCIA MICROLIN V.34      | •   | •   | •      | •   | •      | •        | •   | •      | •      | •    | •   | •     | -        | £Call    |
| Linnet 32Plus fx          | •   | •   | •      | •   | •      | •        | •   | •      | •      | •    | •   | •     | -        | £156     |
| <b>NEW</b> Message Desk   | •   | •   | •      | •   | •      | •        | •   | •      | •      | •    | •   | •     | -        | £219     |
| <b>NEW</b> Linnet 34 fx   | •   | •   | •      | •   | •      | •        | •   | •      | •      | •    | •   | •     | -        | £275     |

### MOBIFAX 144

- 14400bps fax and data
- Portable, pocket sized

- Error correction/data compression software
- Free CompuServe and BBS time
- Free cable included



## U.S. ROBOTICS MODEM FEATURE

# USRobotics®

The Intelligent Choice in Data Communications

### US ROBOTICS MODEMS

| Model  | V21 | V22 | V22bis | V32 | V32bis | V32terbo | V.34 | MNP2-4 | V42 | V42bis | MNP5 | HST Cellular | Fax | Internal         | External |
|--|-----|-----|--------|-----|--------|----------|------|--------|-----|--------|------|--------------|-----|------------------|----------|
| Sportster 14.4 + Fax   | •   | •   | •      | •   | •      | •        | •    | •      | •   | •      | •    | •            | •   | £127             | £126     |
| Sportster 28.8 V.34 + Fax  | •   | •   | •      | •   | •      | •        | •    | •      | •   | •      | •    | •            | •   | £199             | £193     |
| Sportster 28.8 V.34 Mac + Fax  | •   | •   | •      | •   | •      | •        | •    | •      | •   | •      | •    | •            | •   | <b>POWERCUT!</b> | £209     |
| Courier Dual V.34 + Fax  | •   | •   | •      | •   | •      | •        | •    | •      | •   | •      | •    | •            | •   | £265             | -        |
| Courier Dual V.34 + Fax  | •   | •   | •      | •   | •      | •        | •    | •      | •   | •      | •    | •            | •   | <b>POWERCUT!</b> | £275     |
| Includes FREE PowerPort High Speed Dual Async Serial Card, cable and upgrade to Quicklink Gold (OCR software)      |     |     |        |     |        |          |      |        |     |        |      |              |     |                  |          |
| WorldPort 14.4 + Fax   | •   | •   | •      | •   | •      | •        | •    | •      | •   | •      | •    | •            | •   | £168             | -        |
| PCMCIA 14.4 + Fax  | •   | •   | •      | •   | •      | •        | •    | •      | •   | •      | •    | •            | •   | <b>POWERCUT!</b> | £193     |
| PowerPort High Speed Dual Async Serial Card. Recommended for turbo and V.fast modems to prevent bottleneck of data |     |     |        |     |        |          |      |        |     |        |      |              |     |                  |          |



SPORTSTER 28.8 + FAX

### SPORTSTER 28.8 + FAX

The world's best selling modem just got better. With speeds of up to 28,800bps, the Sportster 28.8 + Fax offers proven high performance technology, at an unbeatable price.



COURIER V.34



WORLDPORT 14.4

### WORLDPORT 14.4

Small enough to fit in your pocket, whilst providing you with all your data communications needs both in and out of the office, the WorldPort Dual Standard Cellular Fax is the perfect choice for the mobile user.

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STABILITY**  
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We only supply products from leading  
manufacturers and at low, low prices  
too.

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line to help with installation.

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We welcome orders from  
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only £9.95  
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any modem from  
Powermark



# Power



# Mark®

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(50 lines)

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A professional range of automatic voice, fax and data line switches

**MSL MANAGER 1100** £89

- Calls switched to fax, phone or answerphone

**MSL MANAGER 3300** £105

- Supports up to 4 telephone handsets

**MSL MANAGER 3300M** £127

- As above but switching to modem instead of fax

**MSL MANAGER 7700** £147

- Will additionally support and switch a modem or PC



Public Sector customers can purchase through HMSO by calling 01603 694153.



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COMMUNICATORS**

*Sony Walkmans*

*Cats Whiskers*

*The Crystal  
Palace Aerial*

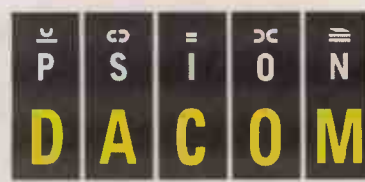


# MEMORY

## PSION MODEM FEATURE



METEOR 28.8



## PSION DACOM MODEMS

| Model              | V21 | V22 | V22bis | V32 | V32bis | V32terbo | V34 | V42 | V42bis | MNP2-4 | MNP5 | Fax | External |
|--------------------|-----|-----|--------|-----|--------|----------|-----|-----|--------|--------|------|-----|----------|
| PCMCIA Gold V32bis | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | £199     |
| PCMCIA Gold V.fast | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | £279     |
| PCMCIA Gold V34    | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | £345     |
| Meteor 14.4        | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | £189     |
| Meteor 28.8        | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | £245     |

All modems supplied by Powermark plc are BABT APPROVED

## ZOOM MODEM FEATURE



**Windows User:  
Best On Test,  
February 94**

- Remote configuration and callback security
- High speed 14,400 bps fax and data transmission with V.42bis and MNP 2-5
- Extended status reporting with 15 LED lights (14.4X only)
- 5 year warranty
- Buffered 16550 UART to prevent data overruns (14.4i only)

All modems supplied by Powermark plc are BABT APPROVED



## ZOOM MODEMS

| Model        | V21 | V22 | V22bis | V32 | V32bis | V32terbo | V34 | V42 | V42bis | Fax | Internal | External |
|--------------|-----|-----|--------|-----|--------|----------|-----|-----|--------|-----|----------|----------|
| 14.4X        | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●   | -        | £125     |
| 14.4i        | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●   | £125     | -        |
| 14.4X MacPak | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●   | -        | £149     |

**Personal  
Computer  
World: Editor's  
Choice Award  
Dec '93 and  
June '93**

## HAYES MODEM FEATURE



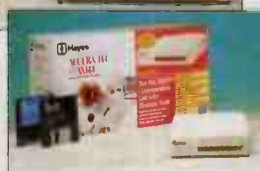
ACCURA 288

### ACCURA+FAX

Low cost fax modems with all of the quality and ease-of-use that comes with the Hayes name.

### OPTIMA+FAX

Offers outstanding performance with the ability to compress data twice as much as other fax modems.



OPTIMA 288



## HAYES MODEMS

The industry standard

| Model  | V21 | V22 | V22bis | V32 | V32bis | V32terbo | V34 | V42 | V42bis | MNP2-4 | MNP5 | Fax | Internal | External |
|--|-----|-----|--------|-----|--------|----------|-----|-----|--------|--------|------|-----|----------|----------|
| ACCURA 144 + Fax                                       | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £138     |
| ACCURA 288 + Fax                                       | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £178     |
| OPTIMA 144 + Fax                                       | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £255     |
| OPTIMA 144 PCMCIA                                      | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £199     |
| OPTIMA 288   | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £369     |
| OPTIMA 288 bundle                                      | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £699     |
| 2 pack with free accelerator cards and upgrade to V.34 | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £699     |
| ULTRA 96   | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £Call    |
| ULTRA 144  | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £Call    |
| ULTRA ISDN 64K System Adapter                          | ●   | ●   | ●      | ●   | ●      | ●        | ●   | ●   | ●      | ●      | ●    | ●   | -        | £795     |

ESP high speed serial card, 1 port £108, 2 port £74

15

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NetWare 4.1 incorporates all the advantages of previous versions of NetWare, plus gives you new capabilities designed to increase productivity, reduce costs, and simplify installing and maintaining your network. It elevates networking to the next level and lays the foundation for a distributed computing infrastructure. NetWare 4.1 enables users to easily see and use all resources

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- Maximum number of connections is 1,000
- Offers a single network login for access to all available resources
- Improved memory management and protection whilst utilising both ring 3 and 0
- Enhanced security utilising RSA public/private key cryptography

- Greater support for data migration hardware
- Intelligent data compression (real time)
- Real time data migration (HCSS)
- Independent network auditing features
- Remote management features
- Automatic file grooming and archiving (sub-allocation and data migration)
- Built in multi-protocol routing
- Support for over 250 printers per server
- Image processing In-built
- Supports CD ROM as mappable drive volumes
- All utilities rewritten or updated with some utilities merged - all utilities in GUI format
- New simplified menu driven installation
- Improved ITX WAN behaviour with enhanced routing of IPX, AppleTalk and IP
- New and enhanced SFT III 4.1 providing NetWare for SAA, NetWare for MAC and NMS support
- Internationalisation via Multilingual language modules
- NetWare messaging services, NetWare/IP and NetWare for OS/2 supplied in the box



### NOVELL NETWORK 4.1 CD

|          |       |
|----------|-------|
| 5 USER   | £485  |
| 25 USER  | £1745 |
| 50 USER  | £2295 |
| 100 USER | £3385 |
| 250 USER | £5995 |

### NOVELL NETWORK 3.12

|          |       |
|----------|-------|
| 5 USER   | £385  |
| 10 USER  | £905  |
| 25 USER  | £1349 |
| 50 USER  | £1825 |
| 250 USER | £4575 |

## XIRCOM FEATURE



### CREDIT CARD ETHERNET + MODEM II

- Simultaneous Ethernet/803.2 LAN plus 19,200 bps data and 14,400 bps send/receive fax modem operation in one slot
- Modem software configurable to support localised telephone requirements in US and 14 European countries
- Supports advanced PCMCIA features including HotSwap, Suspend/Resume and Integrated Power Management

- Serial port/UART emulation provides increased compatibility with all popular terminal and fax software
- Performance modem communications via Xircom's Modem Application Programming Interface (XMAPI)
- Includes terminal and fax software for Windows
- Support for remote node access applications
- Includes Windows terminal and fax software

|           |      |
|-----------|------|
| CEM2-10BT | £399 |
| CEM2-10B2 | £389 |
| CEM2-10BC | £425 |

## Xircom

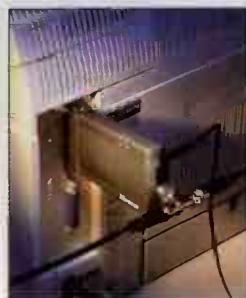
### CREDIT CARD TOKEN RING ADAPTER IIs

- High-performance, memory-saving SmartRing software
- 16 or 4 Mbps software selectable ring speed
- Windows and DOS based installation program automatically configures PC and NOS setup
- Intuitive Windows based user utility for easy adapter management
- Allows 'hot' removal and reinsertion while preserving system status
- Supports both shielded & unshielded twisted pair Token-Ring cabling
- Compatible with the widest range of platforms

PS-CT2-16CTP £299



### POCKET ETHERNET ADAPTER III



- Universal connection for all notebook, laptop and desktop PCs
- Enhanced Parallel Port (EPP) capable
- Requires no internal expansion slots
- No jumpers or configuration switches to set
- Ultra-compact, ergonomic design for maximum portability and one hand installation
- Phantom power cable
- Small, lightweight power supply included

|          |      |
|----------|------|
| PE3-10B2 | £185 |
| PE3-10BT | £185 |
| PE3-10BC | £209 |

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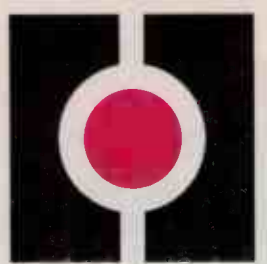
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Your "Technical Support" Engineer was extremely professional and likewise were your Customer Service Team. Unfortunately though they could not solve my problem.

This is not a letter of complaint but to say you've "got it right" at least at the front end. Your team inspires people to do business with you. Keep it up, excellent."

B R Evill  
Hampshire

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# MEMORY

## SMC NETWORKING FEATURE



### SMC EtherEZ Adapters

- Easiest installation into Plug and Play and non-'PnP' computers
- SimulTasking for top performance
- Extensive driver support via SMC SuperDisk
- Diagnostics LEDs
- PC Agent/SNMP for simple network management to the desktop
- 10BASE2, 10BASE-T and Combo versions
- Lifetime warranty
- Comes in a choice of single or five pack options

|                     | Single | 5 Pack |
|---------------------|--------|--------|
| EtherEZ Adapter BNC | £66    | £309   |
| TP                  | £66    | £309   |
| Combo               | £73    | £339   |



### SMC ETHERCARD ELITE ULTRA

|                      | Single | 6 Pack |
|----------------------|--------|--------|
| Elite 16 Ultra BNC   | £59    | £339   |
| Elite 16 Ultra TP    | £60    | £329   |
| Elite 16 Ultra Combo | £65    | £379   |

24 AND 50 PACKS ALSO AVAILABLE

### SMC ETHERPOWER PCI

|                      | Single | 5 pack |
|----------------------|--------|--------|
| EtherPower PCI TP    | £137   | £719   |
| EtherPower PCI Combo | £149   | £799   |

### SMC ELITECARD PCMCIA

|                     | Single |
|---------------------|--------|
| EliteCard PCMCIA TP | £140   |
| EliteCard Combo     | £159   |

### SMC ETHERCARD ELITE 32C ULTRA

|                       | Single | 6 pack |
|-----------------------|--------|--------|
| Elite 32C Ultra Combo | £159   | £849   |

### TIGER HUBS

|      | Number of Ports |     |     |    |       |
|------|-----------------|-----|-----|----|-------|
|      | TP              | BNS | AUI | FL |       |
| CX3  | 0               | 3   | 1   | 0  | £219  |
| TP6  | 6               | 0   | 1   | 0  | £159  |
| TP6B | 6               | 1   | 0   | 0  | £179  |
| TP12 | 12              | 1   | 1   | 0  | £319  |
| CX6  | 1               | 6   | 1   | 0  | £499  |
| FL6  | 0               | 1   | 1   | 6  | £Call |

## TRUST NETWORKING FEATURE



### TRUST UPS

With Monitor connector, spike protection and RFI filter

|           |      |
|-----------|------|
| 400 Watt  | £135 |
| 650 Watt  | £179 |
| 1200 Watt | £299 |

### TRUST NETWORK ADAPTERS

|                   |      |
|-------------------|------|
| NE2000 Plus BNC   | £25  |
| NE2000 Plus Combo | £29  |
| Boot ROM          | £9   |
| Pocket Adapter    |      |
| Combo             | £65  |
| PCMCIA Adapter    |      |
| Combo             | £109 |



### TRUST HUBS AND REPEATERS

|                      |      |
|----------------------|------|
| 2 Port Repeater      |      |
| BNC + AUI            | £179 |
| 6 Port Repeater      |      |
| BNC + AUI            | £269 |
| 8 Port Smart HUB TP  | £109 |
| 16 Port Smart HUB TP | £199 |
| 3 Port Ethernet      |      |
| Printer Server       | £199 |

## 3COM FEATURE



### 3C503 RANGE

- Standard 16-bit cards
- Shared memory architecture and 8K buffer

|            | BNC | R/45 | AUI | Unit | 5 Pack |
|------------|-----|------|-----|------|--------|
| 3C503-16   | ●   |      | ●   | £115 | £535   |
| 3C503-16TP |     | ●    | ●   | £115 | £535   |

### 3C509 RANGE

|         | BNC | R/45 | AUI | Unit | 5 Pack |
|---------|-----|------|-----|------|--------|
| 3C509   | ●   |      | ●   | £67  | £319   |
| 3C509TP |     | ●    | ●   | £70  | £319   |
| 3C509C  | ●   | ●    | ●   | £76  | £359   |

### 3C529 RANGE

- MCA Etherlink III cards

|         | BNC | R/45 | AUI | Unit | 5 Pack |
|---------|-----|------|-----|------|--------|
| 3C529   | ●   |      | ●   | £156 | £710   |
| 3C529TP |     | ●    | ●   | £156 | £710   |

### 3C579 RANGE

- 32-bit EISA interface using Parallel Tasking Architecture

|         | BNC | R/45 | AUI | Unit | 5 Pack |
|---------|-----|------|-----|------|--------|
| 3C529   | ●   |      | ●   | £149 | £699   |
| 3C529TP |     | ●    | ●   | £149 | £699   |

### 3C589 RANGE

- PCMCIA cards

|        | BNC | R/45 | AUI | Unit | 5 Pack |
|--------|-----|------|-----|------|--------|
| 3C589T |     | ●    |     | £139 | £669   |
| 3C589D | ●   |      |     | £149 | £699   |

### TOKEN RING PCMCIA

- AutoLink software
- LEDs for installation and trouble shooting

|       | Unit               | 5 Pack     |
|-------|--------------------|------------|
| 3C689 | TokenLink III 16/4 | £299 £1399 |



Certificate no. FS 26535

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# BANK at Powermark

## ARTISOFT FEATURE



### LANTASTIC NETWORK STARTER KIT

LANTastic is the most awarded network in the world (over 106 awards to date), with over 2.5 million users worldwide. Artisoft is the network for small/medium businesses. The LANTastic Starter Kit contains everything you need to

connect 2 PC's hardware, software, cables, manuals, T-pieces) in ONE box. When you need to add a node get an add-on kit.

Installation is exceptionally easy. If you are not fully satisfied there is a 30 day money back guarantee.

Get networked with LANTastic and get the most from your PC investment.

**Powerfully,  
simply,  
networking**

|                                      |      |
|--------------------------------------|------|
| LANTASTIC 2 NODE NETWORK STARTER KIT | £199 |
| LANTASTIC ADD-ON 1 NODE KIT          | £106 |

## ARTISOFT®

### LANTASTIC FOR OS/2 NETWORK OPERATING SYSTEM

The only network software that works in IBM OS/2 Warp V3.

As the world leader in peer-to-peer networks for DOS and Windows, LANTastic opens the door to sharing files and printers with minimal expense and maximum flexibility.

LANTastic for OS/2 is a 32-bit, multitasking, multithreaded network operating system that

supports Named Pipes and HPFS and FAT file systems. With a familiar interface, LANTastic for OS/2 allows you to take full advantage of the power of OS/2. It features tight security and strong management features - full network control at your fingertips and quick installation.

|        |      |
|--------|------|
| 1 USER | £89  |
| 5 USER | £370 |

|                                  |      |
|----------------------------------|------|
| <b>ALSO AVAILABLE:</b>           |      |
| LANTASTIC V6 FOR DOS AND WINDOWS | £65  |
| ARTICOM                          | £75  |
| ARTISAVE                         | £149 |



## INTEL NETWORKING FEATURE



### INTEL LANDESK MANAGEMENT SUITE V2.0

- Integrated desktop management applications including: software distribution and metering, inventory and remote control, printer management, traffic monitoring, powerful reporting and much more
- Powerful data capture and reporting

|                          |      |
|--------------------------|------|
| LANDESK MANAGER SUITE V2 | £349 |
| LANDESK MANAGER V1.51    | £675 |



### INTEL NETPORTEXPRESS XL PRINT SERVER

The high performance print server for multi-protocol networks. Supports Novell NetWare, UNIX and Macintosh network printing environments simultaneously. It connects up to three printers anywhere on your LAN, so it's easy to respond to changing users' needs.

- Print throughput of up to 180 KBps
- Simultaneously (multi-protocol) supports up to 3 protocols on up to 3 attached printers
- Software upgradable with Flash memory

|                       | Unit 3 Pack |      |
|-----------------------|-------------|------|
| NETPORT XL BNC/TP     | £324        | £899 |
| NETPORT XL TOKEN RING | £439        | -    |

#### ...ALSO AVAILABLE

|                       | Unit 3 Pack |      |
|-----------------------|-------------|------|
| NETPORT EL BNC/TP     | £259        | £749 |
| NETPORT EL TOKEN RING | £388        | -    |

### INTEL ETHEREXPRESS PRO



- Superior performance via concurrent processing, large 32k buffer and 32-bit instructions
- One step installation
- 90 day money back guarantee and limited lifetime warranty

#### ETHEREXPRESS 16

|         | BNC | RJ45 | AUI | Unit | 5 Pack |
|---------|-----|------|-----|------|--------|
| EE16    | •   | •    | •   | £69  | £325   |
| EE16-TP | •   | •    | •   | £69  | £325   |

#### ETHEREXPRESS FLASH

|         | BNC | RJ45 | AUI | Unit | 5 Pack |
|---------|-----|------|-----|------|--------|
| EF16    | •   | •    | •   | £70  | £327   |
| EF16-TP | •   | •    | •   | £70  | £327   |
| EF16C   | •   | •    | •   | £80  | £385   |

#### ETHEREXPRESS FLASH PRO

|          | BNC | RJ45 | AUI | Unit | 5 Pack |
|----------|-----|------|-----|------|--------|
| EFP16    | •   | •    | •   | £79  | £349   |
| EFP16-TP | •   | •    | •   | £79  | £349   |
| EFP16C   | •   | •    | •   | £89  | £379   |

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Email: sales@powermark.com

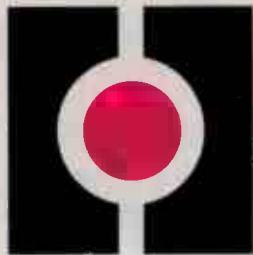
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Examples: memory, sound/video cards, CD ROM titles, small software packages  
UP TO 3 ITEMS £6.95 total  
4 ITEMS OR MORE £1.95 for each additional item

### LARGE ITEMS

Examples: CD ROM drives, monitors, multimedia kits, printers, software suites  
1ST ITEM £8.95  
EACH ADDITIONAL ITEM £4.95  
Call for rates outside UK mainland



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**TURN THE PAGE  
FOR MORE**

### MOVIE MEMORIES

*Orchid The  
Killer Whale*

*Terminator 2*

*VRAMbo*



# MEMORY

## NETWORK ACCESSORIES FEATURE

### CABLES

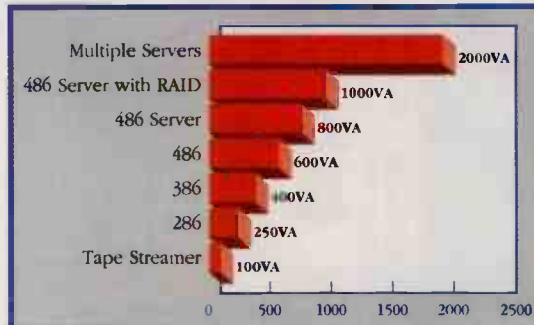
|                          | Unit | 10 Pack |
|--------------------------|------|---------|
| 1.5m Thin Ethernet Cable | £9   | £89     |
| 5m Thin Ethernet Cable   | £11  | £95     |
| 10m Thin Ethernet Cable  | £15  | £135    |
| 35m Thin Ethernet Cable  | £33  | £320    |

|                     | Unit | 10 Pack |
|---------------------|------|---------|
| BNC T-Piece         | £3   | £26     |
| BNC Terminator      | £3   | £22     |
| BNC In-Line Coupler | £3   | £28     |

### AMERICAN POWER CONVERSION UPS

|        | Rating (VA) | Av. backup time (mins) |
|--------|-------------|------------------------|
| SU250  | 250         | 8 £199                 |
| SU400  | 400         | 7 £249                 |
| SU900  | 900         | 7 £499                 |
| SU1250 | 1250        | 7 £559                 |
| SU2000 | 2000        | 7 £995                 |

|        | Rating (VA) | Av. backup time (mins) |
|--------|-------------|------------------------|
| CU250  | 250         | 7 £89                  |
| CU400  | 400         | 6 £149                 |
| CU600  | 600         | 8 £189                 |
| CU900  | 900         | 7 £319                 |
| CU1250 | 1250        | 7 £399                 |



Powerchute Network £59  
Powerchute Windows £65  
Powerchute Unix £99

UPS units are measured by a VA rating, typical VA requirements are shown above

## TRUST MICE AND SCANNERS FEATURE



### DIGITIZERS

| 1812 DIGITIZER                      | £265 | 1212 DIGITIZER  | £141 |
|-------------------------------------|------|---|------|
| • 18 x 12 inch drawing area         |      | • 12 x 12 inch drawing area                             |      |
| • Resolution of 1016 lines per inch |      | • Resolution of 1016 lines per inch                     |      |
| • Templates for AutoCad 10 - 12     |      | • Templates for AutoCad 10-12, ORCAD and Lotus 1-2-3 R3 |      |
| • 6 button puck                     |      | • 4 button puck   |      |
| • Serial interface                  |      | • Serial interface                                      |      |
| • Windows 3.1 drivers               |      | • Windows 3.1 drivers                                   |      |
| • Baud rate of 75 up to 19,200      |      | • Baud rate of 75 up to 19,200                          |      |



### SCANNERS

#### AMI SCAN GREY £49

- 105mm scan width
- Merge scan
- Scan speed 10-20 mm/sec
- 400 DPI resolution
- 256 grey levels (software)
- Interface card included
- TIFF/ BMP/ MSP/ IMG/ CUT/ PCX file formats
- Scankit utility and perceive personal OCR software for Windows

#### AMI SCAN COLOUR £99

- 105mm scan width
- Merge scan
- Scan speed 10-20 mm/sec
- 400 DPI resolution
- 24 bit, 16.8 million colours
- Interface card included
- TIFF/ PCX/ BMP/ JPG/ ESP file formats
- Scankit utility, perceive personal OCR and iPhoto plus software for Windows
- Twain compatible

#### IMAGERY 2400 POWERCUT! £459

- A4 scan area
- SCSI interface included
- TIFF/ PCX/ IMG/ JPG/ EPS file format
- 16.8 million colours, 256 levels of greyscale
- 2400 dpi with software interpolation
- Wordlink OCR and Adobe Photoshop LE software for Windows included
- Twain compatible scan driver

#### IMAGERY 1200 £309

- A4 scan area
- SCSI interface included
- 16.8 million colours, 256 greyscale levels
- 1200 dpi with software interpolation
- TIFF/PCX/IMG/JPG/EPS
- Wordlink OCR and iPhoto Plus software for Windows
- Twain compatible

### MICE

#### AMI MOUSE SERIAL £9

- 3 buttons
- 9 pin serial connector
- 300 DPI resolution
- Compatible with Microsoft and Mouse Systems mode

#### AMI TRACK SERIAL £19

- Trackball mouse
- 3 buttons



- 9 pin serial connector
- 260 DPI resolution

## HP SCANNERS FEATURE



#### HP SCANJET 3P

- Mono 300 dpi enhanced to 1200 dpi
- Up to 12 pages per minute
- Includes HP Picture Palace and Calera Wordscan V3.0

HP SCANJET 3P £349

#### AUTOMATIC DOCUMENT FEEDER

£147

#### 3 YEAR ON-SITE MAINTENANCE

£85



Call if the scanner you require is not listed here

#### HP SCANJET IICX

- 400 dpi enhanced to 1600 dpi
- Recognises over 16 million colours and 256 greyscales
- Includes Calera Wordscan V3.0, HP Deskscan 2 and Aldus PhotoStyler SE Lite

HP SCANJET IICX £695

TRANSPARENCY UNIT £445

#### AUTOMATIC DOCUMENT FEEDER

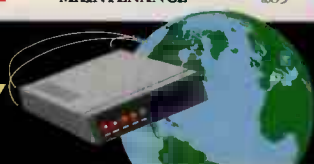
£345

#### 3 YEAR ON-SITE MAINTENANCE

£135



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## TAXAN FEATURE

### MONITORS

# TAXAN

- Taxan, market leader in display technology were the first manufacturer to introduce an energy efficient monitor compatible with the new EPA Energy Star programme - the adopted 'green' standard for the PC industry
- The Ergovision range not only help save the environment, they save you money too
- All monitors are Macintosh compatible - cable available at extra cost



#### TAXAN ERGOVISION 1080LR

A 20" analogue auto-scanning ultra high resolution colour monitor, compatible with IBM, Compaq, Apple and most other personal computers. It is an excellent solution for high resolution Windows applications.

**3 YEAR ON-SITE WARRANTY FROM ONLY £49**

#### TAXAN ERGOVISION 1080LR

|        | Size | Dot pitch | Resolution at up to: | Frequency | Tube             |           |       |
|--------|------|-----------|----------------------|-----------|------------------|-----------|-------|
| 400LR  | 14"  | 0.28mm    | 800 x 600            | 60Hz      | Energy Star      | POWERCUT! | £195  |
| 410LR  | 14"  | 0.28mm    | 1024 x 768           | 60Hz      | Energy Star      | POWERCUT! | £203  |
| 420LR  | 14"  | 0.28mm    | 1280 x 1024          | 60Hz      | Standard         | POWERCUT! | £239  |
| 580LR  | 15"  | 0.28mm    | 1280 x 1024          | 60Hz      | FST              | POWERCUT! | £290  |
| 880LR  | 17"  | 0.28mm    | 1280 x 1024          | 60Hz      | Energy Star, FST | POWERCUT! | £530  |
| 885LR  | 17"  | 0.26mm    | 1600 x 1200          | 65Hz      | Energy Star, FST | POWERCUT! | £636  |
| 895LR  | 17"  | 0.25mm    | 1600 x 1200          | 67Hz      | Trinitron        | POWERCUT! | £875  |
| 1080LR | 20"  | 0.28mm    | 1600 x 1200          | 65Hz      | Energy Star      | POWERCUT! | £949  |
| 1095LR | 20"  | 0.28mm    | 1600 x 1200          | 62Hz      | Trinitron        | POWERCUT! | £1459 |
| 2100LR | 21"  | 0.30mm    | 1600 x 1200          | 72Hz      | Diamondtron      | POWERCUT! | £1535 |



TAXAN ERGOVISION 880LR



TAXAN ERGOVISION 580LR



TAXAN ERGOVISION 410LR

### GRAPHICS CARD UPGRADES

|                | VRAM<br>1MB 2MB 4MB | DRAM<br>1MB 2MB | MCA | VLB | PCI | ISA  |
|----------------|---------------------|-----------------|-----|-----|-----|------|
| <b>ORCHID</b>  |                     |                 |     |     |     |      |
| FARENHEIT VA   | -                   | -               | •   | -   | -   | £109 |
| CELCIUS        | •                   | -               | -   | -   | -   | £139 |
| CELCIUS 2MB    | -                   | •               | -   | -   | -   | £182 |
| KELVIN 64      | -                   | -               | •   | -   | -   | £99  |
| KELVIN 64 2MB  | -                   | -               | •   | -   | -   | £125 |
| KELVIN 64 2MB  | -                   | -               | •   | -   | -   | £135 |
| <b>DIAMOND</b> |                     |                 |     |     |     |      |
| SPEEDSTAR PRO  | -                   | -               | •   | -   | -   | £75  |
| STEALTH 32     | -                   | -               | •   | -   | -   | £195 |
| STEALTH 64     | -                   | •               | -   | -   | -   | £229 |
| VIPER          | -                   | •               | -   | -   | -   | £279 |
| <b>NO.9</b>    |                     |                 |     |     |     |      |
| GXe 64         | -                   | -               | •   | -   | -   | £185 |
| GXe L11        | -                   | •               | -   | -   | -   | £396 |
| GXe L16        | -                   | -               | •   | -   | -   | £749 |
| GXi LITE L21   | •                   | -               | -   | -   | -   | £642 |
| GXi-TC+ L39    | -                   | •               | •   | -   | -   | £966 |

All cards are 1280 x 1024 and 16.7 million colours except Orchid Fahrenheit VA and No.9 GXe 64. Maximum colours are not necessarily at the highest resolution.

### WINTURBO ACCELERATORS

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- Powered by ATI 88800 Mach64 graphics engine
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- Up to 75Hz refresh rate in 1280 x 1024 mode
- Up to 100Hz refresh rate in VGA
- Installation via menu driven software for fast and simple setup

#### GTS WINTURBO

|     |          |      |
|-----|----------|------|
| ISA | 2MB VRAM | £249 |
| ISA | 4MB VRAM | £399 |
| VLB | 2MB VRAM | £249 |
| VLB | 4MB VRAM | £399 |
| PCI | 2MB VRAM | £249 |
| PCI | 4MB VRAM | £399 |

### WINBOOST ACCELERATORS

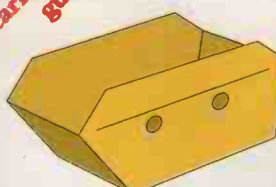
#### GTS WINBOOST

|     |          |      |
|-----|----------|------|
| ISA | 1MB DRAM | £115 |
| ISA | 2MB DRAM | £149 |
| VLB | 1MB DRAM | £115 |
| VLB | 2MB DRAM | £149 |
| PCI | 1MB DRAM | £115 |
| PCI | 2MB DRAM | £149 |

### THE SKIP

No warranty, no returns and no technical support, however, all products are tested and fully functional.

|                    |              |      |
|--------------------|--------------|------|
| MITSUMI L110       | CD-ROM DRIVE | £149 |
| CD-ROM DRIVE       | CD-ROM DRIVE | £139 |
| TOSHIBA 1001       | CD-ROM DRIVE | £199 |
| LOGIC BLK BACKMAN  | CD-ROM DRIVE | £39  |
| LOGIC BLK SCANN    | CD-ROM DRIVE | £29  |
| MEDIA PRO PLUS     | CD-ROM DRIVE | £29  |
| SX2/2550SX         | CD-ROM DRIVE | £42  |
| WORDPAC            | CD-ROM DRIVE | £199 |
| Bus Link BT        | CD-ROM DRIVE | £199 |
| CD-ROM DRIVE       | CD-ROM DRIVE | £20  |
| 4MB Compaq ST      | CD-ROM DRIVE | £59  |
| 1MB Kyocera FI 500 | CD-ROM DRIVE | £49  |
| Pentium 66MHz VLB  | CD-ROM DRIVE | £99  |
| 64MB Pentium R1    | CD-ROM DRIVE | £99  |
| 486/50MHz          | CD-ROM DRIVE | £49  |
| NB 100MHz          | CD-ROM DRIVE | £149 |
| HP 100MHz          | CD-ROM DRIVE | £99  |
| DEC 100MHz         | CD-ROM DRIVE | £149 |
| 127MB HDB          | CD-ROM DRIVE | £99  |
| 8MB NEC POWERMATE  | CD-ROM DRIVE | £199 |
| 386/255            | CD-ROM DRIVE | £199 |
| 8MB HP APOLLO      | CD-ROM DRIVE | £199 |



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Email: sales@powermark.com

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**RATES**  
£12.50 once-only membership  
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Join for only £9.95 when you buy any modem from Powermark



# Power



# Mark®

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Order Lines**  
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(50 lines)

## LEXMARK PRINTER FEATURE

**NEW!**

**1200 DPI  
LASER PRINTERS  
FROM ONLY £1199!**

|           |       |
|-----------|-------|
| Optra R   | £1199 |
| Optra RX  | £1899 |
| Optra L   | £1799 |
| Optra LX  | £2399 |
| Optra LXI | £2899 |

## HP SupportPack



- Onsite warranty by HP engineers
- Recommended for all HP Laserjets and Deskjets

**TURN THE PAGE  
FOR MORE**

## NEW! MEMORY LANE AGAIN

Do you remember this Memory Lane from May 1993...?

- ... The PC Junior
- ... Candid Camera
- ... Lava lamps
- ... Spangles



# MEMORY

## HP PRINTER FEATURE



# HEWLETT PACKARD

Authorised reseller

## HP DESKJET 320

- 600 x 300 dpi in black
- Up to 3 pages per minute in black
- 13 scalable Windows fonts

HP DESKJET 320 £169

HP DESKJET 320 WITH  
CUT SHEET FEEDER £189  
COLOUR KIT UPGRADE £32  
3 YEAR ON-SITE  
WARRANTY £39

## NEW! HP DESKJET 660C

- 800 x 600 dpi in black
- 14 TrueType fonts

HP DESKJET 660C £335

## NEW! HP DESKJET 1600C

- 800 x 600 dpi in black
- 4MB RAM

HP DESKJET 1600C £849



HP DESKJET 660C

## NEW! HP LASERJET 5P

- 6 pages per minute
- 26 seconds first page out
- 600 dpi, RET, microfine toner
- 2MB RAM, up to 50MB

HP LASERJET 5P £599

HP LASERJET 5MP £719

## HP LASERJET 4Si

- 16 pages per minute
- 600 dpi
- Includes 1 year on-site warranty
- Delivery: £17

HP LASERJET 4Si £2065

HP LASERJET 4SiMX £2935

3 YEAR ON-SITE  
WARRANTY £459

## HP LASERJET 4L

- 4 pages per minute
- 300 dpi
- 1MB RAM

HP LASERJET 4L £355

HP LASERJET 4ML £735

3 YEAR ON-SITE  
WARRANTY £89



HP LASERJET 5P

## HP COLOR LASERJET

- Up to 10 pages per minute in black
- Up to 2 pages per minute in colour
- 300 dpi
- 1 year on-site warranty

HP COLOR LASERJET £4395

IEEE 1284 COMPLIANT

PRINTER CABLE £19

HP COLOR LASERJET

CABINET £345

250 SHEET REAR

FEED UNIT £315



HP COLOUR LASERJET

## HP LASERJET 4 PLUS

- 12 pages per minute
- Up to 600 dpi
- 2MB RAM

HP LASERJET 4 PLUS £935

HP LASERJET 4M PLUS £1265

HP DUPLEX UNIT £499

3 YEAR ON-SITE  
WARRANTY £155



HP DESKJET 540

## HP DESKJET 850C

- 800 x 600 dpi in black
- Up to 6 pages per minute in black
- 45 TrueType fonts

HP DESKJET 850C £399

## NEW! HP DESKJET 540

- 600 x 300 dpi in black
- Up to 3 pages per minute
- 100 sheet paper handling
- 3 year warranty

HP DESKJET 540 £199

COLOUR KIT UPGRADE £32

## HP LASERJET 4V

- A3 paper handling
- 8 pages per minute in A3, 16 in A4

HP LASERJET 4V £1375

HP LASERJET 4MV £1995

HP LASERJET 4V 500

SHEET TRAY SYSTEM £279

3 YEAR ON-SITE  
WARRANTY £199



HP DESKJET 1600C

## PRINTER ACCESSORIES FEATURE

### TONER CARTRIDGES

|               |     |   |      |
|---------------|-----|---|------|
| CANON         |     | NEC   |      |
| LBP 4/4+      | £51 | NEC 610   | £79  |
| LBP 8III      | £52 | NECS60/60P/62P/90/95                                    | £108 |
| LBP 8IV       | £71 | HEWLETT PACKARD   |      |
| EPSON         |     | LaserJet II/III/III/III                                 | £47  |
| EPL 4100/4300 | £65 | LaserJet II IIP/IIIP+/IIIP                              | £46  |
| EPL5200       | £87 | LaserJet II III/4Si/4MX                                 | £77  |
| PANASONIC     |     | LaserJet II 4/4+/4M/4M+                                 | £67  |
| KX-P4410/4430 | £28 | LaserJet II 4L/4ML/4P/4MP                               | £44  |
| KX-P4420      | £26 | LaserJet II4V/4MV                                       | £115 |
| KX-P4450      | £18 | Drums and developers for Panasonic range also available |      |

### PRINTER SHARERS

TRUST AUTOSWITCH 2 £13

- Connects 2 computers to 1 printer

TRUST AUTOSWITCH 4 £27

- Connects 4 computers to 1 printer

AUTO SWITCHES

2 PCs to 1 printer £18

4 PCs to 1 printer £18

AUTO SWITCHES

- 256K buffer

4 PCs to 2 printers £127

### DESKJET CARTRIDGES

HP DESKJET BLACK

CARTRIDGE £16

HP DESKJET COLOUR

CARTRIDGE £19

### PRINTER CABLES

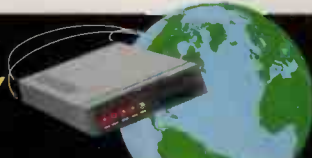
1.5m 3m 10m

PARALLEL £4 £8 £14

25 M - 25 M £4 £9 £15

25 M - 36 M £6 £8 £18

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- Full Internet connection • POP3 Email • Worldwide Web Browsing
- FTP • Telnet • Usenet • Many local points of presence
- On-line or telephone support • Free Internet guide



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## KYOCERA PRINTER FEATURE

### KYOCERA FS-400

A compact 4 pages per minute, low cost personal page printer that also offers full system printer capabilities and savings on print costs due to its cartridge-free design.

The FS-400 has a wealth of features, including 300 dpi resolution, enhanced to 300 x 1200 dpi by Kyocera resolution technology, 13 scalable in-built fonts, and for addition cost savings, Energy Star compliance and draft print mode.

Other features include industry standard LaserJet III and optional PostScript emulations, single and multi-protocol network connectivity expansion and full compatibility with Windows applications.

|                                     |      |
|-------------------------------------|------|
| KYOCERA FS-400                      | £499 |
| NETWORK-SPECIFIC ETHERNET INTERFACE | £279 |
| TONER KIT                           | £16  |
| 3 YEAR ECOSHIELD ON-SITE WARRANTY   | £150 |



KYOCERA FS-400

### KYOCERA FS-1550

The FS-1550 10 pages per minute printer offers substantial savings on running costs compared with competitive printers - where the ongoing cost of consumables can amount to far more than the purchase price.

It is ideal for word processing, database and spreadsheet printing, and with resolution enhancement, graphics. As your requirements grow, ECOSYS paper handling options include extra paper trays, a duplex unit and a sorter/collator.

Other features include industry-standard LaserJet III and optional PostScript emulations, sophisticated networking and IBM connectivity options, and full compatibility with Windows applications.

|                                     |      |
|-------------------------------------|------|
| KYOCERA FS-1550                     | £999 |
| NETWORK-SPECIFIC ETHERNET INTERFACE | £279 |
| TONER KIT                           | £51  |
| 3 YEAR ECOSHIELD ON-SITE WARRANTY   | £199 |



KYOCERA FS-1550



KYOCERA FS-1550 WITH ACCESSORIES

**ECOSYS**  
Printing costs. Stop paying the price.

## OKI PRINTER FEATURE

# OKI

### OL400ex Series 4 ppm Page Printers

Are you interested in LED/laser quality printing from a fast, four page per minute printer that takes up little more space on your desk than an A4 notebook? If so, you need look no further than the OL400ex series. Both the OL400ex and OL410ex are designed to sit discretely and quietly on any desktop.



OL400ex

### OL400ex

The ideal personal printer for use at home, in small businesses and large corporations.

- HP IIP compatible
- Serial and parallel interfaces
- 1MB memory (expandable to 5MB)
- Optional 2nd paper tray and multi-bin feeder
- Works in DOS applications where GDI printers fail
- Offers better print quality and lower running costs than Inkjets
- Small footprint
- 4 pages per minute
- 1 year on-site warranty

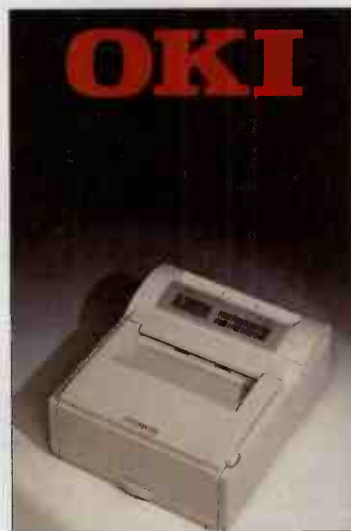
OKI OL400ex £279

### OL410ex

Ideal for business users in both the home and work environment providing high quality text and graphics.

- HP IIP compatible
- 1MB memory (expandable to 5MB)
- Serial and parallel interface with autoswitching
- Optional 2nd paper tray and multi bin feeder
- Fast throughput 4 ppm printer using a RISC processor
- Oki MicroRes 600 effectively gives 600 dpi
- 1 year on-site warranty

OKI OL410ex £379



OL410ex

### OKI DOT MATRIX MICROLINE PRINTERS

#### ML280

- 9 pin - 80 column
- short form tear off
- compact size
- bottom feed
- 300 cps super speed draft
- optional roll paper holder

### Technical Sales Order Lines

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(50 lines)

## PRINTERS

- HUGE STOCKS**  
guaranteed same day despatch on virtually all orders placed in up to 5.00pm.
- TECHNICAL SALES PEOPLE**  
Our sales people are the best. They are trained specialists in their chosen field - multimedia, memory of all types, mass storage, networking and communications.
- FINANCIAL STABILITY**  
Powermark plc has been supplying upgrades for over 4 years and has an annual turnover exceeding £17 million with a healthy balance sheet.
- LOW PRICES**  
We only supply products from leading manufacturers and at low, low prices too.
- TECHNICAL SUPPORT**  
Dedicated after sales technical support teams on line to help with installation.
- CORPORATE & PUBLIC SECTOR**  
We welcome orders from corporate, education and public sector organisations. Just fax or phone your order number.
- FULL MANUFACTURERS' WARRANTIES**  
All products supplied by Powermark plc carry manufacturers' warranties and of course full Powermark plc guarantees.

## TURN THE PAGE FOR MORE

- UPGRADE DRIVE THRU**  
While you wait installation service available. See page 3 for details.
- PERSONAL CALLERS**  
Save on delivery charges - there's plenty of parking. Telephone first to check our stock position on the items you want. We're open from 9.00am to 6.00pm Monday to Friday. Saturdays: Sales from 9.30am to 4.00pm, Technical Support and Customer Service from 10.00am to 2.00pm.

### Powermark plc

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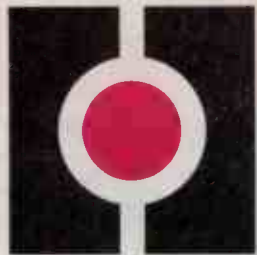
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Join for only £9.95 when you buy any modem from Powermark





## CD ROM DRIVES, SOUND CARDS AND SPEAKERS FEATURE

### SONY CD ROM DRIVES

- SONY CDU55E** £99
- IDE interface
  - Double speed

### PANASONIC CD ROM DRIVES

- 562B** £85
- Multisession internal drive
- CR 503** £169
- SCSI II double speed
  - 256K buffer
  - 320ms access time

### MULTIMEDIA KITS

- '95 PANASONIC BUNDLE** £239
- SoundBlaster 16 Value
  - Panasonic 563 CD ROM drive
  - Encarta '95, MS Publisher, Dangerous Creatures, MS Money and MS Golf
- '95 NEC BUNDLE** £479
- SoundBlaster 16 SCSI
  - NEC 3Xi CD ROM drive
- AZTECH SOUND GALAXY STELLAR MULTIMEDIA KIT** £179
- AZTECH EXPLORER PERSONAL SYSTEM** £249
- AZTECH EXPLORER PERSONAL SYSTEM DELUXE** £299

### PIONEER CD ROM DRIVES

- PIONEER DR-U104X** £279
- Quad speed, SCSI II
  - 614Kb/sec, 190ms access time
  - Works horizontally and vertically
- PIONEER DRM 602X** £439
- 6 disk magazine system
  - Double speed drive
  - Small footprint
  - Includes cables & supporting software
- PIONEER DRM 604X** £859
- 6 disk magazine system
  - Quad speed drive
  - 614Kb/sec transfer rate
  - 300ms access time
  - Small footprint
- PIONEER DRM 1804X** £1499
- 18 disk CD ROM drive

### MITSUMI CD ROM DRIVES

- FX300 TRIPLE SPEED INTERNAL** £149
- 450Kb/sec data transfer rate
  - 250ms access time
- FX400 QUAD SPEED INTERNAL IDE** £149
- 600Kb/sec data transfer rate
  - 230ms access time
  - 128K buffer



Public Sector customers can purchase through HMSO by calling 01603 694153.

### PLEXTOR CD ROM DRIVES

- PLEXTOR 6X CD ROM DRIVE** £Call
- 900Kb/sec data transfer rate
  - 145ms access time

### CD ROM ACCESSORIES

- CD SPEEDWAY** £39
- Increase the speed of your CD ROM drive by up to 1000%
- QUALITY DISK CADDY 10 PACK** £45
- CD ROM DRIVE LASER CLEANER** £24
- CD ROM DISK CLEANER KIT** £19
- REFILLS FOR ABOVE** £7
- CD TOWER STORAGE UNIT** £19

**FREE CD when you buy a CD ROM drive**

Titles may vary from time to time.

### SOUND BOARD SOFTWARE

- CREATIVE VOICE EDITOR** £37
- VOICE ASSIST MICROSOFT WINDOWS SOUND SYSTEM SOFTWARE** £47
- MIDISOFT SOUND IMPRESSION FOR WINDOWS** £45
- Play, record, edit and mix multiple sound files
- MIDISOFT MENTOR** £77

### VIDEO BOARDS

- REELMAGIC** £299
- Watch VideoCD's on your PC
  - Built-in 16-bit sound card
  - Includes bundled software
- REELMAGIC LITE** £239
- MOVIE MACHINE** £249
- 3 modules in 1:
  - Live overlay
  - TV-Tuner
  - Frame Grabber
- PC TELE VISION** £349
- ORCHID VIDIOLA** £259
- 30 frames per second
  - 3:1 on board compression
  - 800 x 600 non interlaced



### BEWARE

Beware of major incompatibility between CD ROM drives and sound cards. Powermark's specialists will 'multi-match' for you.

### SOUND BOARD HARDWARE

- ANALOGUE 'Y' CABLE** £8
- MIDI ADAPTER CABLE** £21
- MIDI ADAPTER 5 DELUXE** £45
- DESK MICROPHONE** £9
- HEADPHONES** £7
- 'PROFESSIONAL' HEADPHONES** £19
- ORCHID SCSI CHIP KIT** £22

### SPEAKERS

- Quality speakers supplied as matched pairs
- CREATIVE LABS SBS 300 STEREO SPEAKERS** £85
- 10 watts
  - Magnetically shielded
- CREATIVE LABS SBS 37 STEREO SPEAKERS** £24
- Magnetically shielded
- SCREENBEAT** £9
- Amplified with bass control
- POWERSOUND MAX SP30** £19
- With power adaptor
  - 2 watts per channel
  - Shielded, with volume control
- ALTEC ACS50** £69
- QUICKSHOT**
- SOUNDMATE 3** £15
- QUICKSHOT SOUNDMATE 4** £12
- ADD UP SS50 SPEAKERS** £32
- 8 watts
  - Built-in amplifier
- LABTEC CS-1000** £59
- 'Under Monitor' unit
- ALTEC ACS150** £99
- Powered sub woofer



- YAMAHA YST-M10** £59
- 10 watts per channel
  - 80Hz - 20KHz frequency response
  - Full magnetic shielding
  - Built-in power amplifier

### CREATIVE LABS PRO-DIGITAL SPEAKERS

- POWERCUT!** £28
- 4.5 watts per channel
  - Includes power adaptor

### SOUND BOARDS

- The widest range of Sound Boards
- Add a new dimension to business, education, training, MIDI, special needs and many more applications.
- Multimedia experts available for specialist advice

### ADAPTEC AUTOEDGE £169

- 16-bit record and playback
- GM compliant
- SCSI interface
- Wavetable synthesiser
- On-board DSP
- Bundled software

### AZTECH SOUND GALAXY PRO16 £65

### AZTECH SOUND GALAXY NOVA 16 EXTRA £79

### AZTECH SOUND GALAXY WAVERIDER 32+ £105

### AUDIOTRIX PRO £229

- Wavetable synthesiser
- 16-bit stereo record and playback
- On-board CD ROM instruments
- ADPCM compression software

### SOUNDWAVE 32 £148

### GAMEWAVE 32 POWERCUT! £102

### GRAVIS ULTRASOUND £99



### GRAVIS ULTRASOUND MAX £149

- 16-bit record and playback, 48KHz
- Multi CD ROM interfaces
- Dedicated digital sound processor

### PORTABLE SOUND PLUS POWERCUT! £109

- Plugs into parallel port
  - 16-bit stereo playback
  - Includes speaker unit
  - Suitable for MCA systems
- WAVJAMMER POWERCUT! £249**
- 16-bit PCM/IMA sound card
  - Includes MS Sound System



### DELIVERY CHARGES

SEE PAGE 11

**Technical Sales Order Lines**  
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(50 lines)

### NAKAMICHI CD ROM DRIVES

- NAKAMICHI MBR-7** £289
- 7 stack external device
  - Double speed
  - 300Kb/sec data transfer rate
  - 380ms access time
  - Can be used in conjunction with another SCSI CD ROM drive



### EARLY BIRD



**Order Bonus**  
See page 29 of this advertisement

**TURN THE PAGE FOR MORE**

### MEMORABLE

**Ha Ha GAGS**

Punchlines to old, old, old favourites

**It's the way you tell them... We have'n't heard that one before**

**Small checks**

**It's a jungle out there**

If you can't remember the stories to these then contact Quentin Quizzzy and he'll be happy to oblige.

**POWER THE NET!**



**Access the Internet through Powermark's PNet**

- Full Internet connection • POP3 Email • Worldwide Web Browsing
- FTP • Telnet • Usenet • Many local points of presence
- On-line or telephone support • Free Internet guide



# BANK at Powermark

## TRUST MULTIMEDIA FEATURE



### SOUND CARDS

#### SOUND EXPERT DE LUXE

- WAVE 32** £129
- ICS WaveFront Wavetable synthesizer for natural sound
  - 2MB instrument ROM
  - Recording Session Midi sequencer software included

### SPEAKERS

- DYNAMIC SOUNDWAVE 40** £30
- 15 watt (peak) power
- DYNAMIC SOUNDWAVE 30** £39
- 25 watt (peak) power



- DYNAMIC SOUNDWAVE 20** £44
- 25 watt (peak) power

- DYNAMIC SOUNDWAVE 10** £52
- 80 watt (peak) power



#### PCTV HOME

- VIDEO CARD** £159
- Watch television or video in a scalable window
- HOME CINEMA MODULE** £129
- Add-on to PCTV Card
- HOME TELETEXT MODULE** £39
- Connects to PCTV

## MIRO VIDEO FEATURE



TOP TECHNOLOGY FOR MULTIMEDIA, ANIMATION AND DIGITAL VIDEO

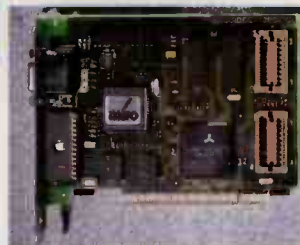


### miroVIDEO 20TD live!

- Desktop video and Windows Acceleration
- Provides video playback, TV Tune and first class entertainment software for channel selection, photo retouching and AVI post-editing
  - Live television on your PC
    - Captures full-size single frames and 320 x 240 full-motion video sequences
    - Full motion CD video playback

### miroVIDEO 12PD

- Video and MPEG playback on full screen in full motion
- Supports DCI
- Plug and Play
- Windows acceleration and TrueColor flicker free



### miroVIDEO 20SD TWIN

- Spread your Windows workspace across two monitors
- Two 64 bit graphics processors

- miroVIDEO 20TD live!** £345
- 1MB UPGRADE FOR 20TD** £49
- miroVIDEO 12PD** £129
- miroVIDEO DC1 WITH VIDEO STUDIO** £499
- miroVIDEO DC1 WITH ADOBE PREMIER** £599
- miroVIDEO DC1 pro** £851
- miroVIDEO 20PV avi** £375
- miroVIDEO MOUSE** £299
- miroVIDEO 20SD TWIN** £549

MULTIMEDIA EXPERTS AVAILABLE FOR SPECIALIST ADVICE

## DIAMOND MULTIMEDIA FEATURE

### DIAMOND 4000

- Quad speed CD ROM drive
- 16-bit, CD quality sound card, wave table upgradable
- Includes over 10 best selling software titles
- Premium stereo speakers, headphones and microphone
- Quick start video for easy installation
- Works with all SoundBlaster compatible games

**DIAMOND 4000 MULTIMEDIA KIT** £299

### DIAMOND 5000

- All features of the Diamond 4000 but with 30 software titles

**DIAMOND 5000 MULTIMEDIA KIT** £399

MULTIMEDIA EXPERTS AVAILABLE FOR SPECIALIST ADVICE



#### TITLES INCLUDED IN THE DIAMOND 5000

|  |                            |
|--|----------------------------|
| Myst   | Tass Times                 |
| Rebel Assault  | Bard's Tale                |
| Special Edition                                      | Wasteland                  |
| Sim City 2000  | Dragon Wars                |
| Mega Race  | Battle Chess               |
| Compton's Interactive Encyclopaedia                  | Lord of the Rings          |
| Where in the World is Carmen Sandiego?               | Castles                    |
| Family Doctor  | Star Trek 25th Anniversary |
| PC Globe Maps 'N' Facts                              | Out of this World          |
| Unnecessary Roughness                                | Doom                       |
| Hardball III   | Wolfenstein                |
| Jack Nicklaus Gold & Course Design Signature Edition | Blake Stone                |
| Mindshadow   | Duke Nukem I               |
|  | Duke Nukem II              |
|  | Oxyd                       |
|  | Raptor                     |
|  | Sango Fighter              |
|  | Biomenace                  |
|  | Astrofire                  |
|  | MasterMind                 |

### Technical Sales Order Lines

**0181-951 3355**  
(50 lines)

MULTIMEDIA

### HUGE STOCKS

Guaranteed same day despatch on virtually all orders placed even up to 5.00pm.

### TECHNICAL SALES PEOPLE

Our sales people are the best. They are trained specialists in their chosen field - multimedia, memory of all types, mass storage, networking and communications.

### FINANCIAL STABILITY

Powermark plc has been supplying upgrades for over 4 years and has an annual turnover exceeding £17 million with a healthy balance sheet.

### LOW PRICES

We only supply products from leading manufacturers and at low, low prices too.

### TECHNICAL SUPPORT

Dedicated after sales technical support teams on line to help with installation.

### CORPORATE & PUBLIC SECTOR

We welcome orders from corporate, education and public sector organisations. Just fax or phone your order number.

### FULL MANUFACTURERS' WARRANTIES

All products supplied by Powermark plc carry manufacturers' warranties and of course full Powermark plc guarantees.

**TURN THE PAGE FOR MORE**

### UPGRADE DRIVE THRU

While you wait installation service available. See page 3 for details.

### PERSONAL CALLERS

Save on delivery charges - there's plenty of parking. Telephone first to check our stock position on the items you want. We're open from 9.00am to 6.00pm Monday to Friday, Saturdays: Sales from 9.30am to 4.00pm, Technical Support and Customer Service from 10.00am to 2.00pm.

**Powermark plc**  
Premier House, 112 Station Rd,  
Edgware, Middlesex HA8 7AQ

**Tel: 0181-951 3355**  
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**Fax: 0181 905 6233**

**Email: sales@powermark.com**



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PNet specialists

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when you buy  
any modem from  
Powermark



# Power



## Mark®

**Technical Sales  
Order Lines  
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(50 lines)**



... and here's what some of our customers have said ...  
"I am pleased to say that the Conner drives are excellent. I would like to thank you for your very good technical help and support...  
...having found Powermark in a convenient spot for us and with easy parking (and good technical support!), we shall know where to come next time."

M J Richards,  
Herts

**TURN THE PAGE  
FOR MORE**



# MEMORY

## CREATIVE LABS FEATURE

### SOUNDBLASTER CARDS

**SOUNDBLASTER V.2 DELUXE VALUE EDITION** £33  
• Includes Indy 500 and Lemmings

**SOUNDBLASTER PACK** **POWERCUT!** £65  
• Includes SoundBlaster V.2 Deluxe, amplified speakers, joystick and software bundle

**SOUNDBLASTER PRO VALUE EDITION** £52

**SOUNDBLASTER AWE 32** **POWERCUT!** £169

- Next generation SoundBlaster card offering unbelievable sound quality
- E-mu Advanced WaveEffects Synthesis
- Full 16 channels, 128 instruments, 6 drum kits, 32 voice polyphony
- 16-bit stereo sampling and playback
- Real time hardware compression / decompression
- Microphone Included
- Comprehensive software bundle including Creative VoiceAssist, Creative TextAssist, WaveStudio, Creative Sound Panel, Creative Mosaic, Creative Ensemble and more



**SOUNDBLASTER PRO DELUXE PACK** £124

Includes SoundBlaster Pro card, dynamic microphone, amplified speakers, joystick and 1 in/1 out MIDI interface

**WAVEBLASTER II** £119

- Programmable Advanced WaveEffects generator



SOUNDBLASTER AWE32

**SOUNDBLASTER 16 MULTICD VALUE EDITION** £90

**SOUNDBLASTER 16 ASP MULTICD VALUE EDITION** £113

**SOUNDBLASTER 16 VALUE EDITION** £64

- 16-bit stereo sampling and playback
- 20 voice enhanced 4-operator stereo FM-synthesiser
- Power amplifier (4 watts per channel) and volume, bass and treble control
- Full software control of fade-in, fade-out, pan, volume, left/right steering and microphone mixing
- Bundled software



SOUNDBLASTER 16 VALUE EDITION

**ALL CREATIVE LABS PRODUCTS ARE 100% COMPATIBLE AND COME WITH A 2 YEAR GUARANTEE**



MULTIMEDIA OFFICE KIT

**MIDIBLASTER** £109

- For amateur and professional music composition and presentation
- 16 channels, 128 preset sounds, 33 preset effects, 55 preset drums
- Bundled software included

**SOUNDBLASTER 16 ASP SCSI VALUE EDITION** £134

- 16-bit real time compression/ decompression in hardware
- 20 voice enhanced 4 operator stereo synthesiser
- Bundled software included
- Includes EZ-SCSI software

### SOUNDBLASTER SOFTWARE

**SOUNDBLASTER DEVELOPERS KIT FOR DOS** £48

- Plays and records digitised voice from or to conventional memory and disk with start/stop, synchronisation, voice I/O looping control
- Plays synthesised music in the background and control start, stop, tempo and real-time transposition
- Converts English text strings to digitised speech

**SOUNDBLASTER DEVELOPERS KIT FOR WINDOWS** £48

### MULTIMEDIA KITS

**CD ROM UPGRADE KIT** £99

- Double speed CD ROM drive
- Aldus Photostyler
- Grolier Multimedia Encyclopaedia
- Cable

**GAMEBLASTER CD 16** **POWERCUT!** £229

- Includes Creative 563 internal double speed CD ROM drive, SoundBlaster 16, stereo speakers, joystick and comprehensive games bundle

### MULTIMEDIA KITS

**SOUNDBLASTER 16 MULTIMEDIA OFFICE KIT** **POWERCUT!** £385

- Includes multisession internal CD ROM drive, SoundBlaster 16 ASP
- MS Office Professional 4.3 on CD ROM comprising of Word 6.0, Excel 5.0, Powerpoint 4.0, Access 2.0
- MS Encarta, MS Sound System 2.0, Creative Voice Assist, Creative Text Assist, microphone and headphones



**CREATIVE LABS CRACKER PACK 3** £179

- Creative 563 internal double speed drive
- SoundBlaster 16
- Speakers
- Groliers Encyclopaedia, Aldus Photostyler
- Limited stocks

**EASY CD16 PRO** **POWERCUT!** £335

- Includes, Panasonic 563 External, SoundBlaster Pro 16, speakers, microphone and comprehensive software bundle

**SOUNDBLASTER CD 16** **POWERCUT!** £199

- Includes SoundBlaster Pro 16, double speed multisession internal CD ROM drive, amplified speakers and top selling CD titles

**DIGITAL EDGE 3X** **POWERCUT!** £389

- Includes NEC triple speed SCSI CD ROM drive, SoundBlaster 16 ASP SCSI, quality stereo speakers, microphone and extensive CD ROM bundle

**OMNI CD INTERNAL KIT** £139

**CD ROM INTERNAL UPGRADE KIT** £119





# BANK at Powermark

## CREATIVE LABS FEATURE



### VIDEO BOARDS

#### VIDEOBLASTER MP400 £199

- Displays full motion MPEG video in a scalable window up to full screen
- Overlays colour graphics and text on full-motion video
- Complies with MPEG1 levels and 1 and 2, VideoCD and White Book Video
- DOS and Windows drivers included

#### VIDEOBLASTER RT300 £275

- Intel i750PE chip inside
- Real time video capture and compression card

#### TV CODER INTERNAL £99

#### TV CODER EXTERNAL £139

#### VIDEOBLASTER FS200 £239

- Full screen playback
- Text and graphics overlay
- 30 frames per second
- Capture, freeze, store and manipulate images
- Includes Aldus Photostyler, Aldus Gallery Effects Vol. 1

#### 3DO BLASTER £299

- Full motion video
- Photo realistic graphics, images and video
- Control 3DO game play with voice, joystick or keyboard
- Requires CR-563 CD ROM drive and SoundBlaster with CD audio connector

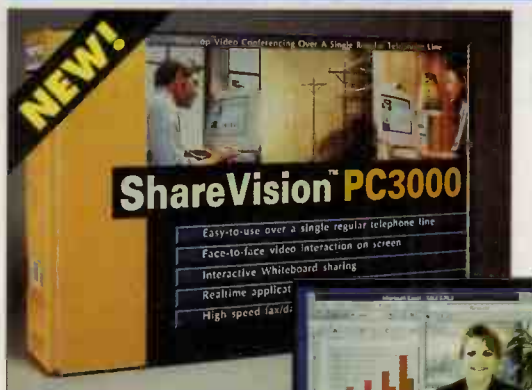
#### EXTERNAL SCSI CONNECTOR £39

- Add-on for SoundBlaster 16 SCSI card

- VIDEOSPIGOT £89  
VIDEOBLASTER SE £169
- Displays full-motion, digital video in a moveable, sizeable window

ALL CREATIVE LABS PRODUCTS ARE 100% COMPATIBLE AND COME WITH A 2 YEAR GUARANTEE

## SHAREVISION



#### PC3000

- Easy to use video conferencing over a single regular telephone line
- Face-to-face video interaction on screen
- Interactive Whiteboard sharing
- Realtime application sharing
- High-speed fax/data modem included

#### PC300

- Easy to use audio conferencing over a single regular telephone line
- Simultaneous voice and data
- Interactive Whiteboard sharing

## HAUPPAUGE FEATURE

### WIN/TV CELEBRITY

#### THE NEW GENERATION

...the best choice for Multimedia Video! Perfect colour digitising from Hauppauge.

Works with all VGA and SVGA cards up to 1280 x 1024 with up to 16.7 million colours, requiring no feature connector. No memory size limitations make the Win/TV Celebrity the easiest overlay/capture card to install.

- MAET technology support: on board motion artifacts elimination
- Fast 320 x 240 lossless AVI clip capture

- Integrated TV tuner/teletext
- Perfect colour: 4:2:2 YUV colour separations and S-Video support for high quality multimedia presentations
- Square Pixel (CCIR 601) support
- Teletext feature is Reuters 1000 ready, supporting dynamic data exchange (DDE) see page 876 on CNNtext, for updated news

#### WIN/TV CELEBRITY £275

Also available...

#### WIN/TV PRISMA £189

#### NEW VIDEO OUT MODULE FOR WIN/TV CELEBRITY £125



**FREE!** Buy WIN/TV CELEBRITY from Powermark and get OS/2 WARP FREE! (Voucher included with WIN/TV CELEBRITY)

## TOSHIBA CD ROM DRIVE FEATURE



TOSHIBA PARTNERS

### CD 952 PCMCIA CD ROM DRIVE

- Double speed
- Plug & play compliant
- 307Kb/sec
- Motorised tray
- Complies with PCMCIA 2.1

#### TOSHIBA CD 952 £299

### TOSHIBA 3501B CD ROM DRIVE

- Quad speed, multisession internal drive
- 155ns access time
- 256Kb continuous flow cache memory
- 614Kb/sec data transfer rate
- SCSI II interface
- Low power consumption
- Caddy loading

#### TOSHIBA XM3501B INTERNAL £239

#### TOSHIBA XM3501B EXTERNAL £305



TOSHIBA XM3501B

### TOSHIBA 3601B CD ROM DRIVE

- 4.4 speed SCSI drive
- 660Kb/sec transfer rate
- 130ms seek time
- 256Kb buffer
- White Book compliant
- Tray loading

#### TOSHIBA 3601B INTERNAL £245

#### TOSHIBA 3601B EXTERNAL £329

### Technical Sales Order Lines

**0181-951 3355**  
(50 lines)

MULTIMEDIA

**HUGE STOCKS**  
Guaranteed same day despatch on virtually all orders placed even up to 5.00pm.

**TECHNICAL SALES PEOPLE**  
Our sales people are the best. They are trained specialists in their chosen field - multimedia, memory of all types, mass storage, networking and communications.

**FINANCIAL STABILITY**  
Powermark plc has been supplying upgrades for over 4 years and has an annual turnover exceeding £17 million with a healthy balance sheet.

**LOW PRICES**  
We only supply products from leading manufacturers and at low, low prices too.

**TECHNICAL SUPPORT**  
Dedicated after sales technical support teams on line to help with installation.

**CORPORATE & PUBLIC SECTOR**  
We welcome orders from corporate, education and public sector organisations. Just fax or phone your order number.

**FULL MANUFACTURERS' WARRANTIES**  
All products supplied by Powermark plc carry manufacturers' warranties and of course Powermark plc guarantees.

**TURN THE PAGE FOR MORE**

**UPGRADE DRIVE THRU**  
While-you-wait installation service available. See page 3 for details.

**PERSONAL CALLERS**  
Save on delivery charges - there's plenty of parking. Telephone first to check our stock position on the items you want. We're open from 9.00am to 6.00pm Monday to Friday. Saturdays: Sales from 9.30am to 4.00pm, Technical Support and Customer Service from 10.00am to 2.00pm.

**Powermark plc**  
Premier House, 112 Station Rd, Edgware, Middlesex HA8 7AQ

Tel: 0181-951 3355 (50 lines)

Fax: 0181 905 6233

Email: sales@powermark.com

VISA MasterCard

Cards are not debited until despatch  
VAT at 17.5% will be added to all prices

**POWER THE NET!**

**RATES**  
£12.50 once-only membership  
£15 per month subscription  
ABSOLUTELY NO OTHER HIDDEN SERVICE CHARGES  
Quit at any time without penalties

Call 0181-951-3355 and ask for our PNet specialists

Join for only £9.95 when you buy any modem from Powermark



# Power



# Mark®

**Technical Sales  
Order Lines**  
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**(50 lines)**

## BUNDLE OFFERS!

Purchase any  
CD ROM drive from  
Powermark and take  
advantage of these  
very special offers:

|                                |     |
|--------------------------------|-----|
| 10 CD Megapak                  | £21 |
| Hands of Fate                  | £12 |
| UFO                            | £12 |
| Day of the Tentacle            | £13 |
| Microcosm                      | £9  |
| Rebel Assault                  | £19 |
| Bloodnet                       | £12 |
| World Atlas V5                 | £13 |
| Beneath a Steel Sky            | £15 |
| Seventh Guest                  | £12 |
| Compton's<br>Encyclopaedia '95 | £18 |
| Aesop's Fables                 | £7  |
| Our Century: Sport             | £8  |
| Our Century: Science           | £8  |
| Reference Library              | £8  |



Certificate no. FS 26535

**TURN THE PAGE  
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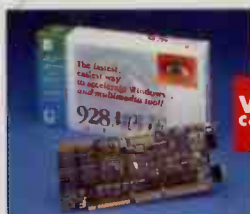
## MEMORY TUNES

**Memory** Elaine Paige  
**Laser Love** T Rex  
**How Much is That  
Doggy in the  
WINDOW** Lita Roza



# MEMORY

## VIDEOLOGIC FEATURE



### 928MOVIE

- Up to 6x performance over ordinary SVGAs
- Up to 1280 x 1024 resolution. Up to 16.7 million colours
- Postage stamp-sized video clips become high quality full screen movies

ISA 1MB

928MOVIE **POWERCUT!** £189

928MOVIE with sound £249

VLB 1MB

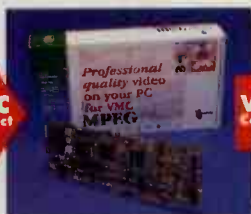
928MOVIE £189

928MOVIE with sound £249

**NEW!** 928MOVIE with MPEG £429

*"VideoLogic 928Movie is an indispensable asset to any truly usable multimedia system."*

PC Magazine, June 1994

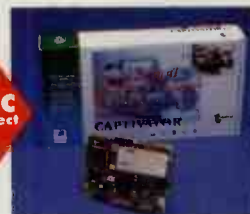


### MPEG PLAYER

The quality solution for Video CD playback

- Exceptional quality video/audio playback of Video CD, CD-i and interactive CD ROM titles
- Video playback at up to 30 frames per second
- Full support for application developers via MCI
- Connects to the 928Movie/PCIMovie card via the VESA media channel connector
- Requires 928Movie or PCIMovie

MPEG PLAYER £229



### CAPTIVATOR PRO TV

Sensational quality video and TV

- Exceptional quality live TV in a window
- Captures stills and video to your PC from any source such as a camcorder or VCR
- High quality stills and video capture with full picture control
- Connects to the 928Movie/PCIMovie card via the VESA media channel connector
- Requires 928Movie or PCIMovie

CAPTIVATOR PRO TV £219

CAPTIVATOR PRO £189



### CAPTIVATOR

Low cost Video for Windows capture card

- Single slot solution for PC's with spare ISA slot
- Quality stills and video capture from your camcorder or VCR
- Includes full version MS Video for Windows
- No feature connector required

CAPTIVATOR £164

*"The 928Movie is a very impressive card indeed. It proved miraculously easy to set up...and gave remarkable video acceleration."*

PC Direct, October 1994

*"928Movie is very fast, has the latest VM-Channel connection and is good value. This is a card to consider seriously."*

Personal Computer World  
July 1994

## PCIMOVIE

Super fast graphics for PCI machines

- All the benefits of 928Movie but with even faster windows acceleration

- Weitek P9100 graphics processor - 16 times faster than SVGA
- 2MB high speed VRAM

PCIMOVIE £329

## PHILIPS AND TELEVIDEO FEATURE

### TELEVIDEO SOUND CARDS

TELEWAVE AUDIO 32 £139

- DSP wavetable and FM synthesis
- 32 polyphony for multiple instrument sounds
- Stereo sampling rates from 4KHz to 44.1KHz
- Supports 16 MIDI channels
- 4 operator FM synthesis with 20 voice channel
- "True-to-Life" reproduction of real instrument sounds
- 16-bit, CD-quality stereo sound
- 128 general MIDI instruments with 51 drum kits
- 100% compatible with all major audio standards
- Multiple CD-ROM drive interface built-in: IDE, Sony, Mitsumi and Panasonic

### FEATURED BONUS SOFTWARE

- EASYSTART
- AUDIOSTATION
- MIDI ORCHESTRATOR PLUS
- WINDAT
- MONOLOGUE
- TALK-TO-TALK PLUS

## PHILIPS

### PHILIPS CM207 CD ROM DRIVE

#### THE POWER INSIDE

Inside the CM207 Philips have incorporated the most accurate laser optics available along with amazing, Advanced Error Correction technology. These cutting edge components and algorithms optimize the drive for years of reliable performance regardless of disc contaminations such as dust or fingerprints. Through an oversize memory buffer, the CM207 intelligently manages the data stream to the computer and maximizes the uninterrupted transfer of information at a minimum use of the computer's CPU power.



Public Sector customers can purchase through HMSO by calling 01603 694153.

**FREE CD when you buy a CD ROM drive**  
Titles may vary from time to time.



- Dual speed
- IDE ATAPI interface
- Can be used as slave device on IDE
- Power assisted tray
- Multisession
- 12 month warranty

PHILIPS CM207 INTERNAL £94



SEE PAGE 11

## Save £8

BUY TELEWAVE AUDIO 32 & PHILIPS CM207 INTERNAL for £225

## EARLY BIRD

**Order Bonus**  
See page 29 of this advertisement

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Access the Internet through Powermark's PNet

- Full Internet connection • POP3 Email • Worldwide Web Browsing
- FTP • Telnet • Usenet • Many local points of presence
- On-line or telephone support • Free Internet guide



## NEC CD ROM DRIVE FEATURE

# NEC

### NEW! NEC CDR 271 CD ROM DRIVE

- New low cost quad speed drive
- Enhanced, fast IDE interface
- 250ms average access time
- 600Kb/sec transfer rate
- Internal device
- Digital audio output



### NEC CD ROM DRIVES

|                         | Speed  | Bare | ISA Kit | Advanced<br>ISA Kit |
|-------------------------|--------|------|---------|---------------------|
| MULTISPIN 2Xc EXT       | DOUBLE | £339 |         |                     |
| MULTISPIN 3Xi INT       | TRIPLE | £219 | £269    | £322                |
| MULTISPIN 3Xp+ PORTABLE | TRIPLE | £249 | £309    | £359                |
| CDR 271 INT             | QUAD   | £159 |         |                     |
| MULTISPIN 4Xi INT       | QUAD   | £255 | £299    | £359                |
| MULTISPIN 4Xe EXT       | QUAD   | £385 | £439    | £499                |

### NEC MULTISPIN 3Xi

- MPC I & II formats
  - 256K cache
  - 195ms average access time
- INCLUDES MICROSOFT  
ENCARTA 95**

**12 month warranty on  
NEC CD ROM drives**

### NEW! NEC MULTISPIN 3Xp+

- 500Kb/sec sustained data transfer rate
- 240ms average access time
- Full function control panel
- Also available with Parallel to SCSI kit



### NEC MULTISPIN 4Xi & 4Xe

- New quad speed SCSI drive
  - 600Kb/sec sustained transfer rate
  - 220ms average access time
  - 256K continuous flow cache
  - White book compliant
- INCLUDES MICROSOFT  
ENCARTA 95**

## PC GUARDIAN FEATURE

### PC Guardian

#### SECURITY PRODUCTS

A complete range of security devices to safeguard your notebooks, PC's and data.

#### FLOPPY DRIVE LOCK

Installed in any 3.5" drive in seconds.

#### MODEL 7350 FLOPPY

DRIVE LOCK  
10 PACK

£14.95  
£139.50

#### NOTEBOOK PROTECTION

Secures all notebooks with 3.5" drive. Complete with 5' security cable, disk drive lock, two keys and carrying case. Installed and removed in seconds.

#### MODEL 7350+ NOTEBOOK PROTECTION £34.95 ENCRIPTION PLUS

Software automatically encrypts/ decrypts data and prevents unauthorised access  
ENCRIPTION PLUS £45



#### ANTI-THEFT KIT

Secures all PC's, monitors, keyboards and external drives. Each kit contains 3 - 3"x3" Perma Plates (2,000 PSI), 6' security cable, case-hardened padlock and two keys.

#### MODEL UT36 - ALL PURPOSE ANTI-THEFT KIT £25.95 10 PACK £239.50

**IT SECURITY EXPERTS  
AVAILABLE FOR  
SPECIALIST ADVICE**

## VIDEO TRAINING FEATURE

High quality 50-80 minute videos presented by two experts who talk you through key functions of software, step by step. Screen shots of the tasks in hand provide a clear explanation of how to use your software.

### BEGINNERS GUIDES

Windows 3.1  
Access 2.0  
DOS 6.0  
WordPerfect 6.0  
WordPerfect for Windows 6.0  
Lotus 1-2-3 (any DOS version)  
Corel Draw 4.0

### ADVANCED GUIDES

Windows 3.1  
DOS 6.0  
Access 2.0  
WordPerfect 6.0  
WordPerfect for Windows 6.0  
Lotus 1-2-3 V4.0 for Windows  
Excel 5.0  
Harvard Graphics 3.0  
Harvard Graphics for Windows  
Corel Draw 4.0



### NETWORK GUIDES

Installation Guide to using  
Network 4.X  
Set-up Guide to using  
Network 4.X  
Using Network 4.X Security  
Using Network 4.X  
Administration Vol 1  
Using Network 4.x

### INTRODUCTORY GUIDES

Word 6.0 for Windows  
Excel 5.0  
Harvard Graphics 3.0

**ALL TITLES AT £19  
OR BUY 3 FOR ONLY £49**

### OTHER TITLES

Using Visual Basic for Access  
Hints & Tips to Windows 3.1  
Secrets & Timesavers to Word  
6.0 for Windows  
Desktop Publishing to Word 6.0  
for Windows  
Hints & Tips to WordPerfect 6.0  
Using WordPerfect 6.0 for DTP  
Secrets, Hints & Tips for  
WordPerfect for  
Windows 6.0

WordPerfect for  
Windows 6.0 DTP  
Excel 5.0 Macros  
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Using Visual Basic for Excel  
Programming in C++  
C Volume 1  
C Volume 2  
Interrogation to Corel Draw 4.0  
Communicating with Internet

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& TRAINING**

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Our sales people are the best.  
They are trained specialists in  
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communications.

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Powermark plc has been supplying  
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£17 million with a healthy  
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**LOW  
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We only supply products from leading  
manufacturers and at low, low prices  
too.

**TECHNICAL  
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Dedicated after sales  
technical support teams on  
line to help with installation.

**CORPORATE &  
PUBLIC SECTOR**  
We welcome orders from  
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**FULL MANUFACTURERS'  
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All products supplied by Powermark  
plc carry manufacturers' warranties  
and of course full Powermark plc  
guarantees.

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available. See page 3 for details.

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you want. We're open from 9.00am  
to 6.00pm Monday to Friday.  
Saturdays: Sales from 9.30am to  
4.00pm, Technical Support and  
Customer Service from  
10.00am to 2.00pm.

**Powermark plc**  
Premier House, 112 Station Rd,  
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(50 lines)

**Fax: 0181 905 6233**

**Email: sales@powermark.com**

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only £9.95  
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any modem from  
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**Technical Sales  
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(50 lines)**

## EARLY BIRD



**Catches the  
ROM!**

**MICROSOFT  
CD ROM SAMPLER  
WITH EVERY  
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PLACED**

**BEFORE 1.00PM**  
Feature packed with  
samples from Encarta,  
Space Simulator,  
Cinemanía, Art Gallery,  
Strauss, Bookshelf,  
Dinosaurs and 35 more.

When ordering just  
ask for your **FREE**  
Microsoft Sampler CD  
ROM as it is not  
shipped  
automatically.

**HURRY!  
STOCKS ARE VERY  
LIMITED**

**TURN THE PAGE  
FOR MORE**

## MEDIA MOMENTS

Famous media  
moments...

"Read my lips"  
**George Bush**

"You've never  
had it so good"  
**Harold  
Macmillan**

"He would say  
that wouldn't be"  
**Mandy Rice-Davies**

## Microsoft®



### ENCARTA 1995

Microsoft Encarta '95 has been extensively updated with new and up to date content. Encarta '95 contains a wealth of new features that make it easier to quickly find the information that you need.

- New 40 country fact boxes, covering climate, religion, economy, geography, musical styles and more
- Over 9 million works, 8,000 photographs, 300,000 links, 26,000 articles and over 15,000 multimedia elements with 100 minutes of video and animation
- Stunning animations, videos, maps, charts, sounds and pictures bring information to life

**Special £30 cash back offer for  
owners of previous versions**

### GAHAN WILSON'S ULTIMATE HAUNTED HOUSE

- A scary, fun game full of scary sounds, animations and video for children to play. They can meet Frankenstein, good and bad ghosts, a two-headed monster and more!

### CINEMANIA 1995

- New Cinemanía 1995
- Nearly 20,000 film reviews, 1,000 movie stills, 168 dialogue excerpts, and 139 tracks of film music
- Now includes 1994 films

### CHILDRENS SOFTWARE

|   |        |     |
|---|--------|-----|
| Creative Writer                             | floppy | £31 |
| Creative Writer                             | CD ROM | £31 |
| Fine Artist                                 | floppy | £31 |
| Fine Artist                                 | CD ROM | £31 |
| How the Leopard<br>Got his Spots            | CD ROM | £32 |
| Gahan Wilson's Ultimate<br>Haunted House    | CD ROM | £31 |
| Magic School Bus - Inside<br>the Human Body | CD ROM | £31 |
| Magic School Bus -<br>Solar System          | CD ROM | £31 |

**SOFTWARE WARRANTY**  
Do check compatibility before  
ordering. Faulty software  
replaced through Powermark  
Customer Service. Opened  
software cannot be returned.

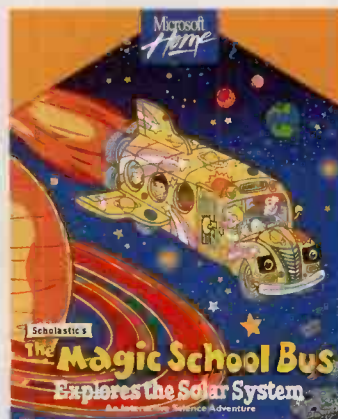
## MICROSOFT FEATURE

### MICROSOFT SCHOLASTIC MAGIC SCHOOL BUS SERIES

In our opinion, these new CD ROMs are just about the best educational titles available. A fully animated, interactive multimedia science adventure series for children aged 6-10. Inspired by Scholastic Inc's award-winning book series, these CD ROMs are designed to entertain and encourage a sense of adventure and exploration. They both feature the irrepressible science teacher, Ms Frizzle.

**MAGIC SCHOOL BUS - SOLAR SYSTEM  
MAGIC SCHOOL BUS - HUMAN BODY**

- Children can tour 12 different body parts



### REFERENCE AND EXPLORATION

|   |        |     |
|---|--------|-----|
| <b>NEW!</b> Cooking For Windows                           | CD ROM | £25 |
| <b>NEW!</b> Dogs For Windows                              | CD ROM | £25 |
| <b>NEW!</b> Explor Nature                                 |        |     |
| For Windows   | CD ROM | £24 |
| <b>NEW!</b> Wine Guide                                    | CD ROM | £25 |
| Encarta '95   | CD ROM | £59 |
| The Ultimate  |        |     |
| Frank Lloyd Wright  | CD ROM | £32 |
| Dangerous Creatures                                       | CD ROM | £32 |
| Ancient Lands   | CD ROM | £37 |
| Cinemanía '95   | CD ROM | £31 |
| <b>NEW!</b> Bookshelf '95                                 | CD ROM | £64 |
| Dinosaurs   | CD ROM | £31 |
| Art Gallery   | CD ROM | £33 |
| Musical Instruments                                       | CD ROM | £32 |
| Schubert  | CD ROM | £32 |
| Strauss   | CD ROM | £32 |
| Mozart  | CD ROM | £32 |
| Beethoven   | CD ROM | £32 |
| <b>NEW!</b> Composer Collection                           | CD ROM | £59 |
| • 3 CD ROM set includes Mozart,<br>Beethoven and Schubert |        |     |

### ENTERTAINMENT

|                                |        |     |
|--------------------------------|--------|-----|
| Space Simulator                | floppy | £29 |
| Arcade                         | floppy | £15 |
| Golf                           | floppy | £29 |
| Golf                           | CD ROM | £31 |
| Golf course - Mauna Kea        | floppy | £16 |
| Golf course - Pinehurst        | floppy | £16 |
| Golf course - Banff Springs    | floppy | £16 |
| Best of Entertainment<br>Packs | floppy | £16 |

## MICROSOFT MICE AND KEYBOARDS

### MICROSOFT MOUSE 2.0

£37

- Ergonomically designed for comfort
- Optimum hand position
- Teflon 'gliders' - moves smoother and swifter over any surface

New improved Intellipoint software gives you:

- Shortcuts - assigns common tasks to each button
- Both buttons - acts like an additional button to assign shortcuts
- Single click - click just one for double click
- Sonar - helps you find a lost cursor
- SmartSpeed - slows the cursor for added control

### MICROSOFT NATURAL

#### KEYBOARD

£68

- Unique contoured design - encourages a balanced, more natural hand and wrist position
- 104 key design - extra function keys
- IntelliType software - customisable for improved Windows based computing performance



### WIN A MICROSOFT NATURAL KEYBOARD

when you buy a Microsoft Mouse. 100 to be won by answering three simple questions and explaining why you would like a Microsoft Natural Keyboard. Details included with the Microsoft Mouse.

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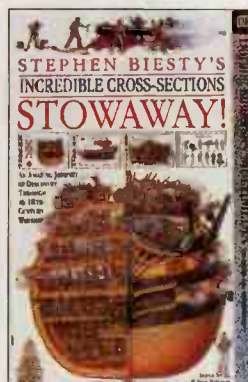
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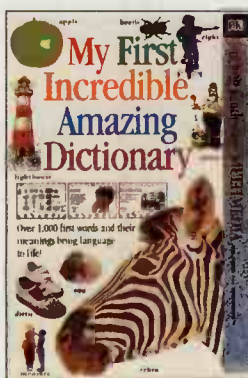
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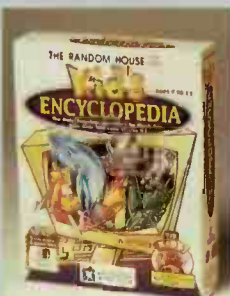
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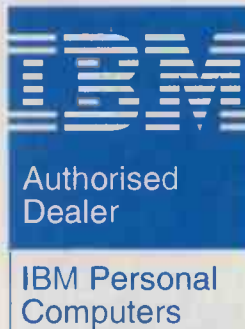
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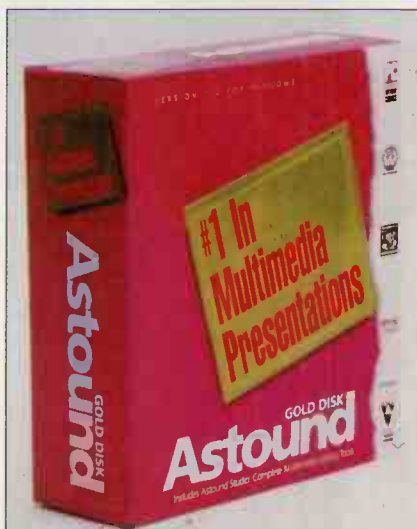
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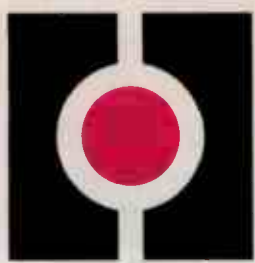
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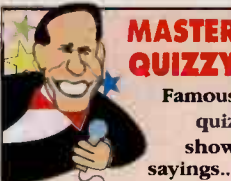


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| MS Works V3 WIN + Quicken V3 WIN    | £82  |
| MS Works V3 WIN CD                  | £82  |
| MS Works WIN 1 SL                   | £74  |
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| PerfectOffice Standard              | £179 |
| PerfectOffice Standard UP           | £149 |
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| Smartware II V2.6                   | £361 |

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| CA Supercalc WIN                | £65   |
| Lotus 123 V5 WIN                | £230  |
| Lotus 123 V5 WIN 1 SL           | £195  |
| Lotus 123 V4 DOS                | £288  |
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| Lotus 123 R2.4 DOS              | £247  |
| Lotus 123 R2.4 1 SL             | £212  |
| Lotus 123 R2.4 LAN Server       | £378  |
| Lotus 123 Go DOS                | £98   |
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| MS Excel V5 WIN 20 SL           | £Call |
| MS Excel V5 WIN UP CCP          | £85   |
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| Quattro Pro V6 WIN 3.5" + CD    | £157  |

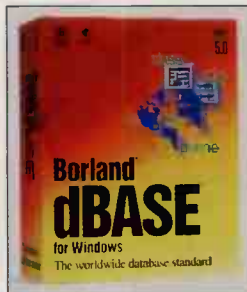
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| MS Access V2 WIN CCP UP         | £78   |
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| Paradox V5 WIN UP               | £118  |
| Superbase 95 WIN                | £239  |
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| Symantec Q&A V4.0 WIN           | £114  |

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| Avery Label Pro WIN          | £81  |
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| Calendar Creator V1 WIN      | £29  |
| Corel Flow                   | £49  |
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| Flowcharting 4 DOS           | £95  |
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| Perform Pro WIN              | £123 |
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| Intuit Quicken V6 DOS                  | £33  |
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| Sage Accountant Plus DOS V7            | £242 |
| Sage Accountant Plus LAN DOS           | £397 |
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| Sage Invoicing Add-On                  | £24  |
| Sage Instant Accounting WIN            | £87  |
| Sage Payroll II DOS V5                 | £135 |
| Sage Payroll II LAN                    | £166 |
| Sage +2 Payroll WIN                    | £130 |
| Tas Books Accounting                   | £79  |



## PROJECT MANAGEMENT

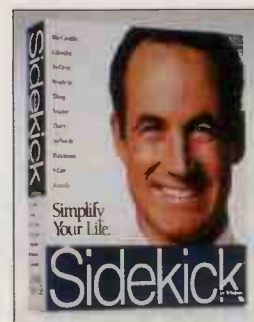
|                              |      |
|------------------------------|------|
| CA Super Project V3 WIN/OS/2 | £478 |
| MS Project V4 WIN            | £279 |
| MS Project V4 CCP UP         | £85  |
| MS Project V4 CUP Voucher    | £134 |
| On Target V1 WIN             | £65  |
| Project Scheduler V6 WIN     | £565 |

## KEY

|     |                     |
|-----|---------------------|
| CCP | Compliance Checking |
| CD  | Product CD ROM      |
| CUP | Competitive Upgrade |
| DOS | DOS Version         |
| LAN | Local Area Network  |
| MS  | Microsoft Product   |
| SL  | Site License        |
| UP  | Upgrade             |
| Vxx | Version             |
| WIN | Windows Version     |

## TIME MANAGEMENT

|                             |      |
|-----------------------------|------|
| 1st Act WIN                 | £79  |
| Act V2.1 DOS                | £195 |
| Act V2 WIN                  | £146 |
| CA Up To Date WIN           | £50  |
| Ecco Simplicity WIN         | £49  |
| Ecco Professional WIN       | £149 |
| Lotus Organiser V2.0 WIN    | £89  |
| Lotus Organiser V2.0 WIN UP | £49  |
| Lotus Organiser V2.0 WIN SL | £75  |
| MS Schedule+ WIN            | £87  |
| Maximizer WIN               | £225 |
| Polaris Packrat V5          | £173 |



|                                 |     |
|---------------------------------|-----|
| Sidekick V2 DOS                 | £55 |
| Sidekick WIN                    | £29 |
| Borland Sidekick with Dashboard | £39 |
| WP Infocentral WIN              | £56 |

## OCR

|                           |      |
|---------------------------|------|
| Omnipage Direct           | £78  |
| Omniscan WIN              | £275 |
| Omnipage Professional WIN | £365 |
| Pagekeeper V1.1 WIN       | £399 |
| Wordscan Plus OCR         | £390 |

## WORD PROCESSORS

|                                |      |
|--------------------------------|------|
| Lotus Ami Pro V3.1 WIN         | £89  |
| Lotus Write WIN v2             | £49  |
| MS Word WIN V6                 | £221 |
| MS Word WIN 1 SL               | £195 |
| MS Word V6 DOS                 | £172 |
| MS Word V6 WIN UP CCP          | £84  |
| MS Word V6.0 For Windows NT CD | £242 |
| Q&A Write V3 WIN               | £49  |
| SpellWrite WIN                 | £19  |
| Word For Word Prof DOS         | £65  |
| Word For Word Prof WIN         | £65  |
| WordPerfect 6.1 WIN            | £192 |
| WordPerfect V6 DOS             | £212 |
| WordPerfect V6 DOS 5 SL        | £829 |
| WordPerfect LetterPerfect DOS  | £29  |
| WordPerfect Grammatik 5 DOS    | £28  |
| WordPerfect Grammatik 5 WIN    | £28  |
| Wordstar V6 DOS                | £59  |
| Wordstar V7 DOS                | £223 |
| Wordstar V7 UP                 | £89  |
| Wordstar V2 WIN                | £29  |
| Wordstar Writing Tools         | £30  |

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If you could work anywhere you wanted, where would it be? Somewhere comfortable. Somewhere efficient. Organised. A place where you can relax and actually get some work done.

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- The best technical support available
- The most powerful custom development tools
- The first and only "create your own" suite

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- Quattro Pro 6.0
- Presentations 3.0
- Envoy 1.0a
- InfoCentral 1.1
- GroupWise 4.1

##### Special Introductory Offers

**PERFECTOFFICE STANDARD UPGRADE** £149

**PERFECTOFFICE TRADE UP** £179

Offers end 30th April 1995



#### WORDPERFECT 6.1

Introducing the first word processor that can actually make you a better writer. New WordPerfect 6.1. How? It's called PerfectSense - an amazing new technology that allows WordPerfect to make sense of what you write. In other words, it reads.

The Grammatik grammar checker can actually rewrite sentences for you. QuickCorrect corrects spelling, capitalisation and spacing errors as you type. So you don't have to take time to fix typos. And PerfectSense gives you Intelligent, Find and Replace, which changes all forms of one word to the equivalent forms of another, e.g "buy", and "bought" with "purchase", "purchasing" and "purchased".

Document Experts let you create fully formatted letters, memos, fax sheets and more, simply by filling in the blanks. Make It Fit Expert shrinks or expands a document to a specified number of pages. There is even an Expert that automates tables.

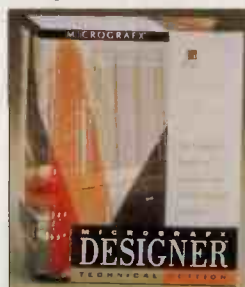
|                                     |      |
|-------------------------------------|------|
| <b>WORDPERFECT V6.1 WIN</b>         | £192 |
| <b>WORDPERFECT V6 DOS</b>           | £219 |
| <b>WORDPERFECT V5.1 + DOS</b>       | £219 |
| <b>WORDPERFECT V5.2 + WIN</b>       | £219 |
| <b>WORDPERFECT V6 5 LICENCE DOS</b> | £855 |

### DESKTOP PUBLISHING

|                                     |       |
|-------------------------------------|-------|
| Adobe Acrobat V2 WIN                | £150  |
| Adobe Acrobat Pro V2 WIN            | £415  |
| Adobe Acrobat Pro V2 for Workgroups | £1108 |
| Corel Ventura V5 WIN CD+3.5"        | £255  |
| Corel Ventura V5 CD                 | £199  |
| Corel Ventura V5 WIN CUP CD         | £119  |
| Designworks and Pressworks WIN      | £79   |
| First Press WIN                     | £25   |
| First Press DOS                     | £25   |
| First Design WIN                    | £25   |
| Info Publisher WIN                  | £145  |
| MS Publisher V2 WIN                 | £62   |
| PageMaker Classic WIN               | £49   |
| PageMaker V5 WIN                    | £410  |
| PageMaker V5 WIN 5 User             | £Call |
| Quark Xpress V3.3 WIN               | £565  |
| Serif Page Plus V3.0                | £45   |
| Serif Page Plus Publishing Suite    | £75   |
| Timeworks V3 DOS                    | £89   |

### GRAPHICS & DESIGN

|                               |      |
|-------------------------------|------|
| Adobe Illustrator V4 WIN      | £389 |
| Adobe Photoshop V3 WIN        | £456 |
| Corel Draw V3 WIN CD          | £51  |
| Corel Draw V3 WIN CD+3.5"     | £69  |
| Corel Draw V4 WIN CD+3.5"     | £115 |
| Corel Draw V4 WIN CD          | £95  |
| Corel Draw V3→V4 UP           | £135 |
| Corel Draw V5 WIN CD+3.5"     | £379 |
| Corel Draw V5 WIN CD          | £289 |
| Corel Draw V3→V5 UP           | £269 |
| Corel Draw V3→V5 UP CD        | £199 |
| Corel Draw V4→V5 UP           | £139 |
| Corel Draw V4→V5 UP CD        | £118 |
| Corel Photo-Paint 5 Plus CD   | £56  |
| Deluxe Paint II Enhanced      | £53  |
| Designworks WIN               | £64  |
| Designworks WIN CD            | £75  |
| Harvard Draw                  | £289 |
| Micrografx Graphics Works WIN | £79  |
| Micrografx Charisma WIN       | £181 |



|                                  |      |
|----------------------------------|------|
| Micrografx Designer V5 WIN       | £270 |
| Micrografx Draw WIN              | £66  |
| Micrografx Picture Publisher WIN | £279 |
| Micrografx Photomagic WIN        | £68  |
| Photofinish WIN                  | £55  |
| Photostyler V2 WIN               | £370 |

### PRESENTATION PACKAGES

|                                   |       |
|-----------------------------------|-------|
| Aldus Persuaslon V2.1 WIN         | £215  |
| Asymetrix Asymedia WIN            | £92   |
| Asymetrix Mediablitz V3 WIN       | £58   |
| Applause II V1.5                  | £275  |
| Harvard Graphics V3 DOS           | £275  |
| Harvard Graphics V2 WIN           | £92   |
| Harvard Graphics V3 WIN           | £149  |
| Harvard Graphics V2 WIN + Clipart | £145  |
| Harvard Graphics Presenters       | £169  |
| Harvard Spotlight WIN             | £89   |
| Lotus Freelance 2.1 WIN           | £259  |
| Lotus Freelance 4 DOS             | £249  |
| MS Powerpoint V4 WIN              | £224  |
| WordPerfect Presentations WIN     | £Call |

### CAD

|                   |     |
|-------------------|-----|
| Autosketch V3 DOS | £60 |
|-------------------|-----|



|                                      |      |
|--------------------------------------|------|
| Autosketch V2 WIN                    | £145 |
| Animator Pro                         | £345 |
| AutoCAD LT WIN                       | £359 |
| AutoCAD LT Int Architectural Library | £110 |
| DesignCAD 2D V6 DOS                  | £138 |
| DesignCAD 2D WIN                     | £138 |
| DesignCAD 3D V4 DOS                  | £191 |
| Drafix CAD Ultra DOS                 | £249 |
| Drafix Windows CAD V2.1              | £46  |

### NO GREY IMPORTS!

#### CAD

|                                 |      |
|---------------------------------|------|
| Drafix Windows CAD Prof         | £145 |
| Drafix WINCAD Architectural Lib | £118 |
| Drafix WINCAD Electrical Lib    | £118 |
| Drafix WINCAD Mechanical Lib    | £118 |
| Floorplan Plus 3D WIN           | £63  |
| Floorplan + 3D & 3D Design Plus | £109 |
| TurboCAD 3D V3.2 DOS            | £55  |
| TurboCAD WIN                    | £55  |



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Memorex

Who made the lemon squash?  
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# MEMORY

## SOFTWARE FEATURE

### Fonts and Clip Art

|  |      |
|--|------|
| Adobe Type Manager WIN                 | £52  |
| Adobe Plus Pack WIN                    | £107 |
| Adobe Streamline WIN                   | £141 |
| Bitstream Facelift WIN                 | £52  |
| Corel Artshow 3                        | £19  |
| Corel Artshow 4                        | £24  |
| Corel Artshow 5 CD                     | £24  |
| Corel Gallery                          | £27  |
| Fontographer WIN                       | £355 |
| GST Fonts (100) WIN                    | £15  |
| Key Clip Master Pro WIN CD             | £34  |
| Key Color Clipart (2550 images) WIN CD | £34  |
| Key Colour Photo Pro WIN CD            | £34  |
| Lotus Smartpics Freelance WIN          | £82  |
| MS TrueType Font Pack 1                | £46  |
| MS TrueType Font Pack 2                | £46  |
| WP Clipart Premium CD                  | £50  |
| WP Clipart Home WIN & DOS              | £22  |
| WP Clipart Office WIN & DOS            | £22  |

### Animation and Video

|                             |      |
|-----------------------------|------|
| Adobe Premiere WIN          | £399 |
| Add Impact WIN              | £79  |
| Animation Works Interactive | £88  |

### Navigation Packages

|                              |      |
|------------------------------|------|
| Autoroute Express GB DOS     | £49  |
| Autoroute Express Europe DOS | £55  |
| Autoroute Express GB WIN     | £73  |
| Autoroute Plus V7 GB DOS     | £219 |
| Autoroute Plus GB WIN        | £275 |
| Autoroute Plus GB WIN CD     | £348 |
| Autoroute Database Editor V6 | £92  |
| Autoroute Mapbase GB         | £288 |
| Nextbase Explorer DOS        | £65  |

**NO GREY IMPORTS!**

### ATTENTION VOLUME USERS!

#### SITE LICENSES AVAILABLE

Microsoft • Lotus • Borland • Corel • S&S • Novell • IBM

### UTILITIES

|   |      |
|---|------|
| 386 Max V7                              | £46  |
| After Dark V3 WIN                       | £24  |
| Colorado Backup WIN                     | £49  |
| Corel SCSI                              | £65  |
| Corel SCSI Network Manager              | £249 |
| Check It Pro                            | £59  |
| Check It Analyst WIN                    | £55  |
| CP Antivirus & Subscription DOS         | £59  |
| CP Antivirus & Subscription WIN         | £69  |
| CP Antivirus For Netware                | £463 |
| Delrina Flintstones Screensaver         | £19  |
| Delrina Far Side Screensaver            | £26  |
| Desqview 386 V2.6                       | £105 |
| Desqview V2.6                           | £59  |
| Dr Solomon Antivirus & Qtrly Update DOS | £59  |
| Dr Solomon Antivirus & Qtrly Update WIN | £71  |
| Dr Solomon Antivirus For Netware        | £240 |
| Fastback Plus V6 DOS                    | £75  |
| Fastback Plus WIN                       | £75  |

### UTILITIES

|                                     |      |
|-------------------------------------|------|
| First Aid for Windows               | £39  |
| More PC Tools DOS WIN               | £45  |
| MS Scenes Impressionist             | £16  |
| MS Scenes Outer Space               | £16  |
| MS Scenes Sierra Park               | £16  |
| MS Windows Printing System          | £83  |
| Norton Desktop V3 WIN               | £89  |
| Norton Desktop V1 DOS               | £49  |
| Norton Commander V4 DOS             | £54  |
| Norton Speedrive 4.0                | £55  |
| Norton Administrator for LAN 5 Pack | £299 |
| Norton DiskLock V3                  | £83  |
| Norton Utilities V8                 | £83  |
| Norton Utilities V8 UP              | £39  |
| Norton First Aid                    | £19  |
| Norton Editor 2.0 DOS               | £49  |
| Norton Antivirus V3 WIN & DOS       | £88  |
| Norton Antivirus For Netware        | £459 |
| Norton Backup 2.2 DOS               | £69  |
| Norton Backup 3.0 WIN               | £69  |
| On File for Windows                 | £39  |
| PC Tools V2 WIN                     | £49  |
| PC Tools Pro V9 DOS                 | £73  |
| Qemm V7.5 DOS WIN                   | £45  |
| Qemm V7.5 + Stacker V4.0            | £69  |
| Stacker V4 DOS WIN                  | £56  |
| Stacker V4 UP                       | £36  |
| Superprint V3.1                     | £79  |
| Star Trek Screen Saver WIN          | £32  |
| Systos Plus for OS/2                | £79  |
| Uninstaller WIN                     | £39  |
| Uninstall IT                        | £42  |
| WinDelete                           | £45  |
| WinProbe                            | £59  |
| Xtree Gold V3 DOS                   | £74  |
| Xtree Gold V4 WIN                   | £55  |
| Xtree Net V3                        | £259 |
| Xtree Tools For Network             | £369 |

## COREL FEATURE

### COREL DRAW

Corel DRAW 3 is the perfect entry-level graphics package

Corel DRAW 4 has all the power and modules of Corel DRAW 3 and Corel MOVE, OCR, multi-page layout, over 750 fonts and 18,000 clipart images and symbols.

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|                              |      |
|------------------------------|------|
| COREL DRAW 3 CD              | £51  |
| COREL DRAW 3 WIN CD          | £69  |
| COREL DRAW 4 WIN CD          | £115 |
| COREL DRAW 3 TO 4 UPGRADE    | £135 |
| COREL DRAW 5 WIN CD          | £289 |
| COREL DRAW 3 TO 5 UPGRADE CD | £199 |
| COREL DRAW 4 TO 5 UPGRADE CD | £118 |
| LEARNING COREL DRAW 5 CD     | £29  |

### NEW! COREL GALLERY 2

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Manager, 500 photos, 500 fonts, 75 sound clips, and 10 video clips.

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### COREL FLOW

Corel FLOW is the ideal tool for creating flowcharts, diagrams, schematics and more. It includes 2,000 symbols, thousands of clipart images and photos and 100 TrueType fonts.  
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### COREL VENTURA 5

Corel VENTURA 5 extends the boundaries of desktop publishing with an intuitive new interface and powerful architecture that supports both structured and freeform documents.

|                                 |      |
|---------------------------------|------|
| COREL VENTURA 5 WIN CD 3.5"     | £255 |
| COREL VENTURA 5 WIN CD          | £199 |
| COREL VENTURA 5 CUP WIN CD 3.5" | £145 |
| COREL VENTURA 5 CUP WIN CD      | £119 |

## NETWORKING

|                                |       |
|--------------------------------|-------|
| Intel LANdesk Manager 1 Server | £649  |
| Intel LANdesk Virus Protect    | £499  |
| Novell Personal Netware        | £44   |
| Novell Personal Netware 5 Pack | £195  |
| Novell Netware 3.12 5 User     | £385  |
| Novell Netware 3.12 10 User    | £905  |
| Novell Netware 3.12 25 User    | £1349 |
| Novell Netware 3.12 50 User    | £1825 |
| Novell Netware 3.12 100 User   | £2540 |
| Novell Netware 3.12 250 User   | £4575 |
| Novell Netware 4.1 CD 5 User   | £485  |
| Novell Netware 4.1 CD 10 User  | £1145 |
| Novell Netware 4.1 CD 25 User  | £1745 |
| Novell Netware 4.1 CD 50 User  | £2295 |
| Novell Netware 4.1 CD 100 User | £3385 |
| Novell Netware 4.1 CD 250 User | £5995 |
| Netware Connect 2 Port         | £279  |

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# Buyer's Charter

( M A I L O R D E R P R O T E C T I O N S C H E M E )



**H**ello, I'm Anthony George, your Customer Services Manager. My job is to assist you when things go wrong or

when you have a complaint in relation to the advertisements which appear in this publication. If you encounter such a problem, write to me with details of the exact nature of your complaint and I will contact you accordingly.

IT IS IMPORTANT THAT YOU FOLLOW MY TEN GUIDELINES, BELOW, AND RECORD DETAILS OF ALL TRANSACTIONS, ESPECIALLY IN THE EVENT OF CLAIMS UNDER THE "BUYER'S CHARTER".

## 1. Your Rights

1.1 Under the rules that control buying and selling of goods through the post, mail order customers are protected partly by law and partly by codes of practice drawn up by advertising agents and publishers.

1.2 By Law, advertisements or catalogues inviting people to order goods by post must include the supplier's name and operating address.

1.3 If money is sent with an order, it must be returned as soon as possible if the order is not accepted. A customer can sue if there is an unreasonable delay.

1.4 No contract exists until the supplier accepts an order. So the customer has no right to demand goods if the supplier chooses to reject his order and no right to compensation if he then has to pay more to buy the goods elsewhere.

1.5 But once the goods are sent, there is a binding contract. The customer is entitled to his or her money back if the goods do not correspond with their description. If their quality proves unsuitable for their normal purpose, the customer has the right to demand a replacement or refund.

1.6 In addition to any legal requirements the Advertising Standards Authority administers a code of practice which requires MAIL order suppliers who ask

for any money in advance to:

Provide samples of their goods at the address shown in the advertisement so that callers can examine them.

Refund payment in full if goods are returned UNDAMAGED within SEVEN days of receipt. (It is not necessary for the customer to give any reason for this.) The customer is entitled to try the goods during that period, unless the supplier has previously made it clear that a trial is not permitted — for example, when any use of the goods would make them unfit for sale to anyone else.

Send goods within TWENTY EIGHT days of receiving an order — or notify the customer within TWENTY EIGHT days, with a reply-paid postcard and the offer of a refund. If the customer prefers to wait for the goods he should be sent progress reports every FOURTEEN days.

## 2. The Product

Before placing an order, shop around and consider the software and configuration you need. If possible, test the product at a dealer's or at an exhibition, or read magazine reviews of current products. Don't be afraid to speak to manufacturers about parts and accessories, their compatibility with any equipment you already have and the possibility of expanding or upgrading in the future. There is no point buying hardware which will soon be obsolete or is incompatible with your own equipment and requirements. Check the manufacturer's maintenance or service contracts, in response times and any third-party involvement. Many companies offer a one-year maintenance contract, but who will be responsible when it runs out?

## 3. The Supplier

Make some enquiries about the company: you are entitled to check its financial status, trading record and customer references. Look at the returns and refund policy, warranty agreements, after-sales service and stock availability. Check its means of delivery and how soon it can dispatch. "ARE THERE ANY HIDDEN EXTRAS?"

## 4. Payment

You should not be charged for any goods until they are despatched and therefore whenever you can, always endeavour to pay on delivery or, failing this, collect them when you buy.

If this is not possible, consider carefully your method of postal payment. By far the greatest protection is afforded by a PERSONAL CREDIT CARD, for in the event of the supplier/advertiser ceasing to trade, or failing to deliver the goods, you are automatically covered under the credit card company's insurance scheme for all transactions in excess of £100.

Should you consider making a postal payment by "CHARGE CARD" you must check carefully with the CHARGE CARD COMPANY to ascertain if they operate a protection scheme similar to that offered by the PERSONAL CREDIT CARD company. INVARIABLY THEY DO NOT.

There is considerable confusion between a credit card and a charge card. Perhaps it would be as well before using a card which will be employed to make the payment to check with the issuing company whether you will be using credit card or a charge card.

If you pay by cheque, cross it, endorse it "Account Payee Only" and fill in all the details on the counterfoil, or payment list, in your cheque book.

If you pay by Postal Order, cross it, fill in the counterfoil and keep it with your record of the advertisement.

If a purchase has to be made with cash, always ensure that such a transaction is only undertaken in person, by you, at the supplier's/advertiser's address and that you take immediate possession of the goods you've paid for.

NEVER SEND CASH THROUGH THE POST

## 5. Ordering Goods

Do not place an order until you are sure that both the product and the supplier are reliable. Be precise about what you want: quote the model's make and number, the memory specifications and the hard disk size. With software, state the disk format



and support details you require. Check the total price of the goods (including VAT, postage and packing) and make sure there are no hidden extras. Use the Order form on the reverse side of the "Buyer's Charter" to record those items ordered, and your dealings with a supplier/advertiser.

## 6. Delivery

As defined under "YOUR RIGHTS" paragraph 1.5. The customer has a legal right to expect that the goods delivered correspond with the description advertised and in accordance with the order taken.

On delivery, check that the goods received do correspond accordingly, and if not, to notify the supplier/advertiser immediately.

## 7. Purchasing from Overseas Companies

The risks involved in buying from overseas nearly always offset the advantages. Don't consider it unless you cannot buy the product in the UK, or the price advantage is so great it outweighs all other considerations. If you still decide to purchase from overseas, make sure the product is suitable for use in the UK. Hardware has to be adaptable to 240 volts (in the US, 110) and hardware and software have to be configured correctly. It is essential that any software is supported by the manufacturer in the UK: most international versions are not. You should also know the supplier's exact terms of trade and what kind of support to expect. Returning hardware to the US, for example, can be expensive, time-consuming and risky.

Finally, you have to arrange for your goods to be shipped to the UK. Work out how and when they will be delivered, the cost of the exercise and who should insure the goods in transit. You will have to pay duty and VAT whether you clear them through Customs yourself or via a shipping agent.

## 8. Problems

In the case of even the smallest problem, CONTACT THE SUPPLIER FIRST. If you are dissatisfied after several attempts to get help, write to me, Anthony George, Customer Services Manager, at the address shown on page 8. If you paid by credit card, the card company should also be able to assist.

## 9. Price Fluctuations

Whilst every endeavour is taken to ensure that goods ordered correspond to

the prices advertised, there are occasions when, due to unforeseen circumstances, such as increases in manufacturing costs occurring during the period that copy was received and subsequently printed (6 to 8 weeks), a fluctuation in prices may be experienced.

Customers should always obtain from the advertiser/supplier a guarantee that

the price advertised still applies to any goods from which an order is to be placed.

## 10. Help Line

Always ensure when purchasing a PC or related equipment that you are fully protected and have access to a "HELP" line service.

# Personal Computer World Buyer's Charter

## 1. Private Individual Reader's Protection

When you purchase goods as a Private Individual Reader from a Great Britain Supplier's advertisement in PERSONAL COMPUTER WORLD and pay in advance of delivery to that Supplier who subsequently goes into receivership administration liquidation or bankruptcy or ceases to trade prior to delivery of the goods you may under the Buyer's Charter qualify for compensation from PERSONAL COMPUTER WORLD provided that you have:-

- (i) not had your money returned by the Supplier;
- (ii) have followed the PERSONAL COMPUTER WORLD guidelines when placing your order and have taken all reasonable steps to effect delivery or refund;
- (iii) have retained as proof and for verification purposes:-
  - (a) a copy of the original advertisement
  - (b) a copy of the PERSONAL COMPUTER WORLD Order Form
  - (c) comprehensive proof of payment

## 2. Claims

(a) Claims must be submitted in writing to the customer services manager of PERSONAL COMPUTER WORLD with full details of the claim not earlier than 28 days and not later than 3 months from the official sale date of the relevant issue of PERSONAL COMPUTER WORLD.

Claims received outside this period will not qualify under any circumstances for compensation under the Buyer's Charter. The official sale date of PERSONAL COMPUTER WORLD is the first Thursday of each month.

(b) Once a Supplier has become subject to insolvency proceedings or has ceased to trade, PERSONAL COMPUTER WORLD guarantees to process as expeditiously as possible any private individual reader's claim properly made and submitted.

(c) If there are insufficient tangible assets available processing of claims under the Buyer's Charter will commence immediately.

(d) If there are assets available and it has been confirmed that a dividend will be made then pending payment of a dividend claimants under the Buyer's Charter will receive compensation for any shortfall existing after the payment of such a dividend.

(e) Payments by PERSONAL COMPUTER WORLD will take into consideration and reflect on the rights the Private Individual Reader might have against third parties such as credit card or insurance companies.

(f) PERSONAL COMPUTER WORLD reserves the right to take an assignment of any claim made by a Private Individual Reader as a condition of making a payment under the Buyer's charter.

## 3. Limitations

(a) PERSONAL COMPUTER WORLD's Liability under the Buyer's Charter will not exceed £2,000 in respect of any claim submitted by any one Private Individual Reader and in any event will not exceed £100,000 in respect of claims submitted by any Private Individual Reader against all Suppliers in any one calendar year. Any additional payments by PERSONAL COMPUTER WORLD will be made entirely at the publisher's discretion.

(b) The Buyer's Charter only applies to advance payments made by Private Individual Readers and as a direct response solely to goods itemised in display advertisements in the magazine; it does not include goods purchased from classified advertisements, loose inserts, catalogues or other sales material obtained from any relevant advertiser.

(c) The Buyer's Charter is designed to safeguard the Private Individual Reader not companies, societies, organisations, unincorporated bodies or any other commercially orientated outlet of any description. There is no protection for goods purchased from outside Great Britain or goods purchased for resale.



**ALWAYS  
KEEP A COPY !**

## CUSTOMER DETAILS

COMPANY .....

NAME .....

SALESPERSON'S NAME .....

COMPANY .....

ADDRESS .....

ADDRESS \_\_\_\_\_

POSTCODE .....

..... POSTCODE .....

DATE OF TELEPHONE ORDER ..... / ..... / ..... TIME .....

DATE OF TELEPHONE ORDER ..... / ..... / .....

ORDERED BY: ☐ TELEPHONE ☐ FAX ☐ POST

ORDER REFERENCE NUMBER (IF QUOTED) .....

**ADVERT APPEARED IN PCW:**

DISPATCH REFERENCE NUMBER .....

ISSUE DATE ..... PAGE .....

[illegible]

## METHOD OF PAYMENT

☐ PERSONAL CHEQUE    ☐ PURCHASE ORDER    ☐ CREDIT CARD

☐ C.O.D    ☐ CHARGE CARD    ☐ OTHER (SPECIFY) .....

CREDIT CARD COMPANY ..... START DATE ..... / ..... / .....

CHARGE CARD COMPANY ..... START DATE ..... / ..... / .....

CARD NUMBER ..... EXPIRY DATE ..... / ..... / .....

CC BY-NC-SA

**SUB TOTAL**

## DISCOUNT

## CARRIAGE

## SURCHARGES

## VAT

**TOTAL**


## DELIVERY DETAILS

DELIVERED TO (ADDRESS)  
(IF DIFFERENT FROM ABOVE) .....

POSTCODE .....

AGREED DELIVERY DATE ..... / ..... / .....

 **TERMS OF WARRANTY**  **MONEY BACK**

 RETURNS POLICY  COST OF EXTENDED WARRANTY

HELPLINE

Details: .....

SIGNED ..... DATE ..... / ..... / ..... DAYTIME TELEPHONE NUMBER .....



# CAST IRON BACKUP

## Service

Specialists to assist in your selection - identify and match your requirements - ultimately this will save YOU time and money.

## Technical Support

Dedicated technical staff to assist in installation and after...

## The 3 e's Proven Track record

Experience and expertise in processing orders efficiently is reflected in our solid client base comprising of Universities, Government bodies, Financial Institutions, etc.

## Full Manufacturers Warranty

All products are authorised UK versions and carry a full manufacturers warranty.

## Overnight Delivery

All stocked orders are dispatched the same day. Delivery charged at £8 plus VAT.

## You Are The Final Judge

We have chosen with care, and we guarantee, you will be happy when you order from us. If you are not satisfied with your purchase for any reason, just return it to us within 14 days, and we will promptly exchange it or send you a refund as you request. Please contact our sales office.

Managing Director  
Computer Bits & PCs Plc

## Optical Drives

|   |                             | INT   | EXT   |
|---|-----------------------------|-------|-------|
| <b>FUJITSU</b>  |                             |       |       |
| M2512   | 230MB 3.5" Bare Drive       | £465  | £530  |
| <b>HEWLETT PACKARD</b>  |                             |       |       |
| C1716T  | 1.3GB MultiFunctional Drive | £1440 | £1622 |
| <b>PANASONIC</b>  |                             |       |       |
| LF-7300   | 1.5GB MultiFunctional Drive | £1510 | £1590 |
| <b>IBM XYRATLEX</b>   |                             |       |       |
| Includes SCSI terminator, software installation and user guides for the appropriate operating system. |                             |       |       |
| <b>IBM Xyratex</b>  |                             |       |       |
| X3000   | 230MB Unix version          |       | £805  |
| X3000PP   | 230MB Parallel Port Kit     |       | £782  |
| X3000DOS  | 230MB DOS/OS2 Kit           |       | £691  |
| X5000UN   | 1.3GB Unix Version          |       | £1890 |
| X5000DOS  | 1.3GB DOS/OS2 Kit           |       | £1787 |

## CD-ROM

|                |   | INT  | EXT  |
|----------------|---|------|------|
| <b>HITACHI</b> |   |      |      |
| CDR1950S       | SCSI-2 5MB/s transfer, 235ms access 256kb buffer bare unit  |      | £225 |
| CDR1950SY      | Specs as CDR1950S, Includes ISA Bus Kit cables and software |      | £367 |
| CDR1950SZ      | Specs as CDR1950S, Includes MCA Bus Kit cables and software |      | £440 |
| CDR1950PP      | Parallel Port Version                                       |      | £375 |
| CDR6550        | SCSI300kb/s 270MS access bare drive                         | £135 | £199 |

## PIONEER CD-ROMS

|                |  |  |      |
|----------------|--|--|------|
| <b>PIONEER</b> |  |  |      |
| DRU-104X       | 614kb/sec 190MS access bare drive                |  | £195 |
| DRM602X        | Six Disk Magazine system with double speed drive |  | £390 |
| DRM604X        | Six Disk Magazine system with quad speed drive   |  | £795 |

## Hard Drives

|  |        |        |       |
|--|--------|--------|-------|
| <b>SEAGATE 3.5" IDE (2 year warranty)</b>              |        |        |       |
| ST3660A  | 540MB  | 14MS   | £142  |
| ST3780A  | 730MB  | 12MS   | £199  |
| ST31220A   | 1.08GB | 12MS   | £282  |
| <b>3.5" SCSI (2-5 year warranty)</b>                   |        |        |       |
| ST5660N  | 545MB  | 12MS   | £219  |
| ST31230N   | 1.05GB | 9MS    | £375  |
| ST32430N   | 2.15GB | 9MS    | £745  |
| ST32550N   | 2.15GB | 8MS    | £795  |
| ST15150N   | 4.29GB | 9MS    | £1399 |
| ST15230N   | 4.3GB  | 10.5MS | £1200 |
| <b>CONNER 3.5" IDE (2 year warranty)</b>               |        |        |       |
| CFA540A  | 540MB  | 12MS   | £149  |
| CFA850A  | 850MB  | 12MS   | £247  |
| CFA1275A   | 1.27GB | 12MS   | £330  |
| <b>3.5" SCSI (2-5 year warranty)</b>                   |        |        |       |
| CFA540S  | 540MB  | 13MS   | £233  |
| CFP1060S   | 1.06GB | 9MS    | £426  |
| <b>IBM 3.5" SCSI (5 year warranty)</b>                 |        |        |       |
| PEGASUS  | 1.0GB  | 10MS   | £365  |
| 2000MB   | 2.0GB  | 9MS    | £719  |
| <b>5.25" SCSI (5 year warranty)</b>                    |        |        |       |
| 4000MB   | 4.0GB  | 9MS    | £1541 |
| <b>MICROPOLIS 3.5" SCSI (5 year warranty)</b>          |        |        |       |
| MIC4221  | 2.05GB | 8.5MS  | £690  |
| MIC3243  | 4.2GB  | 8.5MS  | £1180 |
| <b>5.25" SCSI</b>                                      |        |        |       |
| MIC1991  | 9.1GB  | 12MS   | £2049 |
| <b>AUDIO VISUAL DRIVES 3.5" SCSI (5 year warranty)</b> |        |        |       |
| MIC4221AV  | 2.05GB | 8.5MS  | £758  |
| MIC3243AV  | 4.2GB  | 8.5MS  | £1287 |
| <b>5.25" SCSI (5 year warranty)</b>                    |        |        |       |
| MIC1991AV  | 9.1GB  | 12MS   | £2090 |
| <b>HITACHI 3.5" SCSI (5 year warranty)</b>             |        |        |       |
| DK326  | 1GB    | 10MS   | £375  |
| <b>5.25" SCSI (5 year warranty)</b>                    |        |        |       |
| DK537  | 2.9GB  | 12MS   | £1470 |
| <b>HEWLETT PACKARD 3.5" SCSI (5 year warranty)</b>     |        |        |       |
| C3323A   | 1.05GB | 9.5MS  | £375  |
| C2490A   | 2.1GB  | 9MS    | £709  |



|   |        |       |       |
|---|--------|-------|-------|
| <b>QUANTUM</b>                                    |        |       |       |
| <b>3.5" IDE (2 year warranty)</b>                 |        |       |       |
| MV540AT   | 540MB  | 14MS  | £144  |
| LGT730AT  | 730MB  | 11MS  | £186  |
| <b>3.5" SCSI (2-5 year warranty)</b>              |        |       |       |
| LGT540  | 540MB  | 11MS  | £170  |
| LGT730  | 730MB  | 11MS  | £195  |
| ATL2150S  | 2.1GB  | 8.6MS | £752  |
| GPX4280S  | 4.28GB | 8.6MS | £1223 |
| <b>WESTERN DIGITAL 3.5" IDE (3 year warranty)</b> |        |       |       |
| AC2700  | 730MB  | 10MS  | £185  |
| AC3100  | 1GB    | 10MS  | £295  |
| <b>MAXTOR 3.5" IDE (3 year warranty)</b>          |        |       |       |
| 7420AV  | 420MB  | 11MS  | £144  |
| 7540AV  | 540MB  | 11MS  | £164  |
| 7850AV  | 850MB  | 11MS  | £235  |
| 71260AV   | 1.26GB | 11MS  | £344  |

# COMPUTER BITS & PCs PLC

## INVESTING IN SERVICE

## Tape Back Up

|   |   | INT   | EXT   |
|---|---|-------|-------|
| <b>DIGITAL AUDIO TAPE BACKUP (DAT)</b>          |   |       |       |
| <b>WANGDAT</b>                                  |   |       |       |
| 3100  | 2GB 4mm DAT   | £599  | £699  |
| 3200  | 2/8GB 4mm DAT   | £650  | £750  |
| <b>SONY</b>                                     |   |       |       |
| SDT5200   | 4GB 4mm DAT-DDS 2   | £575  | £649  |
| SDT5000   | 4/16GB 4mm DAT-DDS 2  | £620  | £705  |
| <b>EXABYTE</b>                                  |   |       |       |
| 8205  | 2.5 - 5GB 8mm   | £946  | £1046 |
| 8505XL  | 7 - 14GB 8mm  | £1550 | £1641 |
| <b>HEWLETT PACKARD</b>                          |   |       |       |
| HP 35470  | 2GB 4mm DAT   | £525  | £625  |
| HP 35480  | 8GB 4mm DAT   | £620  | £720  |
| C1533A  | 4-16 GB 4mm DAT-DDS 2   | £738  | £827  |
| C1553A  | 48GB Autoloader   | £1525 | £1625 |
| <b>HEWLETT PACKARD JETSTORE - EXTERNAL KITS</b> |   |       |       |
| 2000  | 2GB DAT System & Cheyenne Arcserve/solo software and ISA Host Bus Adaptor                       |       | £881  |
| 5000  | 4GB DAT System & Cheyenne Arcserve 4.0 Software (250 User Version) & ISA Host Adaptor           |       | £1573 |
| 6000  | 8GB DAT system & Cheyenne Arcserve version 5.1 software (250 user version) and ISA host adaptor |       | £1993 |

## JETSTORE 2000



|  |               |      |      |
|--|---------------|------|------|
| <b>HEWLETT PACKARD JETSTORE - BARE UNITS</b> |               |      |      |
| 2000   | 2GB DAT Drive | £616 | £755 |
| 5000   | 4GB DAT Drive | £705 | £805 |
| 6000   | 8GB DAT Drive | £850 | £950 |

## TAPE BACKUP

|   |                           |  |      |
|---|---------------------------|--|------|
| <b>COLORADO</b>   |                           |  |      |
| Trakker   | 340MB Parallel Port Drive |  | £225 |
| Trakker   | 680MB Parallel Port Drive |  | £315 |
| <b>TANDBERG DATA</b>  |                           |  |      |
| The range below includes Drive, Adaptec 1510 Controller, Data Cartridge (appropriate capacity) Firstserve Software, Cables and Installation Manual. |                           |  |      |

|         |                  |      |      |
|---------|------------------|------|------|
| FS 2501 | 250MB Tape Drive | £532 | £646 |
| FS525   | 500M Tape Drive  | £673 | £787 |
| FS1200  | 1.2GB Tape Drive | £797 | £910 |
| FS2000  | 2.5GB Tape Drive | £890 | £976 |

## Removable Storage

### MINISTOR PCMCIA - HARD DISKS

|          |                 |      |
|----------|-----------------|------|
| MP130P   | 130/260MB       | £293 |
| MP340P   | 171/340MB       | £320 |
| Cardwise | Docking Station | £205 |

(Docking Station enables migration of data between portables & desktops easily)

### MOUNTAINGATE - REMOVABLE HARD DISKS

|                 |       |  |       |
|-----------------|-------|--|-------|
| <b>Passport</b> |       |  |       |
| QP170           | 170MB |  | £422  |
| QP240           | 270MB |  | £530  |
| QP525           | 525MB |  | £1045 |

Internal & External Kits available for the Above.

TEL. 0171-359 8898 FAX. 0171-359 1812

**COMPUTER**  
BITS & PCs PLC

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# Personal Computer World

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| Apricot (UK) Ltd                 | (plus Bound in Insert) 420/421 |
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| House of CD ROM                | 495                       |
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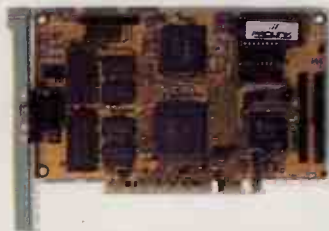
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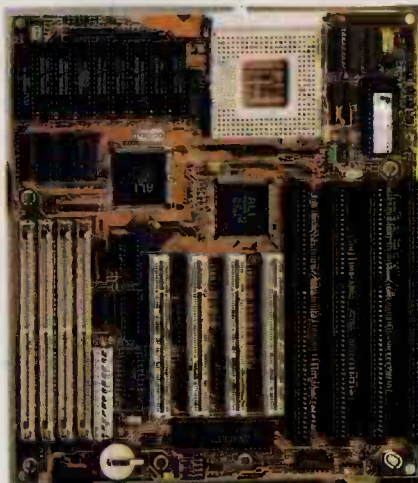
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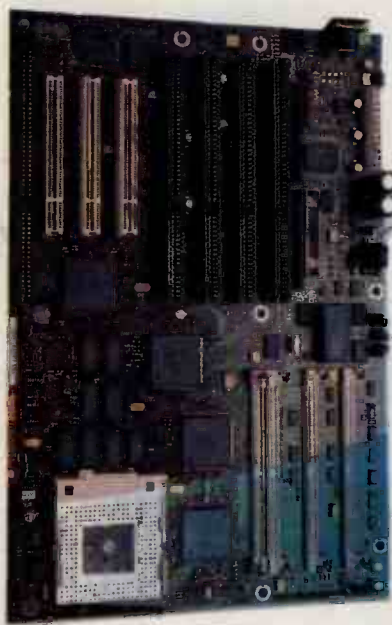
(With cash discount)

**Components:** SIMs, CPUs, Disc Drives, Modems, Scanners, Monitors, Printers.  
**Local Area Networks:** Novell, Personal Netware, Windows for Workgroups.  
**Services:** Installation, configuration, repairs, upgrades. Labour: £10/H + VAT.

## Intel PREMIER OEM mainboards With P60/P66/P90 Pentiums

Intel OEM mainboard with 2 serial,  
1 parallel, 2 IDE buses onboard.  
AMI BIOS on flash E2PROM.  
4 72-SIM slots (up to 128MB RAM),  
3 PCI slots and 5 ISA slots.  
256K cache (not upgradable).

With P60 CPU:..... £510.  
With P66 CPU:..... £580.  
With P90 CPU:..... £690.



Intel Premier P60 Pentium board.

### Buy with confidence:

Solidisk has a track record of 13 years in business  
with a reputation for excellent local services  
supplying all the latest from all the big names  
with impartial advice, on site installation,  
maintenance and upgrade facilities.

**COMPAQ, IBM, HP, CANON, TOSHIBA**



We supply from chips to systems.

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One call does it all!

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## ChipChat

● Chris Bakolas, technical director of Dan Computers, demonstrated recently that sexism is alive and well in the computer industry. He phoned PCW's senior staff writer, Chris Cain, to express his concern that a woman (Eleanor Turton-Hill) would be testing the machines in a forthcoming PC group test. "I just wanted to know if she's qualified," he said.

For your information, Chris, Eleanor has a degree in humanities, an MSc in Computer Science, and has worked as a software consultant and as a database developer before joining PCW as staff writer a year ago. Of course, none of this actually proves anything, but she does play a mean game of Tetris...

● A reader has told us how, fearing a break-in, he stashed his brand new £900 laptop among the pots and pans at the bottom of his oven when he went out. You guessed it: he came home, forgot about the laptop, and shoved a chicken in the oven. "The laptop melted before I realised what I had done," he said. Must qualify as one of the great, er, fowl-ups of our time...

● Dell delighted 15 journalists when it hosted a trip to Paris to discuss the future of portable computing. In true journo tradition, however, more time was spent passing judgement on fine wine and French food than nifty notebooks.

Former PCW editor, Guy Swarbrick, who now works at Dell, had another reason for being there: to prove that British citizens could travel around Europe without a passport. How we laughed when he was escorted from the Eurostar train carriage by passport officials when he tried to pass off his driving licence as proof of ID...

● Precision, that's what we like to see. While playing with the latest version of Ameol we spotted this gem in the accompanying readme file: "The CIX clock is set from an atomic clock and is guaranteed to be accurate to 1 minute."

● Technical support is one of the roughest jobs in the computer industry, and spending all day listening to someone else's problems can make you feel like Oprah herself. To ease the situation, a certain BIOS manufacturer (BM) has

come up with a way to make the information as difficult as possible to obtain. First, you make the number a US 0800 call which cannot be dialled from outside the US, then you install voicemail with two different voices giving circular references to one another.

But nothing can beat that human touch on the front line:

PCW: "Hello, I'm calling from *Personal Computer World* magazine in England."

BM: "Yes, do you have the 36-digit number from your machine."

PCW: "Yes, it's ....."

BM: "Oh, that's not one of our motherboards."

PCW: "But it's your BIOS."

BM: "Yes, but it was sold by our Singapore office."

PCW: "Okay, can you give me a phone number for your Singapore office?"

BM: "Yes, but it wouldn't do you any good."

PCW: "Why not?"

BM: "No-one there speaks English."

PCW: "I think you'll find that everyone in Singapore speaks English, it's the first language."

BM: (valiantly) "Erm, well, they will have sold it to a factory in Taiwan, and those factories close down every year." etc...

*We know we shouldn't mock our overseas brethren for their funny names and words. After all, generations of French schoolkids have fallen about laughing at the sight of English shops emblazoned with the word SALE (French for "dirty"), but then, kids have no tact. The restraint of newsreaders who kept a straight face during the rule of Japan's former supremo, Mr Takashita, was little short of the heroic. Still, we couldn't help noticing the name of this firm exhibiting at Cebit, which sells systems for computerising road-freight departments or companies. Perhaps someone should whisper in the MD's ear before it moves into the British market*

*Hot on the heels of the unmissable Tom O'Connor's Funny Side of Golf is CD Visions' latest smash, Female Vampire (aka the Bare Breasted Countess). PCW received no less than four copies of this saucy Video-CD, dubbed into English, which tells the story of a young countess who felines her male lovers to death. Strangely, there's now a sudden interest in reviewing MPEG decoders...*



### Sorry, our mistakes

● Thanks to a freak accident involving an MPEG card and a sausage sandwich, PCW has managed to lose the address of Orchid SoundWave 32 long term test author, Chris Preston. Chris, please get in touch with Ben Tisdall ASAP.

● In last month's First Impressions (page 336), Ben Tisdall was disappointed with Gateway's bundling of Works For Windows with its excellent new Liberty subnotebook. It appears Gateway has taken this on board as the finished product now ships with the much more appropriate Office Professional.

● In last month's issue we printed the wrong phone number for Child's Play. The number you want is 01889 564601.

# WANKO





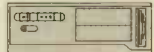
# The **genie**® **PCI** LOCAL BUS Range

**LEADING THE RACE FOR PERFORMANCE AND NEXT GENERATION TECHNOLOGY**

## YOUR CHOICE OF CASE STYLE

### GENIE PCI PROFESSIONAL

Dimensions (W x H x D) mm: 380 x 150 x 415



Two free 5.25" drive bays.

### GENIE PCI MEDIUM TOWER

Dimensions (W x H x D) mm: 170 x 380 x 420



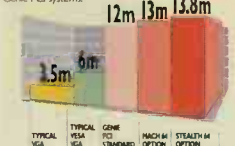
Three free 5.25" drive bays and two free (one internal) 3.5" drive bays.

## MICROSOFT® ERGONOMIC MOUSE

Supplied as standard with the Genie® PCI Range.

## GENIE PCI PERFORMANCE

VGA Performance in New Winmarks 95  
Figures based on Pentium based Genie PCI systems.



GENIE PCI OPTIONS

The Genie® PCI is the flagship of the Viglen range of personal computers, providing the highest performance systems which are in the forefront of leading edge technology. The Genie® PCI was one of the very first systems to incorporate the new PCI local bus architecture with all its performance

advantages as well as the easy to configure plug and play software—thus eliminating the guesswork of yesterday's technology. PCI local bus has now become the industry standard for PCs. The Genie® PCI has carried on incorporating the advances of new technology and currently provides one of

the fastest PCs yet, available with incredibly fast PCI graphics cards, enhanced IDE hard disks and the highest specification 15" Monitor. If performance is your requirement, then the Genie® PCI is the choice for you.

## LOOK AT THIS SPECIFICATION

- Choice of processor, memory and hard disk capacity.
- 3 ISA, 2 PCI, 1 PCI/ISA shared slots.
- Enhanced IDE support.
- 256K secondary WRITEBACK cache.
- One 1.44MB floppy drive.
- 2 serial, 1 parallel printer port (EPP).
- Choice of case styles, either Professional or Medium Tower.
- 486 based systems upgradeable to Intel Overdrive™ processors including those based on Pentium™ Technology and the DX4 100MHz.
- High performance PCI bus Windows accelerated Super VGA card with 1MB RAM. Option for even faster Super VGA cards.
- Viglen ENVY 15P Super VGA 15" FST colour monitor.
- 102 key compact ergonomical keyboard.
- Microsoft mouse with Microsoft Mouse Manager software utilities.
- MS DOS® 6.22, Windows™ 3.11 and Works for Windows™ ready-to-run.
- User friendly manuals.
- 12 months parts and labour warranty with option for low cost parts and labour maintenance for up to 5 years.
- FREE lifetime hotline technical support.
- Option for competitive application bundles.

## THE PRICE YOU PAY

### THE GENIE PCI 486 RANGE

| COLOUR SUPER VGA | PCI 4DX266   | PCI 4DX4100   |
|------------------|--------------|---------------|
| HARD DISK        | 486DX2 66MHz | 486DX4 100MHz |
| 420MB IDE 8MB    | £1229        | £1309         |
| 540MB IDE 16MB   | £1479        | £1559         |
| 730MB IDE 16MB   | £1519        | £1599         |
| 1GB IDE 16MB     | £1609        | £1689         |
| 1GB SCSI 2 16MB  | £1779        | £1859         |

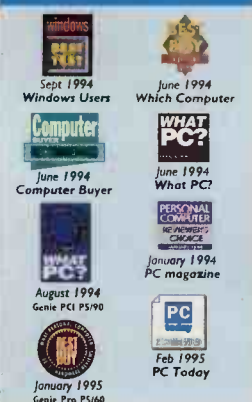
### THE GENIE PCI PENTIUM RANGE

| PCI P5/75     | PCI P5/90     | PCI P5/100     |
|---------------|---------------|----------------|
| Pentium 75MHz | Pentium 90MHz | Pentium 100MHz |
| £1359         | £1559         | £1659          |
| £1599         | £1799         | £1909          |
| £1649         | £1849         | £1959          |
| £1739         | £1939         | £2039          |
| £1909         | £2109         | £2209          |

The prices above are for complete Genie PCI Professional and Medium Tower systems ready to run with MS-DOS 6.22 and Windows 3.11. To order please quote the relevant model along with the Hard Disk and RAM capacity required and PLEASE DO NOT forget to specify the case style required.

ALL PRICES EXCLUDE VAT AT 17.5%

## PRAISE INDEED!



## CHOOSE YOUR OPTIONS

The following are only some of the options available. For a full list of other items look at the 'Options page' or for a free copy of the Direct Guide please call our Sales Department.

- ZSM12NBD 12 Months On-Site Maintenance £39
- PDDXPAT4 High Performance ATI Mach 64 SVGA card with 2MB of VRAM and 64bit graphics engine instead of standard card. £135
- PDDXPST4 Ultra High Performance Stealth 64 SVGA card with 2MB of VRAM and 64bit graphics engine instead of standard card. £145
- VTC17PXL 17" Colour Monitor instead of 15" as supplied £320



TAKE ADVANTAGE OF THE SOFTWARE BONUS WITH EACH VIGLEN PC

SEE 'OPTIONS' PAGE FOR DETAILS.

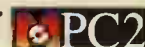
15" MONITOR SUPPLIED AS STANDARD

SAVE £60 VEGA NON-INTERLACED 75Hz AT 1024 X 768

A 14" colour Super VGA monitor can be provided instead of the 15" standard for £60 less.

## MULTIMEDIA OPTION

Why not add Multimedia to the system of your choice? See 'Viglen Options' page for details.



pentium PROCESSOR

Intel Verified: for the Pentium™ Overdrive™ Processor

**RING 0181 758 7000**  **Viglen** **FAX 0181 758 7080**

Viglen Limited, Viglen House, Alpertown Lane, Alpertown, Middlesex HA0 1DX.



## Take advantage of the Software Bonus



### Get the WORKS with Viglen!

In addition to MS-DOS® 6.22 and Windows 3.11, all Viglen systems are now supplied with Microsoft® Works for Windows™, an easy to use integrated package comprising of a word processor, spreadsheet, database and electronic communication software; the ideal tool to run a small business. **Works for Windows™** manuals and disks are not included but these can be provided at small additional cost.

Please quote the following:

Order code **WAPCMD10** Works 3.0 for Windows Manual and disks **£9.99**

## ...and Software Bonus Upgrades...

The additional software bonus obtained from Viglen gives you a choice of upgrading to further powerful applications from Microsoft at very competitive bonus upgrade prices. These bonus upgrade prices are only available when ordered with a Viglen PC at the time of purchase. The following applications are available. Please add the relevant order code when ordering:



### Microsoft® Office 4.2

This is the latest version of the most popular and powerful integrated software package from Microsoft featuring the technology of Intellisense. The package includes Word for Windows™ 6, Excel 5 and Powerpoint 4 as well as a licence to use MS Mail. Supplied pre-installed with full manuals and disks. Order code **WAPMMX30 Bonus Upgrade Price £169**



### Microsoft® Office Professional 4.3

This is the same as Microsoft® Office 4.2 with the addition of the latest version of Access 2.0 - the powerful yet simple to use Windows based database. Supplied pre-installed with full manuals and disks. Order code **WAPMMX50 Bonus Upgrade Price £249**



### Viglen Consumer Bundle

Microsoft® Publisher 2.0, the easy to use desk top publishing package, plus Microsoft® Money 3.0 for money management made simple. Both these packages are fully pre-installed and supplied with full manuals and disks. Order code **WAPMMX60 £49**

Software may be supplied in Viglen OEM packaging

**ALL PRICES EXCLUDE VAT AT 17.5%**

## Upgrade Your Monitor

The Viglen desktop and tower systems are supplied with either a 14" or 15" colour monitor as standard. Please check the specification of the system to determine the standard monitor size. To enhance your viewing even further, a larger monitor option can be chosen as follows:

### 15" MONITOR UPGRADE OPTION

**VTC15PXL Contender Range Monitor upgrade from 14" to the ENVY15P, a fully-featured 15" SVGA colour monitor with VESA power saving functions. £90.00**

### 17" MONITOR UPGRADE OPTION

**VTC17PLL Contender Range Monitor upgrade from 14" to the ENVY17P, a fully-featured 17" SVGA colour monitor with VESA power saving functions. £330.00**

**VTC17PXL Contender Range Monitor upgrade from 14" to the ENVY17PE, a very high specification 17" SVGA colour monitor. This is an enhanced version of the ENVY 17P providing a higher resolution including 1280 x 1024 Non Interlaced at 78Hz. £410.00**

**VTC17PLL Genie and EX Range Monitor upgrade from 15" to the ENVY17P, a fully-featured 17" SVGA colour monitor with VESA power saving functions. £240.00**

**VTC17PXL Genie and EX Range Monitor upgrade from 14" to the ENVY17PE a very high specification 17" SVGA colour monitor. This is an enhanced version of the ENVY 17P providing a higher resolution including 1280 x 1024 Non Interlaced at 78Hz. £320.00**

## Experience the excitement of CD ROM and Multimedia

Why not add a CD ROM drive or indeed a full multimedia option including CD ROM drive and a 16 bit sound card to the system of your choice? You can choose from one of the following two new exciting and cost effective options. Remember, all options are factory fitted, installed, fully tested and ready to run.



### CD ROM Drive Option

**ONLY £99 + VAT**

Take advantage of the ability to use all the new software that is being supplied on CD ROM format and add an IDE CD ROM double speed photo CD compatible drive to your system for **only £99.00 + VAT**. Please quote order code **DCDDNP01** when ordering.

### Multimedia Option PC2

For a complete multimedia solution including both CD ROM drive and a sound card, choose our new **Multimedia Option 1** to be fitted in your system. This provides a genuine 16 bit Soundblaster card along with an IDE CD ROM drive as well as all the accessories to get you started. The Multimedia Option 1 can be added to your system for **only £195.00 + VAT**.

Please quote order code **UCDM01NI** when ordering.

### The multimedia option 1 Includes:

- Genuine Soundblaster 16 bit card.
- Soundblaster Creative Ensemble software and more.
- Double Speed Photo CD compatible IDE CD ROM Drive.
- Pair of Amplified Speakers
- Microphone.
- 3CD ROM Titles from Microsoft: Musical Instruments, Encarta '95 and Golf.
- Microsoft Works and Money.



**Multimedia option 1 fitted to a Genie Professional system.**

**ONLY £195 + VAT**

## Support for you

Unlike many PC manufacturers, Viglen puts equal emphasis on its after-sales service - that means not only a comprehensive standard warranty on every product but a choice of service packages that offer total cover for up to five years.



All Viglen PCs are supplied with a 12 months collect and return warranty (UK only). This covers your Viglen PC and any other options that are factory fitted, covering parts and labour. In addition to these standard warranty terms, which provide a better and quicker response than some of our competitors, Viglen offer a choice of additional low-cost on-site options to meet specific user requirements - See to the right.

**Do not forget, when you compare our services with our competitors, please read their small print. With Viglen, you have a choice and your choice is clear.**

### ADDITIONAL ON-SITE OPTIONS

For complete peace of mind choose one of the additional low-cost on-site warranty options.



This option converts the standard Viglen warranty into a next business day on-site response for 12 months covering parts and labour. Order code **ZSM12NBD £39** - for all desktop and Tower models. Order code **ZSM12DSS £149** - for Dossier portable range.



This option converts the standard Viglen warranty into a 4 hour on-site response for 12 months covering parts and labour. Please call for details of this individually tailored package.

**FOR A FULL RANGE OF THE UPGRADES AND OPTIONS AVAILABLE WITH YOUR VIGLEN PC, CALL NOW FOR YOUR FREE COPY OF THE VIGLEN DIRECT GUIDE.**

**RING 0181 758 7000**



**Viglen**  
YOU'LL NEVER LOOK BACK

**FAX 0181 758 7080**

Viglen Limited, Viglen House, Alpertons Lane, Alpertons, Middlesex HA0 1DX.

**697**  
PERSONAL COMPUTER WORLD  
MAY 1995





# The DOSSIER<sup>®</sup> Range

**ADVANCED SOUND** THE NOTEBOOK PC THAT OFFERS POWER, FLEXIBILITY AND MULTIMEDIA SOUND

## YOUR CHOICE OF CASE STYLE

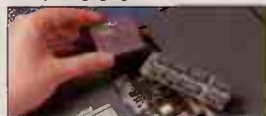
### NOTEBOOK

Dimensions:  
(W x H x D) mm  
279 x 43 x 216 closed

Weight with battery: 2.7kg  
(6lb) for mono, 2.95kg (6.5lb)  
for colour Dossier 486 and  
3.09kg (6.8lb) for  
colour Dossier P5



LCD Status icon display panel including battery charge gauge.



Easy to upgrade CPU. Up to DX4 100MHz for Dossier 486 and up to Pentium 90MHz for Dossier P5. Also easy to upgrade RAM and hard disk.



Two separate PCMCIA type 2 slots or one type 3 allowing a host of PCMCIA cards (for modems, networks, storage and more) to be used.



Docking station accessory option. Just slip the Dossier ADVANCED Sound into the docking station to transform it into an instant desktop system.

## PRaise INDEED!



August 1994  
Dossier 486 AM  
**WORTH A LOOK**  
What to buy for Business  
February 1995  
Dossier P5



March 1995  
Dossier 486 Highly Recommended  
**GOOD VALUE**  
What to buy for Business  
February 1995  
Dossier 486

The Viglen Dossier<sup>®</sup> ADVANCED Sound is a range of portable notebook sized PCs that offer flexibility and power for people on the move. This range provides many advanced features that rival even the most powerful desktops. It is available in two main processor ranges, the Dossier<sup>®</sup> 486 processors ranging from 486SX 25MHz to 486DX4 at 100MHz, and the Dossier<sup>®</sup> P5

for Pentium processors from 75MHz to most powerful 90MHz. There is a choice of exceptional colour screen types for each range (Dual Scan or a high contrast fast TFT) and a Mono screen for 486 models. In addition to the features shown on the left, the Dossier<sup>®</sup> ADVANCED Sound includes sound hardware compatible with SoundBlaster and Microsoft Sound system

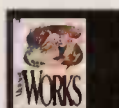
allowing you to manipulate sound and music to enhance your productivity. Plus there is a whole range of accessories and upgrades including a docking station, PCMCIA cards, external speakers, car battery adaptor and many more, making the Dossier<sup>®</sup> ADVANCED Sound a notebook that needs to be seen and heard to be believed!



**EASY 2 OWN**

Easy to Own payment scheme From £46.08 per mth over 36 mths **19.9% APR** 10% deposit. See "Order page" for typical example.

Organizer Working Together Supplied as standard



TAKE ADVANTAGE OF THE SOFTWARE BONUS WITH EACH VIGLEN PC SEE 'OPTIONS' PAGE FOR DETAILS.

## LOOK AT THIS SPECIFICATION

### Dossier<sup>®</sup> 486:

- Intel SL enhanced 486SX 25MHz, 486DX2 50MHz, 486DX2 66MHz, 486DX4 75MHz and 486DX4 100MHz.
- 4MB RAM, upgradeable to 20MB.
- 170MB HD upgradeable to 720MB.
- Choice of Mono (9.5" STN), Colour DSTN (10.3" Dual Scan STN), or Colour TFT (9.5" TFT) screen.
- Battery Life: 5.5 hours on 486SX mono with full power management, 4 hours without, 4 hours on 486SX colour with full power management, 2 hours without. (high processor speeds will reduce battery life).

### Dossier<sup>®</sup> P5:

- Intel Pentium processor 75MHz and 90MHz.
- 8MB RAM, upgradeable to 40MB.
- 540MB PCI IDE HD, upgradeable to 720MB.
- Choice of Colour DSTN (10.3" Dual Scan STN), or Colour TFT (10.4" TFT).

- Battery Life: 2 hours on Pentium 75MHz colour with full power management, 1.5 hours without. (high processor speeds will reduce battery life).

### For both the Dossier<sup>®</sup> 486 & P5:

- 3.3 volt technology.
- Comprehensive power management with doze, sleep, suspend and resume.
- 8K internal cache. (486) and 16K (Pentium processor).
- 3.5", internal 1.44MB floppy drive.
- Local bus accelerated Super VGA Graphics with 1MB Video DRAM (PCI local bus graphics for Dossier<sup>®</sup> P5).
- 1 Serial, 1 Parallel, 1 PS/2 port, 2 PCMCIA type 2 or 1 type 3, 1 expansion socket for docking station.
- Infra red wireless link control Windows (Dossier<sup>®</sup> P5 only).
- 85/86 key keyboard.
- Ergonomic large tracker ball with arm rest to reduce wrist fatigue.
- NiMH battery.
- Audio with built in speaker and microphone and socket for external speakers and line in (16-bit stereo for Dossier<sup>®</sup> P5).
- LCD Status icon display.
- MS-DOS<sup>®</sup> 6.22, Windows 3.11, Works for Windows<sup>™</sup> ready to run and Lotus Organizer.
- User-friendly manuals
- 12 Months **parts and labour** collect and return warranty. Low cost on-site option up to 5 years.
- Free lifetime hotline technical support
- Option for competitive application software bundles.

## THE PRICE YOU PAY

| DOSSIER 486   |                        |           |     | DOSSIER P5                           |         |           |     |
|---|------------------------|-----------|-----|--------------------------------------|---------|-----------|-----|
| INTEL SL ENHANCED 486SX 25MHz   |                        |           |     | INTEL PENTIUM PROCESSOR 75MHz        |         |           |     |
| MODEL NAME  | DISPLAY                | HARD DISK | RAM | MODEL NAME                           | DISPLAY | HARD DISK | RAM |
| DOSSIER 486 SM  | MONO 9.5" LCD          | 170MB     | 4MB | DOSSIER P5 SD COLOUR 10.3" DUAL SCAN | 540MB   | 8MB       |     |
|   |                        |           |     |                                      |         |           |     |
| DOSSIER 486 SD  | COLOUR 10.3" DUAL SCAN | 170MB     | 4MB | DOSSIER P5 ST COLOUR 10.4" TFT       | 540MB   | 8MB       |     |
|   |                        |           |     |                                      |         |           |     |
| DOSSIER 486 ST  | COLOUR 9.5" TFT        | 170MB     | 4MB |                                      |         |           |     |
|   |                        |           |     |                                      |         |           |     |
| <b>DOSSIER 486 UPGRADES</b>   |                        |           |     | <b>DOSSIER P5 UPGRADES</b>           |         |           |     |
| CPU UPGRADE TO:   |                        |           |     | CPU UPGRADE TO:                      |         |           |     |
| 486DX2 50MHz £39, 486DX2 66MHz £89, 486DX4 75MHz £119, 486DX4 100MHz £149 |                        |           |     | Pentium Processor 90MHz £220         |         |           |     |
| HARD DISK UPGRADE TO:   |                        |           |     | HARD DISK UPGRADE TO:                |         |           |     |
| 260MB £49, 340MB £85, 540MB £219, 720MB £399                              |                        |           |     | 720MB £129                           |         |           |     |
| MEMORY UPGRADE TO:  |                        |           |     | MEMORY UPGRADE TO:                   |         |           |     |
| 8MB £149, 12MB £299, 20MB £639  |                        |           |     | 16MB £309, 24MB £679, 40MB £1359     |         |           |     |

ALL PRICES EXCLUDE VAT AT 17.5%



March 1995  
Dossier 486 Highly Recommended  
**Personal Computer World**  
the Viglen is a 'no nonsense' machine at a competitive price.  
March 1995  
Dossier 486  
March 1995  
Dossier 486  
March 1995  
Dossier 486

## CHOOSE YOUR OPTIONS

The following are only some of the options available. For a full list of other items look at the 'Options page' or for a free copy of the Direct Guide please call our sales department.

N4ADXD0 Docking station for Dossier 486 £309  
N4XDELUX Deluxe padded carrying case £49

N4XPSXDC Universal car battery adaptor £69  
NXXMA013 130MB PCMCIA Hard Drive £219  
NXXMA017 170MB PCMCIA Hard Drive £269  
CMDPOT2F 9600/2400 PCMCIA Fax/Modem £135  
CMDPOT3F 14400/14400 PCMCIA Fax/Modem £185  
PAMSP501 External amplified speakers £23



**RING 0181 758 7000** **Viglen** **FAX 0181 758 7080**





# **NEW** **The Contender<sup>®</sup> PCI Range**

**A VALUE RANGE OF PCs WITH LEADING EDGE PCI TECHNOLOGY**

## YOUR CHOICE OF CASE STYLE

### CONTENDER PCI PROFESSIONAL

Dimensions (W x H x D) mm:  
380 x 150 x 415

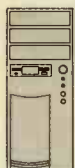


Two free 5.25" drive bays.

### CONTENDER PCI MEDIUM TOWER

Dimensions (W x H x D) mm:  
170 x 380 x 420

Three free 5.25" drive bays and two free (one internal) 3.5" drive bays.



## MICROSOFT<sup>®</sup> ERGONOMIC MOUSE



Supplied as standard with the Contender<sup>®</sup> PCI Range.

Now all Contenders comply with EPA energy saving specification.



The Contender<sup>®</sup> PCI is a new value range of personal computers providing the performance edge and future proofing of PCI local bus technology as well as the ease of use of Plug and Play software. It is one of the lowest cost PC investments you can make without compromising

quality, reliability or support. And you won't be disappointed when it comes to performance either.

The Contender<sup>®</sup> PCI is available in a choice of two case styles (see inset box) and in a 486 and Pentium processor range. It offers amazing value for money

and is ideal for most office applications such as word processing, accounts and spreadsheets.

With a host of options including multimedia, the Contender<sup>®</sup> PCI makes the perfect PC for everyday use.

## LOOK AT THIS SPECIFICATION

- Choice of processor, memory and enhanced IDE drives.
- 8K (16K for Pentium Processor) Cache RAM built into CPU plus 128K (256K for Pentium Processor) second level external cache.
- 3 ISA, 2 PCI and 1 PCI/ISA shared bus slots.
- One 3.5" floppy drive.
- 2 Serial, 1 Parallel printer port (EPP), 1 PS/2 mouse port.
- Choice of case styles either Professional for desktop use or Medium Tower for desktop or floor standing use.
- CPU Upgradeable: 486 models upgradeable to 486DX4 100MHz and Intel Overdrive processors based on Pentium<sup>™</sup> technology.
- High Performance PCI bus Windows accelerated Super VGA card with 1MB video DRAM. Option for even faster performance.
- Viglen ENVY 14P, 14" Super VGA Colour Monitor.
- 102 Key compact ergonomic keyboard.
- Genuine Microsoft Mouse.
- MS-DOS<sup>®</sup> 6.22 and Windows<sup>™</sup> 3.11 and Works for Windows<sup>™</sup> pre-installed and ready-to-run.
- User friendly manuals.
- 12 months parts and labour collect and return warranty. Low cost on-site option up to 5 years available.
- Free lifetime hotline technical support.
- Options for competitive application software bundles.



Includes software for easy configuration of add-in cards

## THE PRICE YOU PAY

### THE CONTENDER PCI 486 RANGE

| COLOUR SUPER VGA |      | PCI 4DX250   | PCI 4DX266   | PCI 4DX475   |
|------------------|------|--------------|--------------|--------------|
| HARD DISK        | RAM  | 486DX2 50MHz | 486DX2 66MHz | 486DX4 75MHz |
| 270MB            | 4MB  | £889         | £939         | £959         |
| 420MB            | 8MB  | £1019        | £1059        | £1089        |
| 540MB            | 16MB | £1269        | £1309        | £1339        |
| 730MB            | 16MB | £1309        | £1359        | £1379        |

### THE CONTENDER PCI PENTIUM RANGE

| PCI P560      | PCI P575      | PCI P590      |
|---------------|---------------|---------------|
| PENTIUM 60MHz | PENTIUM 75MHz | PENTIUM 90MHz |
| -             | -             | -             |
| <b>£1209</b>  | <b>£1259</b>  | <b>£1459</b>  |
| <b>£1459</b>  | <b>£1499</b>  | <b>£1699</b>  |
| <b>£1499</b>  | <b>£1549</b>  | <b>£1749</b>  |

The prices above are for complete Contender PCI Medium Tower and Professional systems ready to run with MS-DOS 6.22 and Windows 3.11. To order please quote the relevant model along with the hard disk and RAM capacity required and PLEASE DO NOT FORGET to specify the case style required.

ALL PRICES EXCLUDE VAT AT 17.5%

## CHOOSE YOUR OPTIONS

The following are only some of the options available. For a full list of other items look at the 'Options page' or for a free copy of the Direct Guide please call our Sales Department.

ZSM12NBD 12 Months On-Site Maintenance **£39**

VTC15PXL 15" Colour monitor instead of 14" as supplied **£90**

VTC17PXL 17" Colour Monitor instead of 14" as supplied **£410**



TAKE ADVANTAGE OF THE SOFTWARE BONUS WITH EACH VIGLEN PC

SEE 'OPTIONS' PAGE FOR DETAILS.

## MULTIMEDIA OPTION

Why not add Multimedia to the system of your choice?

See 'Viglen Options' page for details.



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PERSONAL COMPUTER WORLD  
MAY 1998





# SPECIAL CONFIGURATIONS!

## DIRECT...TO YOU

Viglen produce a wide range of PCs and options to give you the ultimate choice. We have also designed a number of special configuration packages offering an abundance of software applications to suit specific needs and budgets.

For education, entertainment, personal accounting, business management or high performance computing, we have the package to fit your needs. We also have the latest multimedia systems combining sound, text, animation and video into one easy to use system. There is a Viglen Special Configuration that's just right for you.

All Viglen PCs are supplied as a complete package and ready to use. However, the software installed will vary according to the special software configuration package you choose. Here, we've briefly outlined each software package to help you decide which special configuration is right for you.



**MICROSOFT® WORKS**  
Five essential tools for easier everyday

computing. Word processing, spreadsheet, database, graphics and communications tools.



**MICROSOFT® PUBLISHER**  
This desktop publishing software is the

key to producing professional quality output, layouts and clip art.



**MICROSOFT® MONEY**  
A complete set of financial management

and planning tools to manage your investments and expenditure.

## Multimedia Titles



**MUSICAL INSTRUMENTS** Features 200 instruments—many rare and exotic—from around the world. Hear and play 1,500 authentic sound samples of instruments and jazz, classical and rock ensembles.



**ENCARTA® '95** The complete interactive Multimedia Encyclopedia. This best selling and award winning title condenses 28 volumes into one CD. Maps, charts, sound and pictures bring information to life!



**GOLF** Rise to the true-to-life challenge of Microsoft® Golf. Realistic graphics and sounds combine with true golf ball flight paths, accurate swing control and a choice of courses.



## Software Bonus Upgrades

All the special configurations shown can be further upgraded to include one of the following professional integrated software applications from Microsoft at a very special bonus upgrade price. Please allow extra delivery time for these options.



### Microsoft® Office 4.2

A popular and powerful integrated software package from Microsoft featuring the technology of Intellisense and including Word for Windows™ 6, Excel 5 and Powerpoint 4 as well as a licence to use MS Mail. Supplied pre-installed with full manuals and disks.

Order code **WAPMMX30** Bonus Upgrade Price **£169**



### Microsoft® Office Professional 4.3

This is the same as Microsoft® Office 4.2 with the addition of the latest version of Access 2.0 the powerful yet simple to use Windows based database. Supplied pre-installed with full manuals and disks.

Order code **WAPMMX50** Bonus Upgrade Price **£249**

Please note some software may be supplied in Viglen OEM packaging

## HOME Business MULTIMEDIA PC

**£999**

+ Delivery and VAT =  
£1191.45

**486DX2**

- 4MB RAM
- 270MB HD
- 14" SVGA Colour Monitor
- Multimedia CD ROM

- Viglen Contender® Professional PC with 486DX2 50MHz Processor
- Fast Local Bus Accelerated Graphics 1MB Video DRAM
- 2 serial, 1 parallel, 1 PS/2 port, 1 games port
- 3.5" Floppy Drive
- Ergonomic Compact Keyboard
- Genuine Microsoft® Ergonomic Mouse
- MS-DOS® 6.22 and Windows™ 3.11 Ready To Run
- Plus
- Genuine 16 Bit Soundblaster Sound Card
- Double Speed Photo CD Compatible CD ROM Drive
- Stereo Amplified Speakers
- Microphone
- Microsoft® Works for Windows™
- Microsoft® Publisher
- Microsoft® Money
- Multimedia CD Titles from Microsoft®: Encarta® '95, Musical Instruments and Golf

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**SOUND BLASTER**

**LOCAL BUS**

## PROfessional Business MULTIMEDIA PC

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**PCI LOCAL BUS**

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- 8MB RAM
- 420MB HD
- 14" SVGA Colour Monitor
- Multimedia CD ROM

- Viglen Contender® PCI Professional PC with 486DX2 66MHz Processor
- Fast 64 bit PCI Local Bus Accelerated Graphics 1MB Video DRAM
- 2 serial, 1 parallel, 1 PS/2 port, 1 games port
- 3.5" Floppy Drive
- Ergonomic Compact Keyboard
- Genuine Microsoft® Ergonomic Mouse
- MS-DOS® 6.22 and Windows™ 3.11 Ready To Run
- Plus
- Genuine 16 Bit Soundblaster Sound Card
- Double Speed Photo CD Compatible CD ROM Drive
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Includes software for easy configuration of add-in cards

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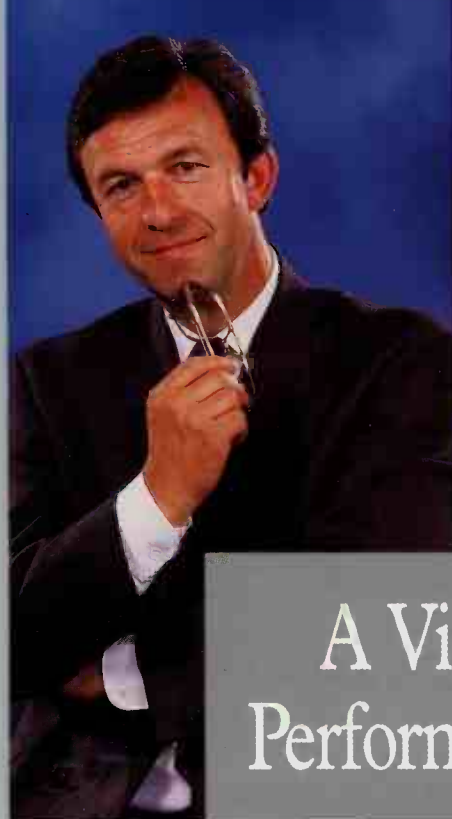
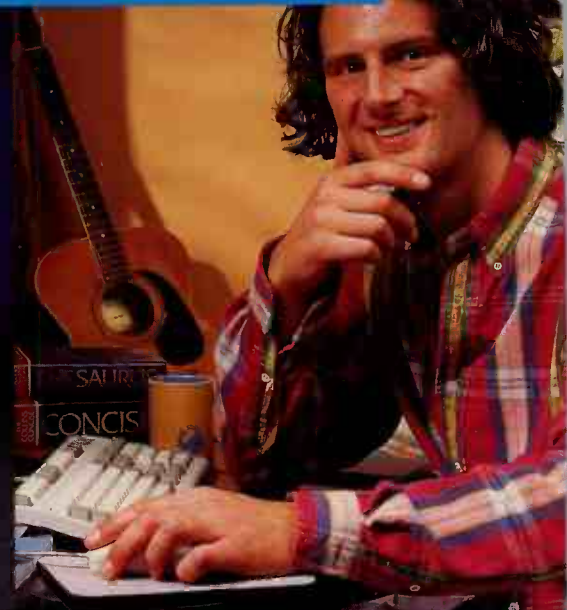




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**PCI LOCAL BUS** **Pentium PROCESSOR** **75 MHz**

- 8MB RAM
- 540MB HD
- 15" SVGA Colour Monitor
- Fast 64 bit PCI Graphics Card
- Multimedia CD ROM

Viglen Genie® PCI Professional with Pentium 75MHz Processor

- 2 serial, 1 parallel, 1 games port
- 3.5" Floppy Drive
- Ergonomic Compact Keyboard
- Plug and Play Software for easy upgrading
- Genuine Microsoft® Ergonomic Mouse
- MS-DOS® 6.22 and Windows™ 3.11 Ready To Run

**Plus**

- Genuine 16 Bit Soundblaster Sound Card
- Double Speed Photo CD Compatible CD ROM Drive
- Stereo Amplified Speakers
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- Microsoft® Money
- Multimedia CD Titles from Microsoft®: Encarta® '95, Musical Instruments and Golf

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Medium Tower case option available, please allow extra delivery time.

**PLUG and PLAY** Includes software for easy configuration of add-in cards

### POWER Business MULTIMEDIA PC

**£1699**  
+ Delivery and VAT = £2013.95

**Sound BLASTER**

**PCI LOCAL BUS** **Pentium PROCESSOR** **90 MHz**

- 8MB RAM
- 540MB HD
- 15" SVGA Colour Monitor
- Fast 64 bit PCI Graphics Card
- Multimedia CD ROM

Viglen Genie® PCI Medium Tower with Pentium 90MHz Processor

- 2 serial, 1 parallel, 1 games port
- 3.5" Floppy Drive
- Ergonomic Compact Keyboard
- Plug and Play Software for easy upgrading
- Genuine Microsoft® Ergonomic Mouse
- MS-DOS® 6.22 and Windows™ 3.11 Ready To Run

**Plus**

- Genuine 16 Bit Soundblaster Sound Card
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**PLUG and PLAY** Includes software for easy configuration of add-in cards

### HOME Business PORTABLE PC

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**486DX2** **50 MHz**

- 4MB RAM
- 260MB HD
- 9.5" Mono LCD Screen
- 9600/14400 Fax/Modem

Viglen Dossier® ADVANCED Sound notebook sized (6lb) portable PC with 486DX2 50MHz Processor

- 1 serial, 1 parallel, 1 PS/2 port
- 2 PCMCIA ports, socket for docking station option
- CPU upgradeable
- 3.5" Floppy Drive
- Built in speaker and microphone for multimedia sound
- Built in large tracker ball
- MS-DOS® 6.22, Windows™ 3.11 Ready To Run and Lotus Organizer

**Plus**

- Microsoft® Works for Windows™
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**only £50.36 per month APR 19.5%**  
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**LOCAL BUS**

### PROFESSIONAL Business PORTABLE PC

**£1799**  
+ Delivery and VAT = £2131.45

**486DX2** **66 MHz**

- 8MB RAM
- 340MB HD
- 10.3" Dual Scan Colour LCD Screen
- 14400/14400 Fax/Modem

Viglen Dossier® ADVANCED Sound notebook sized (6.5lb) portable PC with 486DX2 66MHz Processor

- 1 serial, 1 parallel, 1 PS/2 port
- 2 PCMCIA ports, socket for docking station option
- CPU Upgradeable
- 3.5" Floppy Drive
- Built in speaker and microphone for multimedia sound
- Built in large tracker ball
- MS-DOS® 6.22, Windows™ 3.11 Ready To Run and Lotus Organizer

**Plus**

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If you require any help or advice on choosing a system to suit your requirements please call our Sales Department. To help us identify your requirements please state the product code, description and price of items required.

When you have decided on your system please fax or phone your orders. You will need to add £15.00 per system for courier delivery, add 17.5% VAT on top. Collections may be made by prior arrangement. Please allow 7-10 working days for delivery, except for Viglen special configuration models which we will do our utmost to deliver within 3 working days from clearance of payment.

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Credit card, Switch, Connect or American Express card holders can order by telephone. Just call us and ask for our Sales Department.



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**Easy 24 MONTH** monthly payment scheme is available to private purchasers subject to status. Typical example of payment calculation of PC costing £799 ex VAT: £799 + £15 (delivery) + 17.5% VAT = £956.45 total cash price. 10% deposit of £95.65 required followed by 36 monthly payments of £31.27 (APR=19.9%). For finance over £1499 ex VAT, APR drops to 14.9%. Additional payment protection insurance is available. Viglen Ltd is a licensed credit broker.

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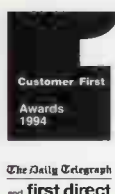
### Showroom open

Monday-Friday 9.00 - 5.30  
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Public and Bank Holidays, Also Saturdays preceding a Bank Holiday Monday

Viglen systems are exclusively distributed in Eire by Lendac Data Systems, Unit 31, IDA Enterprise Centre, Pearse St., Dublin 2, Ireland. Tel No: Dublin 710796 Fax No: Dublin 710135. Prices in Eire differ from those quoted in this advertisement.



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Our customer first philosophy ensures every aspect of our business is geared to customer satisfaction. In recognition of this the 1993/4 Computer Weekly Datapro Survey consistently rated Viglen first for reliability, sales support and overall satisfaction. Viglen were also highly commended in The Daily Telegraph and First Direct Customer First Awards 1994.



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**Each Viglen system has a 12 months parts and labour warranty**, including collection from and return to you at our expense (mainland UK only). For complete peace of mind there is also a further choice of low-cost on-site service packages for up to 5 years. With mission critical systems, such as a file servers, our 4 hour response premium on-site service is available.

Remember to carefully read the small print of our competitors when comparing services. At Viglen we believe in giving you a choice and making that choice crystal clear.



**Our pedigree is impeccable, with over 19 years experience** in providing quality manufacture and support services.



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