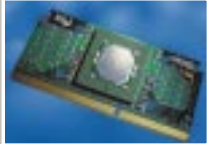


RIVAL 3 processors



Intel Celeron

This is the old cacheless version. The new 300a and 333 devices have 128Kb cache and are much faster.

Intel 01793 403000



AMD K6-2 3D

Available in 333MHz and 300MHz versions. AMD has slashed prices to undercut Intel.

AMD 01483 740440



Cyrix MII

Also has 333MHz and 300MHz versions. Looks a more solid bet since Cyrix was bought by NatSemi.

Cyrix 01793 417777

Master plan

Imagine a program that will run through a PC hard disk, making all code Y2K compliant without changing program sizes, checksums, or functions.

That's what Millennium Master, from MFX, is said to do. We won't believe it until we've tried it. If you can't wait for our verdict, it is being sold by POW.

Call 01202 716726

PROCESSORS

Intel races downmarket

Intel has launched two fast **Celeron processors and a price war** in a bid to

regain the initiative in the growing market for low-cost PCs. The first 266MHz and 300MHz Celerons had no cache, and our group test [page 174], which pits them against AMD's K6-2 3D, confirms criticism of their speed. The new Celeron 300a and 333 (clock rates match their names) boast 128Kb of L2 cache. Comparison with the K6-2 is hard because they use a different socket; but early tests in our VNU Labs indicate that they are faster.

Intel slashed the bulk price of the old Celeron 300 by 30 percent to \$112 and the 266 by 19 percent to \$80. New Celeron prices were not available as we went to press but there were rumours of more price cuts to come. In response, AMD cut the K6-2/333 price massively from \$369 to \$237, and the K6-2/300 from \$281 to \$157 (the 266 will be dropped). A spokeswoman said: "These



prices could fall further if Intel makes further cuts." Meanwhile, Cyrix launched a 333MHz version of its MII and almost immediately cut the bulk price from \$180 to \$162; the price of an MII 300 fell from \$135 to \$82. Perhaps more worrying for Intel are signs that buyers no longer distrust non-Intel PC chips. A US survey found that more than one in two US firms would consider buying PCs using other makes. IBM lent credibility to AMD

by using the K6-2 in all but the most expensive of its Aptiva E home range (above). Brand manager Alec Welland said K6-2 prices enabled IBM to offer a full-spec internet-ready multimedia PC for just £799.

Intel also risks missing the emerging appliance market. Stan Shih, head of Taiwanese giant Acer, was in London to evangelise his XC reference designs based on PC chips. The latest news was that he was signing up Cyrix to power them.

FUTURES

IBM chip breakthrough

IBM claims to have had a breakthrough in **insulating individual transistors** within processors, making them far more efficient. It will lead to chips that need only a third of the power for a given clock speed — or run up to 20 percent faster for a given power drain, IBM says. The silicon-on-insulator (SOI) process needs only minimal changes to plants and gives the ability to make processors clocking 1GHz. SOI will be used in IBM's existing products, including the

PowerPC chip. Earlier this year, IBM claimed a similar efficiency gain with a breakthrough in the use of low-resistance copper "interconnect". But an internal Intel briefing found SOI wanting, reports Mike Magee of VNU Newswire. It says SOI can actually cut performance on fast chips, depending on the circuit configuration. The document also says power reduction is negligible at high speeds.

More information can be found at www.chips.ibm.com



Overdrive kills the Pro

The Pentium Pro has been dropped, but a new PII Overdrive provides users with an upgrade path. The \$599 chip fits into the Pro's Socket 8, pushing 150MHz and 180MHz Pro PCs to 300MHz, and 166MHz and 200MHz to 333MHz. It may prove faster than a standard PII as its internal cache runs twice as fast.

short stories



PARANOIA FUEL

See anything strange about these cables? That nodule in the keyboard lead stores the first 1000 keys you press... enough to capture your password. Vendor Microspy calls it a "surveillance tool for authorised professionals". It can be fitted in seconds and taken off as quickly, for its secrets to be accessed. For the best of reasons, naturally.

Microspy 01908 607007
www.microspy.com

PCs AT TESCO'S

Tesco is selling discounted Fujitsu PCs at New Malden, Surrey, in a pilot scheme which will be extended to other stores if necessary.

See also *Tesco Net*, p.36.



KIND SCREENS
Iiyama says its six latest Vision Master displays ease

eye strain by offering the best available refresh rates.

Iiyama 01438 314417

INTERNET

New free access deal

Another company is offering free internet access. Unlike the ad-funded service at www.x-stream.com, Telinco's new **Home Connect** is financed by phone calls. Telinco, which gets up to 3p a minute for every call passed on to BT, offers national calls for up to 35 percent cheaper. If you pay a £20 start-up fee and spend more than £35 per quarter on Telinco calls, you get your net time for the cost of the

local call, plus 5Mb of web space, a freephone number which works like a chargecard, and a number which lets people ring you wherever you are. ISP Demon, owned by Scottish Telecom, is adding services to attract users (see p36) but is not likely to go free. Marketing manager Ade Brownlow said: "Our users are more concerned with quality of service."

Home Connect 0800 542 4343

Psion unveils fast Series 3

Psion has unveiled a new fast version of its Series 3 palmtop. The 3mx uses a 28MHz version of the NEC-made 80c86 chip used on the original — a **fourfold boost in speed**. The new model includes the same suite of organiser programs and the body has been restyled. It will cost £269, competitive with the glut of rivals hitting the market but not undercutting them. Many, like the PalmPilot, bundle PC connectivity, but

Psion's PsiWin 2.0 suite costs £49 extra with cable. Spokesman Steve Pang said this was so that existing users do not have to buy the program again if they upgrade. "Many people who buy a Psion don't own a PC," he said.

Psion 0990 143050
www.psion.com



SERVICES

New PCW help hotline

PCW is launching a **help hotline** that you can ring if you have any problems with a PC or peripheral. If one of our 300 lines is engaged you can leave your number with our answering service and we will call you back. Sadly we cannot provide this service for free. Calls will be charged at £1.50 per minute. For complex problems you can ring back later for a solution.

Or you can buy a £12.95 voucher, which lets you talk to the hotline until your problem is solved. The helpline conforms to standards set by ICSTIS, the regulatory body for telephone services. If you don't think we have solved your problem satisfactorily, we will refund the cost of your call.

The number to call is:

0906 466 4465



PCs across world lose sleep as IT goes ET mad

IT luminaries are pouring millions into a **search for alien life** — and you, too, are being asked to help. Gordon Moore, William Hewlett, Paul Allen and Sandy Lerner (founders respectively of Intel, HP, Microsoft and Cisco) have each put money into the Search for Extra-Terrestrial Intelligence Institute (SETI). And late this year you will be able to download a program

for intelligence-testing data collected by the world's biggest radio telescope at Aricibo, Puerto Rico. The idea is that PCs can crunch the data as a background task or while users are asleep. Users download about a quarter megabyte of data, which takes about two days to process. Any suspicious signs are reported back for further investigation.

More than 115,000 people have already signed up for the SETI@home scheme based at the University of California. SETI www.seti.org hopes to complete five detailed analyses of the entire sky within two years.

VNU NEWSWIRE

"Extra-terrestrial searching? Sounds like a desperate way to try to increase your market"



AND THE REST...

■ Jini is not the first scheme to ease the use of devices on networks, although few can offer its global sweep. Other plans include:

NEST

Novell Embedded Systems Technology was meant to facilitate device interaction but did not gain widespread acceptance. Now Novell is routing a front-end called Net Top which, it says, could be used either with Jini or its own Groupwise product



JETSEND

This free Hewlett-Packard technology enables a camera, say, to talk directly to a network printer with no need for special drivers. Canon, Lexmark and Xerox are said to have adopted the technology but have yet to incorporate it in products.



BLUETOOTH

This new initiative, backed by the likes of Nokia, IBM and Ericsson, provides for devices of all types to interact via spread-spectrum radio (see PCW, August). It could complement Jini, rather than rival it.

MCOM

This covers a number of Microsoft projects, codenamed Millennium, aimed at simplifying networking.

briefing

Jini spells easy netting

Plug a radio into the mains, plug a device into a net. It'll be much the same thing using new Java trickery. Or so Sun says. Clive Akass reports.

A Java-based technology called Jini will make signing on to a network as easy as plugging in a phone, according to developer Sun. The idea is to allow you plug into an office, home or hotel network anywhere in the world to take advantage of local services such as printing, fax, or internet access. Sun calls this “**spontaneous networking**”, doing away with the need for driver installations and tricky configuration. It relies on a core of just 45Kb of code which can be embedded into devices such as electronic cameras or organisers.

Jini uses the concept of a network “citizen” which can be a person, a device, an application or a data set. Each citizen, or group of citizens, is represented on the network by a Java Virtual Machine, which can run on any platform. Jini creates a community, or federation, of these virtual machines but is not a network operating system as such: it sits above other operating

systems. A citizen joins the community by announcing itself and advertising its services (*see below*). A digital camera, for instance, might say: “I am a camera. Anyone want to use me?” A printer on the same network might take note and offer to print any pictures. An archive disk might offer to store them. Sun envisages a Jini-enabled hotel guest, for instance, being able to link up to head office from his room and to use the hotel's printers or fax machines.

Sun says Jini source code will be available to developers under a “Jini public licence”, on similar terms to those of Netscape's Mozilla and Linux. It believes this open-source model encourages development by providing anyone with the means to push the technology forward (*see page 42*).

Details at java.sun.com/jini/index.html

HOW IT WORKS

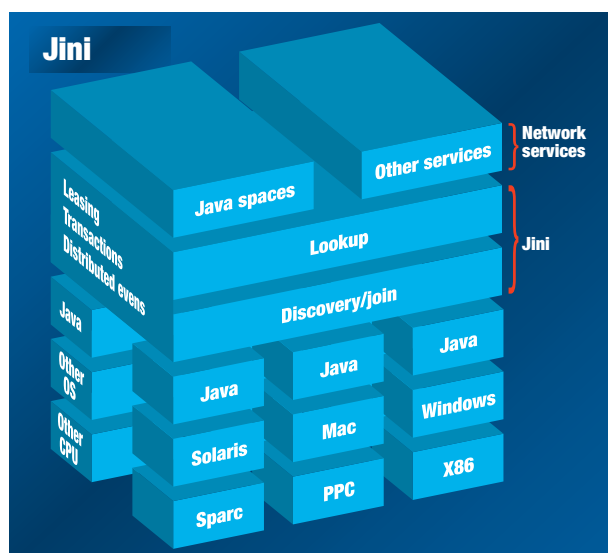
How Jini looks out of the bottle

A Jini community can include machines using any processor or operating system, as long as they can run a Java Virtual Machine. Features of the Jini layer are:

■ A newcomer to the community sends a 512-byte **Discovery** packet. This is picked up by the **Lookup** module, which registers available services and acts as a gateway to them. This module passes the newcomer a communication interface. The visitor has now joined the community.

■ Services are **leased** for a certain time. Leases have to be renegotiated when they expire, ensuring that devices are removed from **Lookup** when unplugged.

■ Jini provides an



application programming interface to ensure that distributed events occur in the order intended; it also provides a manager for **distributed transactions**.

■ Network services include **JavaSpaces**, which act as a kind of global postbox so that service providers and recipients do not need to keep track of each other.

short stories

FLAT RATE

This Viewsonic VP150 shows how flat-screen prices are creeping down to mass-market level — fuelling the dispute about interface standards (see right). The 15in screen, offering up to 1024 x 768 resolution non-interlaced, costs around £775 (ex VAT). But prices are expected to fall.

MMD(distributor)01734 313232



DESIGNER LABELS

The £22 (inc VAT) Press-It is designed to apply labels neatly to CDs and comes with software for designing them.

Rocky Mountain Traders
0171 631 0707



CHEAP LIBRETTO

Morgan is selling an early model of Toshiba's Libretto mini-notebook, using a 75MHz AMD 586 processor, for just £399 (ex VAT).

0121 456 5565

TELETEXT ON TAP

Pace is selling an £89 (inc VAT) PC TV card with access to up to 125 channels, either standard, cable or satellite. It also streams Teletext.

Pace 0990 561001

DISPLAYS

Socket FUD holds back flat screens

Confusion over a digital interface could slow the spread of **flat-panel colour displays** to the desktop.

Traditional CRT monitors take an analogue signal, so a standard for a digital link has been slow to emerge.

LCD screens are digital, and to drive one from a normal graphics port involves a lossy, expensive twin conversion to analogue and back again. Last year the video standards body VESA introduced the Plug and Display (P&D) standard. It used a 30-pin connector with both analogue and digital display paths, and 1394 and USB serial links.

The aim was to have a single standard connector for all display types. But a group of vendors, led by Compaq, said the P&P standard was too expensive when only a digital link was needed. They formed the Digital Flat Panel working group which came up with a simpler 20-pin link which has

been used in two Compaq Presarios. To complicate matters further, the Japanese Display Interface Standards for Monitors group has

come up with yet more

proposals, including Sony's 14-pin Gigabit Video Interface. DFP and

P&D links both use

Panellink transmitter and receiver chips (pictured) from Silicon Image. Rae Cho, its business development manager, said the rival links were electrically identical and the cheaper DFP version made more sense for big-selling PCs like the Presario. "It is a case of market segmentation," he said.

But Bob Raikes, managing editor of *Display Monitor*, said the issue was generating a lot of FUD (Fear, Uncertainty and Doubt). "My advice is to treat everything as proprietary at the moment."

Silicon Image www.siimage.com
DFP group www.dfp-group.org
VESA www.vesa.org



COMMS

DAB audio browser for motorists

An audio browser for motorists will be born of a marriage of **Digital Audio Broadcasting (DAB)** and GSM phone technology, predicts a UK company. DAB offers CD-quality sound and is set to be Britain's main radio system within a decade. But the car was the driving force, so to speak, behind its development because DAB promises interference-free

reception and an end to the need to re-tune your radio. DAB (governed by the World DAB



Forum) uses forward error correction like DVB (see p40) and can carry web data. DAB radios can have mini web screens but there is no return channel and in-car displays are unsafe. But Nick Johnson, of TTP Communications, says a combined GSM/DAB device can be built for only marginally more than the cost of a cellphone. And GSM can give DAB a return channel. TTP envisages a Tell Me More button which you can press when you want more information about something you hear on the radio; perhaps a topic under discussion or a weather or traffic report. "You could also have forward and backward buttons, just like a browser," Johnson said.

TTP 01763 266266

www.ttpcom.com

World DAB Forum www.worlddab.org

INPUT

Take a letter, Miss Recorder

A UK firm is selling a device which it claims lets any continuous speech recognition product

take input from a tape, creating a **dictation system**. Dragon Naturally Speaking (not the cheaper personal edition) includes a facility for transcribing from



a Sony Minidisc. But you can't use just any recorder because there are problems with noise and voltage levels, said Stephen Savage, sales director of Parish Maze. He claims his Mobi-Dict interface, costing about £50, will take input from a "wide variety" of recorders, though slightly different versions may be needed for different brands. Parish Maze has

promised to send us one to try out, so watch this space.

Endeavour Technologies is selling Lernout and Hauspie's entry-level Speakwrite for £19.99, including mike and word processor. A £39.99 professional edition lets you dictate into any Windows product.

Endeavour 01932 827324
Parish Maze 0141 221 6230

NetWare 5.0 embraces the net to ward off NT

Novell will launch **NetWare 5.0** on 20th September, bringing its flagship operating system into the age of the intranet and internet. The release comes at a time when NetWare is losing market share to Windows NT – though it still runs two in



three local nets, and sales are rising in a swelling market. "We sold more seats last year than ever before," claims market development manager, Derek Venter. The big change in 5.0 is a move to IP from Novell's IPX, so NetWare will be running internet protocol native for the first time. IntranetWare, the IP-enabled Netware 4.0, was an interim solution. Netware 5.0 also packs a Java Virtual Machine, the Console One Java GUI, and a five-user licence of the Oracle 8 database. Novell has been careful to make the upgrade path as

easy as possible. NetWare 5.0 needs 500Mb of disk space fully loaded, so many will need a new or upgraded server to run it. However, Venter says upgrades from NetWare 4.0 can be done in stages. A new server can provide access to NetWare 5.0 services while tried and tested NetWare 4.0 remain in service. Novell chief Eric Schmidt (left) says NetWare is years ahead of rivals with its directory services and will benefit from the delayed launch of NT 5.0. A beta of NetWare 5.0 can be downloaded from www.novell.com.

If anyone can, Kahn can

If I didn't know better, I'd say Philippe Kahn was a cat. The founder of Borland and other ventures certainly has more lives than one. For months he was touting "wearable computers" like his REX PC card; recently he began talking up what he calls the personal network. Now Motorola has bought his Starfish company for about \$200 million because it wants TrueSync, a piece of software that lets you synchronise data from any device (such as Motorola's pagers and smart cellphones). Borland made Kahn's name as a visionary. Now it looks as if he has made his mark again.

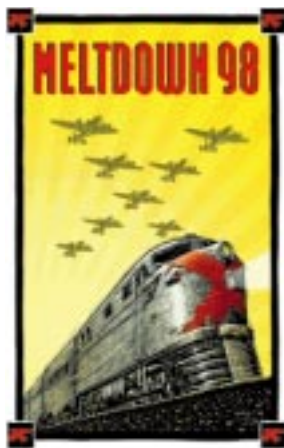
Intel, Sony, IBM, Compaq, Tut, Lucent, Intelogis and at least 10 other companies are all touting home-networking products. Lucent's Home Star Network is wired into a house as it is built. CAT 5 wiring goes to every room and a "control box" can serve as a broadband link. It costs about \$1500 per house. Intelogis piggybacks its signal on the mains. The snag is that rooms have to be wired on a single loop. The Home RF Networking Group is working on a 2.4GHz spread-spectrum wireless system that will deliver up to 1.3Mbit/sec. VESA espouses the use of 1394. But front-runner for a standard is a proposal by the Home Phoneline Networking Alliance <www.homepna.org>, founded by 3COM, AMD, AT&T Wireless, Compaq, Epigram, H-P, IBM, Intel, Lucent, Rockwell Semiconductor and Tut Systems. This standard should be finalised this month and aims to deliver an initial 1Mbit/sec over a standard phone line, and up to 10Mbit/sec within 18 months.



Tim Bajarín
letter from **Silicon Valley**

GRAPHICS Direct X marks spot – with sound

Microsoft released **DirectX 6**, the latest version of its multimedia application programming interface (API), at its **Meltdown 98 conference** of games and hardware developers. It also previewed some DirectX 7 features. Microsoft claims DirectX 6 can improve performance by up to 40 percent in supported applications. It offers features like multitexturing and texture compression which, with appropriate hardware, can boost both speed and image quality. A new component is DirectMusic, which allows music to change with context – perhaps the actions of a game player. The developer can include multiple soundtracks and audio effects to reflect a particular reaction or situation.



Direct3D has been revamped following criticism of its lack of features and programming difficulty, and DirectSound has been revamped to handle the predicted PC surround-sound revolution, with support for various audio codecs. At press time,

Microsoft had not announced the full list of features to be included in the forthcoming DirectX 7. But it has said that it will support the next generation of graphics accelerators with dedicated geometry processors. Also, Team Direct is expected to refine Direct3D so that it provides better performance using fewer processor cycles.

AJITH RAM

SECONDHAND MARKET

Only £199 gets you a PC

ICL is to sell reconditioned ex-company PCs from as little £199, but analysts believe the idea is dead in the water. The **Star (Second Time Around) service** aims to emulate Vauxhall's Network Q scheme for selling secondhand cars, by selling through 300 reputable dealers across Britain. The revamped machines will be from brand leaders including Compaq, IBM and Hewlett-Packard. Each will be wiped of data, refurbished, resprayed, relicensed and fitted with a new keyboard and mouse. All systems sold will come with a ninety-day warranty and dealers will provide telephone support and an extended warranty if required. Prices, which are to be set by ICL, will start at around £199 for a 486 system, and rise to £350 for a Pentium. The company says that they will be ideal for students,

homes and small businesses which do not need a fast system. Of 1.8 million PCs sold last year, more than half were replacements. "There may be a niche market for small, cost-conscious businesses which do not need all the bells and whistles," said Pete Day, an analyst for market research company Inteco. "But consumers in the UK can be talked up, they buy high-spec machines, and they want the latest and the biggest. It's a nice idea, but no way."

ICL is confident that the idea will catch on, thanks to European Union legislation expected next year, which will tighten the rules on the disposal of old computer equipment.

JAN HOWELLS,
VNU NEWSWIRE

LEFT FIELD

Left-handers of the world, unite! Saitek will release the first fully programmable PC joystick for left- or right-handed players this autumn. Not only is the Cyborg 3D Stick completely customisable, but it also features Ratio Digital technology, which uses an internal processor to speed gameplay. (Price to be announced.)

--
Saitek 01454
855 050
www.saitek.com



RECYCLE YOUR PC

The registered charity ComputerAid! is offering a free PC recycling scheme, allowing schools and charities in the

developing world to benefit from UK businesses' unwanted leftovers.

For more information, call
0171 281 0091



Let's get serious, gamers

Dan Technology is hoping for a cut of the entertainment market with what it modestly calls "the world's most serious games PC". The Dan GameStation includes a DVD drive, 8Mb AGP video card with built-in TV, 3D video accelerator, a 17in monitor and two Microsoft Sidewinder joypads, among other goodies. Prices start from £1,648 (ex VAT).

Dan 0181 830 1100 www.dan.co.uk



Year 2000 round-up

The two warring millennium bug action groups have kissed and made up. Robin Guernier (pictured, right), director of the private-sector initiative Taskforce 2000, said that his group and the government-led Action 2000 had reached an agreement to "mutually support each other". The feud started after Taskforce 2000 had its funding removed by the DTI when Action 2000 was formed last autumn.



Insurance companies are being criticised for trying to duck out of paying for millennium-bug damage. Many say they've been forced to introduce millennium exclusions into their policies. Critics say they'll still end up having to pay out, but only after a lengthy and expensive legal fight.

Financial house Merrill Lynch is playing down Y2K fears, saying it will have little impact on the economy. It says there may be "glitches" but companies will cope. Analysts said the company might just be trying to minimise the fears of its shareholders.

Action 2000 is asking British businesses to promise to take positive, rather than legal, action over Y2K. Both Sainsbury's and Unilever have signed Pledge 2000, a six-point document that includes promises to share information, help other firms in their supply chains, and avoid resorting to legal action wherever possible.

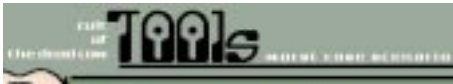
Quarterdeck is being sued by one of its US customers over an alleged millennium bug. Against Gravity Apparel Inc. says the company continued to sell Procomm Plus 4.0 even though it knew it would be useless after 1999. It requires a \$30 upgrade to be bug-free.

0845 601 2000, www.bug2000.co.uk

SECURITY ALERT

Email rogue code scare

Two new security scares erupted last month. Researchers in Finland claimed to have found a way to run **rogue code from passive email**, and a group called the **Cult of the Dead Cow (CDC)** claimed 35,000 copies of a Trojan called Back Orifice (BO) had been downloaded from its site in less than ten days. A Trojan is rogue code disguised as a kind of utility, or packaged as an ActiveX control. Once activated it sets up a control gateway, giving a remote hacker the run of your machine across the internet (or a local net). It will run under Windows 95 or 98. BO author Sir Systic said it was written to expose security holes in Microsoft software.



Microsoft has never denied that its operating systems are open to this type of attack. Users are advised to accept executables only from known sources, or those offering an "authenticode" certificate. More insidious is the email threat. Plain email cannot carry viruses; attachments can, but they have to be activated by the user. But the Finns say that an attachment with an unusually long name can crash some email programs and rogue code within the name will be executed without user intervention.

Vulnerable programs are said to include Outlook 98 (but not 97), Outlook Express (PC, Solaris and Mac versions) and Netscape Communicator 4.x. Netscape and Microsoft are likely to have posted patches on their sites by the time you read this.

(ADDITIONAL REPORTING BY DOMINIQUE DECKMYN)

RELIEF

Reader Brendan Griffin, of Eire, was tricked into launching the Back Orifice Trojan but wrote to tell us of a simple defence, based on the fact that it dumps its own configuration utility. Call up a DOS window and type boconfig boserve.exe. This lets you, among other options, choose a password, "then run the Trojan again and this will wipe the previous version." The hacker will thus not know the password to get into your PC. Trend Micro has posted a free fix at www.antivirus.com.

New transducers revolutionise speakers

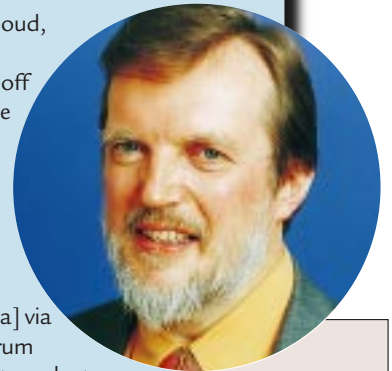
Imagine being able to carry around a sound system with the capability of 3cu.ft loudspeakers, **listening to great sounds anywhere**. That's what Tony Hooley (pictured, right) claims to have developed, and his company, 1...Limited, is talking to the world's leading hi-fi companies about potential partnerships. Hooley says his are the first true digital speakers (USB speakers from Philips and Microsoft pack a digital-to-analogue converter). "All these hi-fi companies have agreed that what we have developed is the way to build digital loudspeakers," says Hooley, who has harnessed leading researchers in Birmingham, Paris, Australia and, shortly, San Francisco.

Hooley, an astronomer and Cambridge physicist, claims to have built the first solid-state hard-disk cacheing system, originally for Apple IIs, in pre-PC days. He said his breakthrough came around four years ago. For 20 years, anyone designing digital systems had thought in terms of binary data. But an on-off digital stream can also represent unary, or one-based data, which has the

characteristics of a tally system; a 1 counts as a 1 irrespective of position. "Our ideas began crystalising around unary concepts...with which we can do additional, fancy things with how speakers produce sound." The new speakers use an array of 256 piezo-electric transducers, each 10mm in diameter and 20mm deep; each can move up to 20mm.

"The key inventive step was realising that binary didn't work and how to make transducers suitable for unary," said Hooley, who spent the whole of 1997 with his team working on an innovative transducer format. "What we do know is that no-one else has worked on this. Everyone who has been to our labs, except one major Japanese company developing a different technology, said they knew digital speakers would come but they [didn't know] how to go about it." Hooley says that the transducers reduce distortion by a factor of ten compared with conventional speakers, use a fraction of their electrical power for a given sound level, and need to be a fraction the size.

"We can run loud, high-quality hi-fi speakers off a rechargeable battery. We foresee loudspeakers which are completely portable... [receiving data] via spread-spectrum wireless." First products could be on the market in two years. Hooley predicts that his transducers will be produced in their billions, with power amplifiers, digital-to-analogue converters and loudspeaker cables made redundant. They will also mean an end to the use of a PC's sound system, which cannot do justice to the machine's ability to process high-quality 20-bit digital audio. "As the sound info from a PC is...digital, this can be applied directly to the digital speaker which uses our transducers, with no amplifier needed."



TONY HOOLEY CLAIMS TO HAVE DEVELOPED A WAY TO BUILD DIGITAL SPEAKERS

Caroline Swift



continues her reports from **Silicon Fen**

short stories



► **MIND GAMES**
Uri Geller is giving the public the chance to see into his living room — without the benefit of psychic powers. For the next year, you can visit the UriCam <www.urigeller.com/uricam/index.html> at 11am and 11pm on the eleventh day of each month to try to guess what the “wizard of weird” is visualising. Prizes, including a Citroën Saxo, are on offer for the closest guess.

► **BRAND-NAME BRIGANDS BELAYED**
A new court ruling will stop internet “pirates” from registering famous brand names such as Harrods or Virgin, and then selling them back for a profit. In July, the UK Court of Appeal ruled that the company One in a Million, which had registered names such as burgerking.co.uk, was infringing on company trademark. The ruling brings UK law into line with US regulations.



► **EXCITING FREE EMAIL**
Excite is offering a free email service for UK users as part of its plan to increase localised content. By registering at www.excite.co.uk, you can get your own personalised email address. The service is similar to Hotmail and will soon be extended to Germany and France, and Excite plans to personalise the service further in coming months.

► **SELLING POINT**
If you're hoping to sell your car or pick up a used PC, try www.preloved.com. Preloved is a free, 500-category, UK advertising service.

net news

ISPs face competition from high street names

A battle is shaping up between the high street and traditional internet service providers (ISPs) to win new customers. In July, Tesco announced that it would be setting up as an ISP under the banner of TescoNet. Meanwhile, the Nationwide Building Society was expected to start offering a service later this summer. Demon Internet immediately announced that it would be offering extra value for its customers, in an attempt to ward off the new competition. But Tesco is confident that customers will be drawn to its brand name and is promising “low cost, ease of use, and excellent customer support”.

The service, which will be provided through British Telecom (BT) for £8.99 per month, includes unlimited internet access, five email addresses, 5Mb of web space and local call charging. Customers who sign up for a year will be charged for only 11 months. Tesco's Information Technology director, Ian O'Reilly, said: “Our experience has shown



that the new wave of internet users are looking for a name they can trust. Tesco aims to offer an innovative service that will enable the novice, as well as the experienced web user, to make the very most of the internet.”

Shortly after Tesco's announcement, Demon Internet revealed a package of extra goodies for its customers, including extra web space, a fax-to-email service, dedicated games servers and a three-month trial with BT's content site, Line One. It insists, however, that it is not unduly worried about high street competition, calling them “virtual ISPs”.

Ade Brownlow, product marketing manager at Demon, says that although users might be drawn to a high street brand name at first, they're likely to switch to a traditional ISP when they get to know what they want from the internet.

The Nationwide is confident that the move from high street to cyberspace is the right one to take. “We have eight million customers. We already provide internet banking and have a web site. If you've got a large customer base it makes logical sense,” said a spokesman.

SUSAN PEDERSON
(ADDITIONAL REPORTING BY
VNU NEWSWIRE)

AOL 4.0 'Number one' ISP goes for gold

In the same week that it claimed it had become the number one ISP in the UK, AOL released the gold version of AOL 4.0. Praised for its more intuitive interface, AOL 4.0 features a spelling and grammar checker as well as a new address book, allowing users to check mailboxes or

multiple accounts without logging off. AOL said that it had 450,000 members at the end of July.

More information:
AOL 0800 279
1234, www.aol.co.uk



net news

RealNetworks kicks the WMP

Like Sun and Netscape before it, RealNetworks is accusing Microsoft of **abusing its position**. But many industry commentators, vendors and testers think there's no case to answer.

The row between Real Networks and Microsoft over their video streaming software could have far-reaching implications for how multimedia files are handled by competitive products. In July, RealNetworks slammed Microsoft, claiming that the new Windows Media Player (WMP) "breaks" its own Real Player software. It then called for a formal code of practice to be adopted that would give consumers a consistent experience for deciding which software should handle particular file formats.

RealNetworks CEO, Rob Glaser, told a Senate Judiciary Committee hearing on competition in the IT industry that when the WMP is installed on a PC running its new beta Real System G2, the Microsoft product registers itself as the default player for Real System content. It is unable to play any content created for Real System 5.0 or G2, however. RealNetworks also claims that the WMP replaces Real Player 4.0 as the default player for Real System content when it is installed on the same PC. Glaser's accusations were



◀ **REALNETWORKS'**
ROB GLASER
WANTS A NEW
APPROACH TO
HANDLING FILE
FORMATS

supported by a number of vendors, as well as the Software Publishers' Association (SPA), all of whom condemned the practice of automatically resetting user-preferences for a certain file type when a competitive application is installed. Digital Bitcasting claimed that it had suffered the same problems with its own media player, saying that "Microsoft's products go in and run roughshod over the data types".

Ken Walsh, president of the SPA, said that applications should never interfere with competing vendors' software and should always ask the

user for permission to change the default file viewing values. In a surprising twist, however, many vendors, journalists

and testing labs rallied to support Microsoft, saying that the problem lies not with the WMP but with a bug in Real Networks' software. Larry Seltzer, ZD Virtual Labs' technical director, said: "Microsoft is right. It's completely unjustifiable for RealNetworks to say that Microsoft has changed something that broke the G2 player."

The Association for Competitive Technology also called for Glaser to withdraw his testimony, saying: "While it made for dramatic testimony, it raises the possibility that RealNetworks sought to exploit the Senate hearings to advance its own competitive interests at the expense of the truth." But RealNetworks is standing behind its statements, saying that claims of a bug are "technically inaccurate".

SUSAN PEDERSON

PRINCIPLES

'Ask, Tell and Help' — a new initiative

RealNetworks has announced a set of principles to help customers decide what kind of software should handle their files. It is called "Ask, Tell & Help: Fair Practices and Conventions for handling file formats in the Era of the Internet".

Over 20 internet companies have pledged their support including Netscape, Novell, Sun Microsystems and Digital Bitcasting. If the principles

are adopted as standard, software will have to ask for permission to become the default viewer for certain file types. It will also have to point out any limitations that it might have in reading certain file types and inform the user of competitive products that might do a better job. The companies behind the initiative say that it will safeguard consumer choice and ensure the best end-user experience possible by

► **Is REALNETWORKS** **GETTING A RAW DEAL** **FROM MICROSOFT?**

providing a "vendor-neutral environment". Critics think that it will only serve to confuse inexperienced customers by providing too many options and needlessly complicating installation procedures. But it remains



to be seen whether the pressure for fair competition will ultimately outweigh the need for user-friendly computing.

net analysis special

Broadcast news

Are portal services the answer to satellite companies' dreams of big bucks? Clive Akass locks on to Convergence1, from Eutelsat, which promises **twice the speed of ISDN at half the cost.**

News that US Web TV makers have cut production for lack of demand is the latest sign of a curious phoney war.

Everyone is preparing to battle for the billions to be made when computing, the net and broadcasting hit full synergy; but nobody knows quite how and when it will happen. Meanwhile, they plot, and fly kites (like Web TV based on outdated analogue technology) and pour billions into hunches — like the portal companies (see *opposite*). And the digital TV consortia focus on flogging set-top boxes for rival services, ignoring the millions of PCs that have the flexibility to explore their full potential.

manufacturer is free to supply. I tried it out using an Adaptec 1030 DVB card which is equipped only for data transfer: any MPEG processing has to be done in software. A new version this autumn will link to an STB board to enable hardware decompression for TV reception.

Convergence1 was still slightly buggy. The satellite connection reverted without warning to a land link and download speeds varied wildly, partly depending on how many pilot users shared a 2Mbit downlink. The bottleneck at these speeds is as likely to be at source as in the delivery. So there is an advantage in mirroring popular web sites on Easynet servers which can deliver direct to the satellite. Easynet is

currently offering more of a portal model, with a variety of fast on-site services (see screenshot, left) though many of these are not yet fully operational. One that does work is that of Software Warehouse, which sells software online. In three test downloads spread over an evening, I averaged 113Kbit/sec, 178Kbit/sec and 248Kbit/sec. Easynet's

technical guru, Justin Fielder, reckons upwards of 400Kbit/sec is possible in the early hours. Even at these speeds, downloads can take several minutes, during which time you are paying to keep a land line open. Yet DVB uses forward error

correction which provides enough redundancy in the data stream to give a good chance of reconstructing lost bits and pieces (a 2Mbit channel, though, means 2Mbit of your data — the redundancy is not

counted). So why not simply call for a file to be dumped by satellite, and forget about the continual handshaking over the phone? This might be possible using a carousel system, broadcasting a sequence of files at regular intervals. Any data missed first time round can thus be picked up during further broadcasts. Fielder doubts, as things are, if this could scale to

many users. Satellites also lend themselves to IP Multicasting, which sends a single file or data stream to many addresses with minimum use of bandwidth. Of course, the satellite's most efficient mode is that of one-to-anyone broadcasting. Clearly, satellites and always-on xDSL land links will cause a big shift in the way the internet is used: from pull to push, from unicast to multicast and broadcast. Newspapers, music, videos and software packages may be ordered by day and dumped at night on sleeping channels. These systems are still embryonic but the hardware is already in place. Fielder says: "Software companies have yet to catch up with satellite technology"; so, perhaps, have content providers and users.

If Convergence1 does go commercial, Fielder reckons charges will be based on "twice the speed of ISDN at half the cost". By which he means each user will be able to reckon on at least 128Kbit/sec bandwidth, twice that of a single ISDN channel. And there will be no per-megabyte charge, as with DirecPC. But satellite companies are not the only players in the field. A new company called Goldmine is set to announce plans for a broadband portal service using cable.

● See the PCW web site for a hyperlinked version of this article, with pointers to further information (and another card supplier).

Easynet: 0171 681 4444
www.convergence1.com

SKY HIGH:
EUTELSAT'S
CONTROL CENTRE ▼



An exception is Eutelsat, part-owned by BT and already broadcasting digital TV on many of its 350 channels. These are mainly foreign and minority channels but include many free ones in English. Eutelsat has hosted the DirecPC turbo-internet service for more than a year (see

Satellites and xDSL land links will cause a big shift in the way the net is used

Newsprint, May '97) and is now piloting, with internet service provider Easynet, a similar service called Convergence1.

As with DirecPC this requires a standard net connection for the up link, with a satellite and dish aerial providing a fast down channel. It differs in being restricted to an Easynet uplink, and in using open technology which any

net analysis special

Band of gold

One part of the high-tech sector is thriving while the rest suffers. And as bandwidth gets bigger, portal companies are especially hot property. Tim Bajarin eyes up who's netting the big money.

With the rash of layoffs hitting Silicon Valley recently, you would have thought that the high-tech sector was on the downslide. In this technology segment at least, there seems to be no relief in sight. However, the internet sector is making up for job losses at equipment makers, with companies like Yahoo!, Lycos, Infoseek, and Software.net taking on staff.

The portal companies are especially hot property. Yahoo! in particular is going through the roof: it may not have earned much, but its valuation is almost \$9bn. Recently, Disney purchased 40 percent of Infoseek, and Excite and Lycos are rumoured to have big-time partners lined up. So, what's driving everybody to invest? The answer lies in your TV set. Big media thinkers believe that these portal sites will become the next broadcasting medium, supplanting TV giants like NBC, CBS and ABC. The reason is that they are laying the groundwork for a two-way interactive approach that today's one-way TV companies cannot supply even if they go digital. Which is why Disney, which owns ABC, has bought into Infoseek. It will use this "net channel" to deliver Disney and ABC content, with interactivity. No-one expects mainstream TV broadcasting to fade away in the near future, but the writing is on the wall. So I consider Yahoo!'s \$9bn valuation to

be low. So does Wall Street, as financial analysts expect portal stocks to rise even higher. Also booming are commerce-related sites such as bookseller Amazon.com, and Barnes and Noble.com. Books are easy to choose online and cost up to 40 percent less than from the local store. Microsoft's top high-tech guru, Nathan Myhrvold, reportedly spends about \$5000 a month at Amazon.com. Companies like Amazon.com and Software.net have

Portal sites will serve as the front door to video, audio, information and commerce

created virtual businesses. They lack brick-and-mortar sites which can cost \$1m just to get started, but they have a sophisticated operation to handle the web site, order entry and order fulfilment. More importantly, their "stock" of one million books does not reside under a single roof. Instead, the books sit at publishers' sites and multiple warehouses, and are sent to

customers using a simple electronic order fulfilment process.

Egghead Software has closed all its retail stores and opted for a similar approach, and music vendors are following suit. They can offer sample sound clips to tempt buyers. In fact, Amazon.com is starting to sell music and could soon offer movies.

We are already seeing the real-estate market move in this direction, as well as consumer electronics stores like Circuit City and The Good Guys, which have used their web presence to extend their local businesses to the entire world. This same model is now starting to be applied to the radio business, and national web-based radio is on the horizon. As bandwidth increases, the delivery of TV and video will also start streaming over the net, reflecting the concept of virtual businesses. It's no wonder, then, that portal sites like

Yahoo! and Infoseek are such hot properties. They will serve as the front door to video, audio, broad and narrow information, and commerce. They are destined to become the broadcasting giants of the next century.



analysis

The young pretender

Linux, the **underdog free operating system**, has been enjoying a recent surge of popularity: even Microsoft seems to be taking it seriously. Susan Pederson wonders whether it can last.

When Danish programmer Linus Torvalds created the first version of the Linux operating system in 1991, he had no idea how much interest it would eventually generate. In fact, he liked to joke that it was the operating system for one person — himself. But it all started to change this summer when several top-tier vendors announced their support for the former “hobbyist clone” of the Unix operating system.

In July, Oracle announced that it would be porting version 8.1 of its database to Linux, while database software company Informix says it will also move its software to the system. Linux has also been demonstrated on a

system running four of Intel's new Xeon

▼ A LINUX DESKTOP DOESN'T LOOK MUCH DIFFERENT TO A WINDOWS ONE



processors, and a version has been promised for Intel's upcoming 64-bit Merced architecture. These announcements have prompted a flood of predictions that Linux is fast becoming a force to be reckoned with.

Like other freeware products, Linux is something of an upstart in an industry that thrives on moneymaking and *de facto* standards. Developed and maintained by a group of unpaid

enthusiast programmers working across the internet and co-ordinated by Torvalds, the Unix kernel is downloadable for free and comes with a General Public Licence. This means that anyone can change the source code as long as they submit alterations back to the group. Netscape recently did the same thing and is now offering the source code to some of its software for free via the internet.

Torvalds says that Linux still needs some work and is not ready to tackle either the low-end novice-user market or the high-end commercial server arena. But this has not stopped NASA

‘...the levels of support given to us by the Linux community are exceptional’

developing a Linux-based massively parallel system. Torvalds also believes that Linux is an important weapon for smaller companies trying to compete against giant corporations like Microsoft. He's even predicted that Linux will become the dominant Unix server operating system within three years. Linux is certainly gaining support from an increasing

number of vendors. It has been reported that Computer Associates, Interbase and Software AG are all working on Linux database ports. Netscape has also promised to port its Directory and Messaging servers to the platform this year, with the rest of its products following in about 18 months' time. And Corel has ported WordPerfect to Linux, too.

Other vendors are even more

vehement in their support of the free source-code model. John Brittain Adams, managing director of Chameleon Computers, says that his company has decided to stop selling all Microsoft products by the end of the year, instead focusing on sales of Netwinder and Cobalt computers. “It's due to the total lack of support that Microsoft has given us,” says Adams. “We've decided that the levels of support given to us by the Linux community are exceptional.” Adams believes that Linux will evolve so quickly that major vendors (including Microsoft) will be powerless to fight it.

“I can confidently predict that within 14 years, open source code software will eliminate the dominant software companies of the moment,” says Adams. He

even goes so far as to say that if Microsoft wants to survive, it will have to start porting to Linux. And Microsoft seems to be taking the challenge seriously: in April, it was accused by Caldera of putting pressure on a PC maker not to license Open Linux.

But Linux faces many challenges. Its critics say that it is not sufficiently user-friendly and claim that technical support is lacking. These pitfalls may make many potential customers think twice before abandoning their NT systems. Analyst IDC estimates that Linux currently has 6.3 percent of the server market, but it's likely that many of the operating systems are being used by internet service providers — very experienced users who are looking for a cheap alternative to Windows NT.

It's possible that the flurry of third-party support this summer was little more than marketing hype. The sudden announcement of major database vendors' support for Linux came at the height of the holiday season, a period when product launches are scarce and the industry needs a talking point to tide it over until the autumn. Despite Linux's obvious merits, the timing is just a little too convenient for comfort.

analysis

Office politics

Tim Nott considers the Office 2000 beta, explaining how Microsoft hopes to use HTML to enhance the **digital nervous system** of large corporations by playing a hand of proprietary aces.

It could only happen in the software industry. Microsoft flew in journalists from around the world to Seattle, and spent two and a half days showing them the next release of Office on the condition that the assembled hacks swore not to tell a soul for four weeks.

There is method in this seeming madness, though. Microsoft wanted to give reviewers a head start without stealing the thunder from the official Beta One release date. By the time you read this, the wraps will be off and 20,000 beta-testers will have their hands on the product. To confuse issues, the beta version is titled Office 9, the Reviewer's Workshop was entitled Office 2000, and it is expected to appear in "early 1999".

There's a lot that's new (and we'll report in a future issue of PCW) but the big question is that of file formats. It

has been reported, a little misleadingly,

that HTML is to become the native language of the Office components. This is not the case. The .DOC, .XLS and .PPT binary file formats remain unchanged and retain their status. The Access binary file format has changed but only to enable Unicode support which provides the vital "two-byte character" support for oriental languages. So, where does this HTML thing come in, and what's it all about? In a nutshell, it's all to do with "leveraging the web paradigm" to enhance the "digital nervous system" of large corporations. To get a perspective on this, it helps to know that 75 percent of Office sales are made to corporates. Now think intranets. The advantage of putting a document on a company web site rather than emailing binary files is self-evident, with simple, speedy distribution and faster feedback.

What's made this difficult in the past is first, the conversion to HTML: previous editions of Office can "Save As..." HTML; but even Microsoft admits this wasn't well implemented. Second, there's the problem of transferring the HTML files to the intranet web site. These factors conspire to limit web publishing to intranets or departmental webmasters, creating a bottleneck that negates the advantages of intranet distribution. The first of the three aces in

the Microsoft hand is "round tripping" between binary and HTML formats. If, say, you save a Word document containing drawing objects to HTML, then these will be converted to GIFs for display in a browser. However, the original drawings will be preserved in the HTML file as XML (Extensible Markup Language) objects, as will other "invisible" attributes such as document properties. Load the HTML file back into Word, and all the original objects and formatting return.

Then comes the integration of web folders, either on a company intranet or the worldwide web, into the file system. The user can load from or save to any web server for which they have permission. As with the HTML "round tripping" the process is transparent to the end-user and as easy as accessing folders on their own hard disk.

So far, so good, and this technology is not proprietary; it will work in conjunction with non-Microsoft browsers. But this is essentially static HTML. The documents don't "do" anything when viewed in a browser, but have to be loaded into the authoring application to be editable.

With Internet Explorer 5, though, Microsoft plays its final, proprietary ace. In-place "Discussions" can be attached to a document so that others can make newsgroup-style threaded comments, either in IE5 or in the originating application.

It gets even more clever with the Office Web components. With these installed on the server, and Office 2000 and IE5 installed on the client, the user can manipulate data in a spreadsheet without leaving the browser. Facilities include online form-filling (e.g. for expenses claims) and detailed manipulation of data held on the server, such as using Excel-style charts or pivot tables.

Seventy-five percent of Office sales are made to corporates

▼ THE SEATTLE NEEDLE... INJECTING NEW INTERACTIVE FEATURES INTO THE BROWSER



net law

EC gives its blessing to domain name reforms

The European Commission has pledged its support for the US government's proposals to reform the internet name and address system. In June, the US Commerce Department suggested that a new international non-profit-making corporation should be set up to manage internet domains.

According to a European Commission statement, "The EU, the US, and the international community agree now that all pending decisions on internet governance should be referred to the new private sector self-regulatory [body] that is to be created in the next few months." The EC had criticised earlier

proposals by the Clinton administration, saying that it failed to take a global approach. At the end of July, the European Commission praised the new plan for a balanced, internationally-constituted membership and board for the non-profit making corporation. It was also delighted at assigning a central role to the World Intellectual Property Organisation in resolving trademark disputes involving internet names. Finally, the Commission urged the internet community to participate in the proposals, saying that the question of the membership and structure of the new corporation should be addressed with the utmost urgency. The US

government's proposal turns over many of the most controversial decisions on the internet's future management to a yet-to-be-formed international board of 15 members.

The board will decide how worldwide web addresses are managed and work out how it will resolve cyberspace trademark disputes. The European Commission, the executive body of the 15-nation European Union, viewed the 30th September deadline proposed by the Clinton administration as "extremely tight" but said it was prepared to help meet that date. The board planned to meet in Singapore in August.

JAN HOWELLS,
VNU NEWSWIRE

short stories



BONE UP ON CHINA

Find out whether you're a rat or a pig at www.chinatown-online.co.uk, a guide to Chinese communities around the world. Chinatown Online has details of restaurants, education listings and services, including information on Chinese history, business and travel. You can learn how to spell your name in Chinese characters, check your horoscope and try the virtual fortune cookie.

RED BRICK NET

Oxford University will offer adult education courses in local history and computing over the internet next spring. Students, from anywhere in the world, will communicate with their tutors via voice conferencing, email and internet chat groups. The university says future courses will include medicine and software engineering but it has no plans to provide online degree courses.

LAST CHANCE FOR BEST 'SCHOOLS SITE'

The search for the best schools web site is almost over. Acorn and Argo are offering schools the chance to win £1000-worth of educational software and hardware: all they have to do is show that their web site is the most effective, imaginative and interactive. Entries should be sent to schoolscomp@argonet.co.uk and must be submitted no later than 25th September.

Yell Top 10 web sites



attachment. There's no voice training required, it's astoundingly accurate, and it's much cheaper than a secretary. It even coped admirably with a Canadian accent. We don't know how they do it, but boy, do we like it.

CyberTranscriber is not only one of the most useful applications for the internet that we've come across in a long time, it's also one of the cleverest. This internet-based dictation transcription service will help you free yourself from the tyranny of the keyboard and the mockery of your more nimble-fingered colleagues. Simply phone in your dictation, and it's sent back to you the next day as an email

1. Beano www.beano.co.uk
2. The Body Shop www.thebodyshop.co.uk
3. Circlemakers www.circlemakers.org
4. CyberTranscriber www.cybertranscriber.com
5. Fisherman's Friend www.fishermansfriend.org
6. Give as You Earn www.giveasyouearn.org
7. RSPCA www.rspca.org.uk
8. Scotland Online www.scotland.net
9. Screens www.screenonline.co.uk
10. Zapit www.zapit.co.uk

Top 10 Products			Last month
Peripherals			
1	Umax Astra 610p	Umax	2
2	V90 Voice/Fx Ext modem	3com	3
3	Astra 1210p	Umax	4
4	Natural Keyboard Elite	Microsoft	-
5	ScanJet 5100c	HP	7
6	Wheelmouse PS2/Serial	Microsoft	-
7	P75 to P200MMX u/g	Evergreen	10
8	Intellimouse V3.0 (95)	Microsoft	-
9	Mitsumi PS2 Mouse	Mitsumi	-
10	Sidewinder Gamepad	Microsoft	-
Windows software			
1	Windows 98 u/g	Microsoft	1
2	Windows Plus! 98	Microsoft	3
3	MS Office Pro+Bookshelf u/g	Microsoft	4
4	Nuts & Bolts (3.1+95)	McAfee	5
5	Office 97 Std C/Vup u/g	Microsoft	7
6	Paintshop Pro V5 FP	Digwork	8
7	AutoRoute 98 UK/Eu	Microsoft	10
8	Windows 98 CD Fp	Microsoft	13
9	PC Anywhere v8 cd	Symantec	14
10	Personal Navigator 95	Softwair	15
DOS software			
1	Corel WP 6.1 Suite u/g Clp	Corel	-
2	Turbo Pascal V7 Dos Educ	Borland	1
3	Ms Mail PC Remote 3.2	Microsoft	-
4	MS DOS V6.22 Upgrade	Microsoft	8
5	DOS 2 Win95 Upgrade	Microsoft	9
6	Corel WP 6.2 U/G	Corel	11
7	SuperCalc V5.5 for DOS	Ca	12
8	Intranetware 2, 5 user u/g	Novell	-
9	Turbo Pascal 7.0	Borland	-
10	Suse Linux 5.2	Red Hat	-
CD ROMS			
1	X-Files Unrestricted Access	EA	1
2	Dance EJay	Fast Track	9
3	Titanic	Guildhall	-
4	Encyclopaedia Britannica	Acclaim	5
5	Mavis Beacon Teaches Typing	Mindscape	-
6	Rave EJay	Fast Track	-
7	Windows 98 Upgrade	Microsoft	-
8	James Bond: Ultimate Dossier	Eidos	-
9	AA Pass First Time	AA	8
10	GCSE Maths	Europress	-
Games			
1	Premier Manager 97/98	Gremlin	-
2	Cannon Fodder	Sold Out	-
3	Commandos: Behind En'y Lines	Eidos	-
4	Titanic: Adventure Out Of Time	Europress	-
5	Carmageddon: Replay	GT Int'tive	-
6	BattleTech: Mech Commander	Microprose	-
7	Lula: The Sexy Empire	Take 2	3
8	Championship Manager 2	Eidos	8
9	Unreal	GT Int'tive	-
10	Worms 2	Microprose	-

Games and CD-ROM figures supplied by HMV. Others from Software Warehouse

GAMES

Fight WWII in the air with MS Flight Simulator

Flight-sim lovers are in for a big treat with the next version of Microsoft's popular DIY pilot program. The new edition of Flight Simulator will be a **World War II historical air combat** simulation, including eight realistically-modelled aircraft. Players will experience real-world navigation based on historical information and atlas data. You'll be able to choose from a variety of aerial combat scenarios, aircraft,



▲ **AGE OF EMPIRES II**
DELAYED UNTIL SPRING
 ▼ **AUTUMN LAUNCH FOR**
THE NEW WWII EDITION
OF THE MICROSOFT
FLIGHT SIMULATOR



missions and combat areas. It's due to be released in the autumn.

Coming soon from Codemasters is **Colin McRae Rally** (the only official game of the champion rally driver). Players will roar around the track at speeds of up to 160mph and compete in gruelling international rally championships consisting of 48 individual stages in eight countries. The game features four 4-wheel and four 2-wheel drive rally cars, with a further four bonus cars. Visit www.colinmcrac.com.

Sierra Studios' epic

game of city building in the Roman era, **Caesar II**, has been so successful that it is planning to release a sequel. Available in October, **Caesar III** will allow players to build and maintain Roman cities, develop armies, defend their territory and earn promotion, ultimately to the rank of Caesar.

And more news on the development of another strategy game, Microsoft's **Age of Empires II**. The release date has been put back to spring 1999, but if it's anything like the original version, it should be

worth the wait. Age of Empires II spans a thousand years of human history, allowing players to control the destiny of humankind from the fall of Rome through to the Middle Ages. Starting with minimal resources, players are challenged to build their nations into great cultures. There are several ways to win, including conquering enemy civilisations, accumulating wealth by extensive trading and diplomacy, building and defending wonders of the world, or protecting a king or queen.

ETELKA CLARK

Reviewed games (p311): Unreal, My Teacher is an Alien, Xenocracy, Might & Magic VI, Commandos, and Gex 3D.

Ghoulish games

Flesh Feast is a new action-strategy game. Players must kill hideous corpses that have come to life to prey on humans — not a game for the squeamish! Watch out for a review in Screenplay, soon.