Home comforts

THE PC IS MAKING A COMEBACK INTO YOUR LIVING ROOM SAYS LIAM PROVEN, AND THIS TIME IT'S HERE TO STAY.

THE WINTEL PARTNERSHIP somehow seems to be able to drink from the elixir of digital PC life like no other computer platform. Despite its often unwieldy interface and aesthetically-challenged looks, the PC still reigns supreme over the computing world and has outlived numerous predictions of its demise. But now a new breed of device is rapidly making its way onto the scene, and this time it's not being hyped as a challenger, but rather as a complementary device. It is the home appliance computer. A device that will be more easy to use than a PC, and integrate more effectively with existing home entertainment products or even kitchen appliances.

Ironically, the first PCs occupied the same type of space in our homes as these new appliances are expected to occupy. Let's take a bit of a history lesson. The earliest home computers appeared in the 1980s with milestone products such as the Apple II, the first complete microcomputer for under $1,000, and the Sinclair ZX-81 and ZX-Spectrum, which squeezed in at under £100. These early eight-bit machines didn't really do much, and despite advertising claims that they could be used for home economics, balancing your bank account, writing letters and indexing your record collection, the main use was soon established: games. Although dedicated consoles could sometimes do better, the fact that these home computers could be programmed by their owners led to an explosion in creativity. Amateur programmers turned professional, new companies appeared, and the breadth of software available multiplied.

Unfortunately, keeping prices low and retaining compatibility stifled technical progress. Eight-bit machines gave way to 16-bit devices such as the Atari ST and Commodore Amiga, but ultimately, the technological initiative moved on. A new generation of 32-bit games consoles took over the home market, providing near-arcade quality audio-visuals and gameplay to a predominantly teenage audience (see 'Rise of the superconsole' box later in this feature). The PC became not only the standard business PC, running suites such as Microsoft Office, but also the most common home computer, used for letter-writing, Internet access, multimedia and games.

ILLUSTRATION SHONAGH RAE

Higher-resolution graphics meant the new breed of PCs needed their own high-spec monitors, and so the PC moved away from the living room where the early computers were used with an RF output plugging into the TV, and into the bedroom or spare room.

Naturally, the PC's great strength is that it's modular and expandable. Kit it out with a high-performance 3D accelerator and decent monitor, a high-quality sound system and lots of fast local storage, and a modern PC can provide a very impressive gameplaying experience.

However, all this makes for an expensive machine and a considerable amount of tweaking

The Icebox may not keep your food cold, but it will give you Internet access, email, and DVD playback

to get it all working together. For a fraction of the price, a dedicated console performs well, especially at lower TV resolutions. Machines such as the Sony Playstation, Nintendo 64 or Sega Dreamcast are cheap and powerful, and their simplicity lends them robustness. There's no bootup or shutdown sequence, and with few moving parts, there's little to go wrong. Even with their basic specifications, they're sold at a loss to make them a more attractive purchase: manufacturers recoup the money on sales of the games. No wonder that in most homes the games console replaced the home computer under the TV.

However, PCs and games consoles both have drawbacks. PCs are complicated, comparatively hard to use, failure-prone and require a high specification to run Windows. Consoles are cheap, easy and reliable, but specialised – typically, they can play games and perhaps audio CDs and nothing else.

The new breed

This is where the new range of home computer appliances fit in. They must have the ease of use of a console, yet much of the flexibility of a PC. This is how a new wave of manufacturers believe the computer will find its way back into the front room beside the TV set. They want to create a simple, dedicated plug-in-and-go machine that allows users to access the main Internet services – email and web-browsing – and perhaps also provide entertainment such as games and MP3 or DVD playback.

One of the first, Netpliance's iOpener (www.netpliance.com/iopener), has already been highly successful in the US, although not in the way the company planned.

The iOpener is a sleek desktop unit, consisting of little more than a 10in 800 x 600 resolution LCD and a keyboard. Hidden behind the display is a notebook-PC-type motherboard based on a 200MHz IDT WinChip, with PS/2, USB and parallel ports. It has 32MB of RAM and a 16MB Flash disk containing the QNX operating system. (A demonstration version is available from www.qnx.com that fits the OS, a dialup TCP/IP stack and web browser onto a single floppy.)

Netpliance plans to sell the iOpener at a loss-making $99 and make its money from the associated Internet service the machine requires: a $21.95-a-month subscription plus a usage charge of $5.95 per hour. Initially, it was possible to buy the machine and cancel the Internet service. A Linux hacker, Ken Segler, took apart his iOpener and discovered that the machine has an EIDE hard-disk interface, so you could fit a 2.5in hard disk and an external network adaptor, converting the machine into a sleek PC. To protect its revenues, Netpliance has modified the design to make this more difficult, and the Internet account is now mandatory, but the device remains an elegant and easy way onto the Internet.

Another company designing home computer appliances is Vestel (www.vestel-usa.com). This is a new company established by a large Turkish electronics manufacturer. Its Internet appliances are also x86-based, but run Windows CE. There are four versions: two integrated into conventional home appliances, the Internet.TV and Internet.Phone, and the standalone Internet.Terminal, which is available in LCD and CRT versions. Like the iOpener, all have integrated 56K modems.

One of the most exciting processor designs for this new breed of home devices is National Semiconductor's Geode chip. Originally designed by Cyrix, which sold it as the MediaGX, it integrates a 6x86 CPU core, graphics, sound and I/O controllers into a single device: a 'PC on a chip'. As little else other than memory need be added to make a complete system, the Geode is ideal for compact devices.

NatSemi has already produced a few exciting prototype units that use the processor. Perhaps the most minimal of these is the WebPad (www.national.com/appinfo/solutions/index.html). This is an A4-sized colour touch-screen which runs on batteries and uses a wireless

Rise of the superconsole

PC technology isn't a prerequisite; it's equally viable to go the other way and enhance a games console for Internet use.

The first such device to ship was Sega's Dreamcast, the coin-op company's attempt to leap ahead of the Playstation and Nintendo 64 after disastrous sales of its 32-bit Saturn console. Based on a 200MHz Hitachi SH4 CPU, partnered with NEC PowerVR2 3D graphics and ARM7-based sound controllers, it's almost an enhanced games-playing PDA. It even runs a cut-down version of Windows CE, tailored for the console hardware and with the Windows GUI removed. Together with DirectX 5 support, this enables games to be developed on PC hardware using Visual C++ or other tools and easily cross-compiled, or even ported from the PC.

The machine ships with a 33.6K modem as standard and can be used to send and receive email and browse the web as well as multiplayer online games, although Sega has yet to truly deliver any games which fully harness the power of online gaming.

Although more proprietary internally, Sony's Playstation 2 has USB, FireWire and a Type 3 PC Card slot. Sony claims that Internet access isn't a primary function and there's no modem, but a PC Card Ethernet adaptor will allow connection to broadband Internet services such as cable modems or ADSL.

The PS2 can be used as a DVD player, too. The unit is expected to hit European shelves in September.

network connection to offer web and email access. The Webpad uses Be's BeIA operating system (www.be.com/products/beappliance). This is a desktop OS and as such is a lot more memory-hungry (it needs 32MB of RAM) than systems like QNX or Windows CE which were designed for embedded use. This means it offers rich support for media such as MP3 audio, AVI, Indeo and QuickTime video as will as OpenGL 3D graphics.

The WebPad is something of a specialist tool, but the Geode chip is also used in Merinta's iBrow (www.merinta.com). Merinta is the Internet-appliance division of thin client manufacturer Boundless Technologies (www.boundless.com). The unit is a small desktop device with an LCD and a separate keyboard with a built-in trackball. It's currently being bundled with an Internet service and resold in the US by VirginConnect as the Webplayer (www.virginconnectme.com). There's also a set-top box version for use with a TV, marketed by WebSurfer as the Innovator Net Top Box (www.websurfer.com).

The WebPad concept isn't new. British manufacturer Acorn demonstrated a similar device, the NewsPad, based on the StrongARM processor and RISC-OS (www.riscos.com). It also produced a range of thin clients based on the same technology, which is still in active development even though Acorn is no more.

The biggest battle may not be fought over hardware, but rather over the territory of the OS. QNX, Windows CE, BeOS and RISC-OS are all contenders for the OS of choice for this new wave of home appliances. Because they're complete operating systems in their own right (see 'Lightweight operating systems' box), they all have the potential to support additional software – everything from viewers for Internet content such as Macromedia's Shockwave or Adobe Acrobat's PDF right up to simple productivity applications and games. Some even offer Java support.

Although most of these new home appliances lack permanent local storage such as a hard disk, this isn't insurmountable – for example, PDAs typically keep their small applications in RAM disks. Several companies are working on tiny lightweight versions of Linux too.

Specialist uses

However, if the device is intended for more specialist functions than general Internet use, flexibility isn't a problem, and even the modest requirements of these systems can be dramatically reduced by using specially-developed proprietary software.

An example of this is CMI's Icebox (www.cmiworldwide.com/iceHome.html), an information appliance for the kitchen. The designers previously worked on products such as breadmakers and juice extractors, and this shows in the Icebox's design. As well as a wireless keyboard, it has a remote control, and both of these are waterproof and even washable. The 'Ice' in the name stands for Information, Communications and Entertainment. As well as web access and email, the Icebox is a TV set and cable receiver and a CD and DVD player. Using an optional video camera, it can even function as a closed-circuit TV system. Web access is provided through a special portal site that also offers related services such as cookery advice and online shopping. There are two versions on offer – an inexpensive CRT-based standalone unit for the retail market and a more expensive slimline variant with a flip-down LCD flat screen which is intended to be built into a fitted kitchen.

Not all home appliances will be as complex as the Ice box. Web access places fairly high demands on a device. It must have a large screen offering at least VGA resolution and colour for most web pages to be usable, together with a moderately powerful processor and a megabyte or so of memory to be able to render pages and their embedded graphics. A pointing device is also essential.

However, a device intended solely for sending

Lightweight operating systems

It's easier to buy in the operating system for an information appliance than to build your own. Designing an operating system isn't as complex as it sounds, but providing it with device drivers, GUI, Internet connectivity and a web browser is a much bigger job.

Two of the systems used in current appliances, QNX and Wind River's VxWorks, come from the world of Real Time software: control systems which must respond to external signals as they occur. For example, VxWorks was the operating system used in the Mars Pathfinder probe. Guaranteeing response times means keeping the software small and tightly-coded. These 'embedded' systems often have no user interface, but QNX was designed to be Unix-like, including a 'microGUI', Photon and a user interface, Neutrino.

Designed for communications devices, Symbian's EPOC32 is also RT capable, although it's better known as an end-user system for PDAs. In contrast, its closest rival, Microsoft's Windows CE, isn't real-time capable, instead focusing on resembling desktop Windows to both users and programmers. GEOS, used in Nokia's Communicator cellphones, was developed on the Commodore 64, showing how small these systems can get.

Very simple low-specification devices such as email-only terminals use custom-written mini-OSs such as AppForge, but at a cost in flexibility – for example, only simple image attachments can be viewed.

and receiving email needs none of these. A small text display is sufficient, and while a graphical display will be more attractive, colour isn't necessary. This also allows for simpler software, meaning a less powerful processor and memory.

Several companies offer products for this market, comprising little more than a modem, a keyboard and a small LCD. Cidco's MailStation (www.mymailstation.com), which costs around £60, runs for three to six weeks on three AA batteries, handles five separate email accounts and can store around 400 messages in its 512KB of Flash RAM, but you must use Cidco's dialup service (around £60 a year). It has an address book and calculator and can output messages to a serial printer. VTech's Email Postbox (www.unbound communications.com/products) at around £60 is similar, but it adds email filtering and can accept proprietary memory cards to store more messages. The £50 Email Express is a pocket-sized version, minus printer port and card slot, and smallest of all is the yet to be released Email Traveler – a handheld PDA that comes with a combined keyboard and docking station.

The sleek iOpener offers an elegant and easy way onto the Internet

A larger and more elegant desktop alternative is Simpliance's eMailBox. The unit has yet to hit the market, but when it does it will be a freestanding box with a wireless keyboard and the same half VGA-size mono screen as the Psion 5. It will offer automatic scheduled mail collection and a simple GUI with online help.

Amstrad's e-m@iler (www.amstrad.com) is about as sophisticated as email devices get. As well as a hands-free speakerphone and digital answerphone, it can send and receive email, send faxes and drive a printer or send emails to a fax machine for printout. It has a 700-entry address book which can be synchronised with a pocket databank with its own miniature screen and keyboard, although this device can't store postal addresses, limiting its usefulness. The price is subsidised by the mandatory Amserve dialup service as well as on-screen advertising. The dialup service is expensive though (see reviews p91).

Microsoft isn't blind to the potential of the home appliance market, and is now readying its response: a PC-based games console codenamed X-Box. The specs of this unit are still a bit vague. It will be based on an x86-compatible CPU, which was originally rumoured to be an AMD Athlon but Microsoft now says will be a custom-built 600MHz Intel Pentium III or derivative. It will have high-performance graphics provided by a custom nVidia chip, possibly based on the GeForce 256. Figures of over 300 million polygons per second have been mentioned, easily outperforming the Playstation 2's 75 million. There'll also be 64MB of unified RAM, for both program and graphics storage, an 8GB hard disk and a quad-speed DVD-ROM drive. It will run a modified Windows OS, probably based on a heavily cut-down version of Windows 2000, support DirectX, USB and 100Mbits Ethernet, and probably a 56K modem.

Several major PC companies were reportedly shown the design but weren't interested, so Microsoft will be producing the device itself. It has said that, although the device will support multiplayer Internet gaming, it's a pure games machine and is unlikely to offer full Internet access, although it will play DVD movies.

If the X-Box happens in this form, it will be the final blurring of the boundaries between home computers, business computers and games consoles.

There's something for everyone here, from light email users, through occasional non-technically-minded surfers, PC-based workers with a secondary device, to hardcore gamers who want to go online as well. And, of course, the full-spec PC, or Mac, for those who want it all.