



Build your own PC, part III

In the third and final part of our PC building series, Gordon Laing shows you how to install the operating system and ensure your freshly constructed machine performs at its best

Over the past few issues we have been showing you how to go about building a desktop PC from scratch. You may wonder why anyone would want to go to all the hassle of sourcing suitable components, shopping around for the best deal, then spending several hours assembling the system when a powerful PC can be bought off the shelf for a similar outlay and with little associated grief.

You may be able to buy a highly specified package for a bargain-basement price, but doing so will almost certainly require you to compromise. For a start, the components list is likely to be restricted, whereas

building your own PC gives you freedom. As long as they are compatible with each other, you can choose precise components from whichever manufacturer you choose. And when it's a DIY project you can decide whether you'd skimp and have onboard audio then reallocate the budget to an area that's more critical to you, such as extra storage or a better quality monitor.

We've spent the past two issues showing you how to build two systems: a top-of-the-range machine and a budget PC costing less than £1,000 inc VAT. The pricier system contains some of the best parts available and both systems are

excellent all-rounders that will delight the busiest office worker or keep the keenest games addict playing through the night.

Our top PC features a 2.4GHz P4 with 512MB of PC4200 RDRAM memory, while the other houses an Athlon XP 2000+ and 256MB of PC2700 DDR (double data rate) memory. If you're coming to this series for the first time, you can catch up by ordering the first two parts on 01795 414 835.

You will also find that the quote component prices have already dropped, so your final machine will either be considerably cheaper than our original budget or you can use the remaining budget for a faster processor or more memory. Having completed the physical assembly of both our PCs, in this final part we'll power them up for the first time, install Windows and ensure everything's running smoothly.

1. Powering up

After all the hard work you've put into building your PC, we've finally reached the moment you've been waiting for: turning it on for the first time. Before reaching for the power button, though, you'll need to connect the relevant cables.

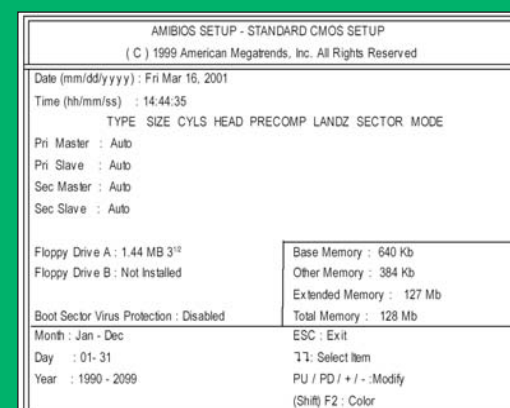
Most obvious is the mains power cable which should be inserted into the back of the power supply. You should also connect

2. Configuring the Bios

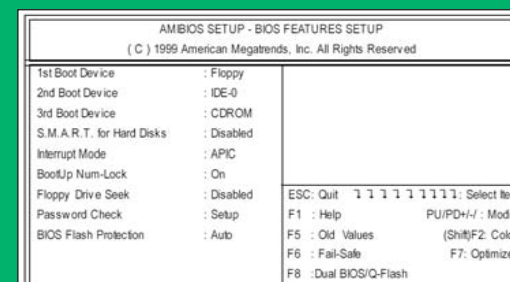
Once your PC is powering up correctly it will stop after a few seconds and state there's an 'invalid system disk' or 'missing system'. This is because you've not yet installed an operating system on the hard disk, in our case Windows XP. Before we can install it we need to tell the motherboard about the devices we've plugged into it. This data is entered into the Bios (also known as the Cmos or Setup) using a series of

onscreen menus. To access these, you need to switch your PC off and on again then tap the Del key until you enter Setup.

The menus are navigated using the arrow keys – press Return to select an option or the Esc key to go back a step. The Page Up and Page Down are used to cycle through various options. Use the motherboard manual as a reference during this process.



1 The first thing to do is to tell your PC what drives you've got installed, along with setting the time and date. If you're building the cheaper system with the Gigabyte GA-7VRXP motherboard, enter the Standard Cmos Setup page or...



3 We must tell our motherboard to boot from the CD-ROM to install Windows. Select CD-ROM as the first or Number One boot device, which can be found in the Bios Features setup page on the Gigabyte (above) or the Boot menu on the Asus motherboard (right). Don't worry that you've fitted a DVD-ROM drive – the motherboard treats it the same as a CD drive. Exit the Bios menu, saving your changes. As your PC reboots, insert the Windows XP CD



2 ...head to the Main menu if you're using the Asus P4T533 motherboard in our higher-end system. In both instances, enter the correct time and date, then set the four Primary and Secondary Master and Slave options to Auto. If you've fitted a floppy drive, ensure this is set to 1.44MB 3.5in. If you're using the Asus P4T533 with our recommended PC4200 RD-RAM memory, you should also head to the Advanced page, select Chip configuration, then Enable the RD-RAM Turbo Mode for the best performance



4. Installing drivers

After installing Windows, you need to install the software drivers which make your various devices work properly. The most important drivers are for the chipset on your motherboard, which allow your PC to perform at its best.

Insert the CD supplied with your motherboard and follow its instructions. If you're using the Gigabyte GA-7VRXP motherboard, install the VIA 4-in-1 drivers first. If you're using the Asus P4T533 motherboard, install the Intel Chipset software utility first

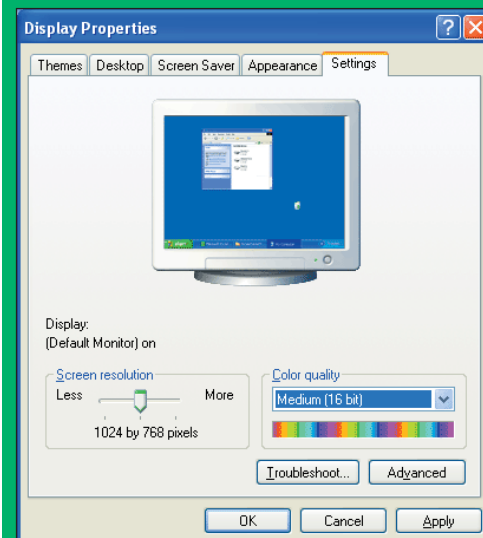
After installation and rebooting your PC again, you can go about installing the drivers for the other components built into your motherboard. Depending on which version of the motherboard you bought, these could include onboard audio, Raid and/or USB 2.0 connectivity. Again follow the instructions in your motherboard manual.



5. Installing graphics and other drivers

After installing your motherboard drivers you can go about getting all your other devices working properly. The best place to start is your graphics card, which has a driver CD. After installing this and restarting your PC, you'll be able to access the full features of your graphics card.

In your Display Control Panel, click on the Settings tab (see below). We recommend increasing your colours to 16bit (or 32bit if you're going to be editing



photos or video) and adjusting the Screen resolution to 1,024x768 pixels. When you click Apply, the screen will attempt to display your new settings. Click ok to accept them. The 19in Sony monitor used in the higher-end system should handle a higher resolution setting of 1,280x1,024 pixels, but you can keep it at 1,024x768 if you prefer

Finally, it's time to install the drivers for any other internal devices you may have included in your system. In our systems all that's remaining

is the internal modems which, with any luck, the Windows XP installation will have taken care of. Check the Phones and Modem Control Panel and you should see your modem listed as a Conexant chipset device. If not, run the Add Hardware Control Panel, manually choose modems from the list and choose to install drivers from a specific location, browsing to the Windows XP folder on the CD supplied with the modem.

your monitor cable to the graphics card and ensure it is switched on. Connect your keyboard and mouse to either the PS/2 or USB ports on the rear of the case, depending on which versions you bought. Finally flick the switch on the back of the power supply to On, then press the power button on the front of the PC case.

If everything goes to plan your PC will whirr into life, beep once and, after a couple of seconds, the screen should display information about your processor, drives and memory. In many cases nothing will appear on the screen or your PC may start beeping continuously. This indicates that something is not plugged in properly or may be missing entirely – this could include memory, processor, any cards and the fan for your processor. The number of beeps can be cross-referenced in the motherboard's manual to give you a better idea of what's wrong.

Sometimes even tightening a screw during installation can pop a card out of its slot and prevent the PC from starting. Remember not to make any adjustments until the power is off though.

3. Installing Windows XP

Installing Windows XP is a painless process that takes around an hour. If you've completed step two correctly your rebooted PC will either ask if you want to boot from the CD (the answer is Yes), or

Essentials

- Tools **Phillips-head screwdriver, antistatic wriststrap.**
- Benefits **Building your own PC gives you the perfect specification at a reasonable price. It's also a great lesson in PC hardware and good fun, too.**
- Cost **£1,000 and £2,000 respectively including VAT for the configurations quoted.**
- Time required **Approximately half a day for this part; approximately one day for the entire three-part process.**
- Difficulty level **Medium – software installation and configuration is the easiest part of building your own PC**
- Tips **Patience! Software installations take time, especially with multiple restarts.**

start running it automatically. After loading some basic files for around 90 seconds, you'll be asked to press Enter to setup Windows XP. After agreeing to the licence, Windows asks where the operating system should be installed and should present your entire hard disk as unpartitioned space. If your disk has already been partitioned, delete the sectors to produce unpartitioned space.

You have the choice of either allocating all of the disk's space to become a huge C drive or to make multiple partitions. If you opt for the latter, you'll need to manually create a new partition and say how big you'd like it to be – this will be your C drive for Windows itself and should be at least 10GB. Remember that you can create extra partitions later. If you're happy with the C drive occupying the entire disk

space press Enter to automatically partition and install Windows.

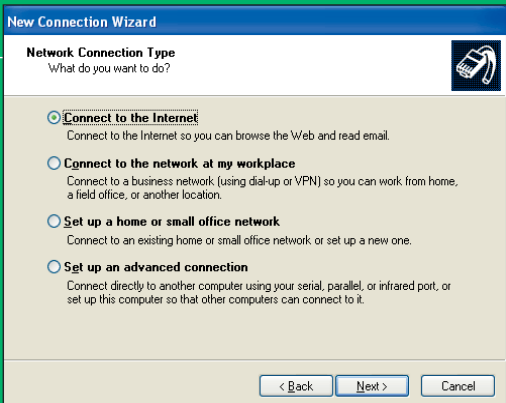
Depending on whether the disk has been partitioned previously, you may be asked if you'd like to use the NTFS or FAT32 file systems – we recommend NTFS for better reliability. Windows will then format the new partition which could take up to 60 minutes depending on its size.

Once formatted, the Windows Setup will start and prompt you for a number of details including your name, location, time zone and serial number. The installation will also restart your PC a few times and blank the screen for several seconds at a time – this is perfectly normal and you should just follow the onscreen instructions. This main setup process takes around 30 minutes on a modern PC.

Once the Windows installation is complete, you may wish to go back into your Bios (see step two) and set your hard disk to be the first boot device to speed up startup times.

7. Setting up an internet account

A PC without internet access is unthinkable these days. Without the communication, information and technical support the web affords you you're really not making the most of your machine. The first step in getting online is choosing an ISP. Whichever provider you opt for, it will normally have a bundled CD that guides you through installation. In many cases, though, you don't need to use the ISP's CD to get online – all you need is a username, password and telephone number to dial. Many ISPs will give you this information over the phone or in a letter. You can then enter these details into Windows' New Connection Wizard, which starts the first time you click on Internet Explorer after installing Windows, or by selecting it from the Start menu, by going to Programs, Accessories, Internet Tools.



↑ Many people prefer to enter these details manually, as it prevents the ISP from customising their browser and email programs

6. Connecting external peripherals

Our budgets of £1,000 and £2,000 inc VAT were spent on the main PC systems themselves. If you've decided to buy a printer, scanner or any other external peripherals, now is the time to install

them. Most modern peripherals are plug and play. Connect them to the relevant port on your PC then install the supplied drivers. Always read the instructions first though, as many devices prefer their software to be installed before you connect them.

8. Installing applications

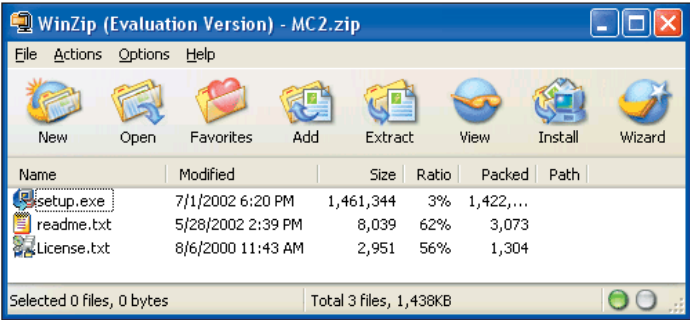
With your PC now fully operational it's time to install your applications. In all the excitement of budgeting for the best hardware, you may find yourself short of cash to buy well-known programs. If this is

the case then help is at hand. While Microsoft Office is a superb application suite, there are cheaper alternatives. How about Sun's OpenOffice.org, for instance, which is totally free of charge? Amazingly OpenOffice.org offers a fully featured word processor, spreadsheet and presentation graphics programs all of which are compatible with Microsoft Office, along with an HTML editor, maths software and a drawing package. If money's too tight to mention, or you fancy an alternative to Microsoft, head over to www.openoffice.org.

9. Essential utilities

On the subject of low-priced software, no PC would be complete without a selection of indispensable utilities. Once installed, you'll wonder how you ever coped without these gems. Most utilities can be downloaded from the web for free or installed directly from our cover CD.

→ Once your PC is up and running, download WinZip – a handy file compression tool that we in the *PC Advisor* offices can't do without



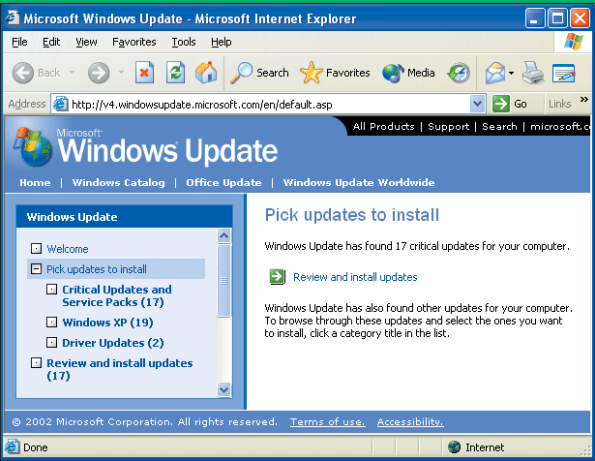
Our favourites include the ubiquitous file compression tool, WinZip (www.winzip.com), the popular Instant Messenger from AOL, AIM (www.aim.com), RealPlayer, an alternative to Microsoft's Media Player (www.real.com), Acrobat, for reading PDF documents (www.adobe.co.uk), Winamp, a fabulous audio player (www.winamp.com) and ZoneAlarm, a firewall to protect users with ADSL or cable modems from hackers (www.zonelabs.com).

10. And relax!

With your PC fully built, operational and installed with the best software, it's time to sit back, relax and congratulate yourself on a job well done! All that's left is for you to enjoy using your new system, although do read through our section on keeping it running smoothly. Finally, don't forget to check out our news and reviews of the best software and peripherals for your new PC. ■

How to ensure your PC runs smoothly

Every PC, whether homemade or shop bought, needs regular maintenance in order to keep it running smoothly. Antivirus software is essential, but you don't need to hand over your credit card for peace of mind. AVG Anti-Virus is free of charge and pays for itself by tagging a signature with a link to its website at the end of your emails. Download a copy from www.grisoft.com, but ensure the updater runs at least every fortnight so it can recognise the latest enemies. Software drivers, applications and operating systems also have regular updates to solve problems or improve performance. The appropriately named Windows Update provides easy access to the current fixes and patches for Windows and Office applications. New graphics drivers can significantly improve your system's 3D gaming performance, so it's worth checking your graphics chipset manufacturer's website every few months for any updates. If you're using an nVidia chipset (such as in our example systems), head over to the driver section at www.nvidia.com. If you're using an ATI chipset, go to www.atitech.com. Via also provides updated drivers for its chipsets at www.viarena.com. If you're using a motherboard with a Via chipset, such as the Gigabyte GA-7VRXP in our cheaper system, check every couple of months for an updated 4-in-1 driver at this website. If on the other hand, your motherboard doesn't seem to like a new device you're trying to install, then you may need to update its Bios. Fortunately, modern motherboards, such as



↑ Find Microsoft Windows Update under Programs in Windows XP's Start menu the ones we've recommended in our two systems, are supplied with utilities which can automatically search for an updated Bios on the internet and install it. Finally with all your files being copied or deleted every day, it's worth giving your hard disk a little TLC. Defragmenting is the process of optimising the position of files on a disk and should be performed every six months or so. You can find Windows XP's defragmenter in the System Tools section by clicking on Start, Accessories. Note this process can take several hours to complete.

Spec for spec: high-end system

- Processor
Intel Pentium 4 2.4GHz;
www.dabs.com; **£331.**
- Heatsink and fan
Alpha PAL892T;
www.overclockers.co.uk;
01782 339 600; £34.65.
Sanyo-Denki 80mm fan;
www.overclockers.co.uk;
01782 339 600; £9.80.
- Memory card
256MB PC4200 Samsung;
www.overclockers.co.uk;
01782 339 600; £100.
- Motherboard
Asus P4T533 with 256MB of PC4200 RDRAM;
www.dabs.com; **£170.**
- Graphics card
Gainward 128MB GeForce4 PowerPack Ultra/750XP;
www.komplett.co.uk; **£286.**
- Hard drive
Seagate Barracuda IV Ultra DMA 100 80GB;
www.dabs.com; **£75.**
- DVD-ROM drive
Pioneer DVD-106S;
www.overclockers.co.uk;
01782 339 600; £37.
- CD-RW drive
Ricoh MP7320A-DP;
www.jungle.com; **£50.**
- Floppy disk
Teac 3.5in 1.44MB;
www.overclockers.co.uk;
01782 339 600; £8.40.
- Ethernet card
Dabs Value 10/100 PCI;
www.dabs.com; **£5.50.**
- PCI card
Dabs Value internal 56K PCI card;
www.dabs.com; **£10.**
- Monitor
Sony CPD-E430; www.sony-cp.com; **0870 5424 424; £249.**
- PC case
Coolermaster ATCS-201;
www.overclockers.co.uk;
01782 339 600; £110.
- Power supply unit
Enermax 431 Watt;
www.overclockers.co.uk;
01782 339 600; £65.
- Operating system
Windows XP Home edition;
www.dabs.com; **£139.**
- Keyboard and mouse
Logitech Cordless Desktop;
www.dabs.com; **£39.**

budget system

- Processor
AMD Athlon XP 2000+;
www.dabs.com; **£102.**
- Heatsink
Akasa AK-821 2Q Silent Cooler;
www.overclockers.co.uk;
01782 339 600; £17.
- Memory card
256MB PC2700 Dimm;
www.dabs.com; **£50.**
- Motherboard
Gigabyte GA-7VRXP;
www.dabs.com; **£76.**
- Graphics card
Gainward 64MB GeForce4 PowerPack Pro/650TV;
www.komplett.co.uk; **£62.**
- Hard drive
Seagate Barracuda IV Ultra DMA 100 40GB;
www.dabs.com; **£53.**
- DVD-ROM drive
Pioneer DVD-106S;
www.overclockers.co.uk;
01782 339 600; £37.
- Floppy disk
Teac 3.5in 1.44MB;
www.overclockers.co.uk;
01782 339 600; £8.40.
- PCI card
Dabs Value internal 56K PCI card;
www.dabs.com; **£10.**
- Monitor
Iiyama Vision Master Pro 1413; www.iiyama.co.uk; **01438 745 482; £139.**
- PC case
Coolermaster ATCS-201;
www.overclockers.co.uk;
01782 339 600; £110.
- Power supply unit
Enermax 350 Watt;
www.overclockers.co.uk;
01782 339 600; £43.
- Operating system
Windows XP Home edition;
www.dabs.com; **£139.**
- Keyboard and mouse
Microsoft internet Keyboard PS/2;
www.dabs.com; **£12.**
- Microsoft Internet
Trekker Wheel Mouse;
www.dabs.com; **£12.**