GETTING YOUR COMPUTER UP AND RUNNING

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At first sight desktop computers seem very complex, but they are really quite simple. Understanding the purpose of each component and the way that they are put together will help you get the best from your system.

External features

PC with a standard desktop case.

Monitor

By default graphics accelerator (VGA) monitors run at a resolution of 640×480 pixels (dots) on the screen. Super VGA monitors can be set to run at higher resolutions—for example, 800×600 or 1024×768. These resolutions allow more detail to be displayed on the screen, although text may become too small to read comfortably on a standard 14" monitor. Higher resolutions are therefore best used on larger screens.

System box

This houses all the main components of the computer such as the motherboard, processor, memory, and hard disk as well as all the expansion cards and optional extras—for example, the CD ROM drive.

Switches and buttons

Keyboard lock—A key operated switch which disables the keyboard. Not as useful as it seems because the keys are often interchangeable.

Reset button—This switch instantly restarts the computer, which can be useful if a program locks for any reason. Pushing the button accidentally will result in permanent loss of all unsaved work.

Turbo—Far from speeding things up, this button actually slows the computer down. It is provided because some very old programs will not run at high speed but is rarely needed or used.

Floppy drive

Floppy disks are used to transfer information and programs into and out of a computer. Older 5¼" disks were literally flexible and vulnerable to damage. Modern 3½" disks have a hard plastic case that protects them. Standard double sided high density floppy disks can store up to 1.44 megabytes of information.

Before a floppy disk can be used it has to be formatted—a process in which the disk is divided into segments which the computer uses to store data. All computers can format disks, although each disk takes a minute or more. You can buy preformatted disks but these are more expensive.

CD ROM drive

This drive is used to read all types of CD ROM (compact disk read only memory). Many suites of programs such as Microsoft Office are now provided on CD ROM as these would otherwise have to be supplied on a large number of floppy disks. The CD ROM drive in the figure is mounted in a 5¼" drive bay, which could also be used for a tape streamer.

Different types of disk.

Alt key	This selects an alternative function. For example, in windows programs holding down the Alt key and then pressing E (often written as Alt-E) activates the edit menu rather than putting the letter E on the page
Ctrl key	The control key is used in a similar way to the Alt key. For example, in Windows Ctrl-P prints the document
Esc key	Pressing escape usually cancels a selection or exits from a programme
F1 to F12	Function keys are used to select specific functions. For example, pressing F10 in Word-perfect for DOS saves the document
↑ ←	The arrow keys move the cursor around the screen
Insert	Toggles between typeover and insert mode. In typeover mode new characters overwrite those on the screen whereas in insert mode they are inserted into the text
Home	Used in combination with arrow keys to move cursor to top of the page, beginning of the line, etc
Page up & page down	Move the cursor up and down one page at a time
End	Moves cursor to end of the line
Delete	Deletes characters to the right of the cursor
Backspace	Deletes characters to the left of the cursor
Numeric keypad	Fast and convenient way of entering numbers. the four basic arithmetic functions are on the surrounding keys
↵	The carriage return and enter keys are completely interchangeable

The keyboard.

Mouse

A mouse is essential for controlling graphical user interfaces such as Windows. The mouse contains a rolling ball, and moving it across the desk moves an arrow shaped pointer around the screen. Most have two buttons. The left button is normally used to select or activate any object that you point to. Clicking the right button usually brings up a function menu.

The mouse.

Inside the computer

Inside of a computer..

Motherboard—This is the main circuit board on to which other parts of the computer are attached.

Processor—This is the heart of the computer (see article p 46, 1 July).

Memory or RAM—Computers use single in-line memory modules which plug into sockets on the motherboard. Additional modules can easily be inserted into empty sockets. They are available in both 32 and 72 pin versions, which are not interchangeable.

Hard disk—An essential part of the computer where programs are stored. Hard disks have far greater capacity and work much faster than floppy disks. When your hard disk is full, an additional hard disk can be added or disk compression software used to pack more data into your existing hard disk.

Expansion card.

Expansion cards—These are used to connect the motherboard to essential peripherals (hard and floppy disk drives, serial and parallel ports, and the monitor) and to optional extras (CD ROM drive, modem, tape streamer, sound card, or scanner). It is very easy to plug additional expansion cards into free sockets.

Speaker—The standard internal speaker is adequate for warning bleeps and simple tones. To listen to more sophisticated sound, such as speech and music (which are an essential part of multimedia), you will need to install a sound card and hi fi speakers.

Back of the computer

Back of the computer.

Fan—Noisy but essential to keep the inside of the computer cool.

Power—The mains lead plugs into one socket. The other similar looking socket supplies switched mains power from the computer to the monitor so that there is no need to switch off the monitor each time you turn off the computer.

VGA output—Connect the monitor here.

Serial port—There are usually two serial sockets, which can have either 9 or 25 pins. One is used for the mouse. The other can be used to connect an external modem or to link two computers using a null modem cable.

Parallel port—Most computers have just one parallel port, which is used to connect the computer to the printer.

Keyboard socket—5 pin DIN socket used for the keyboard.

Removing the lid of your computer does not invalidate the guarantee, as is the case with much electrical equipment.

Switching on

Drive labels

A:\	First floppy drive
B:\	Second floppy drive if installed
C:\	Main hard disk
D:\	Further letters are used for additional hard disks, RAM disk, CD ROM drive, or network drive
E:\	
F:\	

When the computer is turned on, it automatically runs a series of tests to ensure that all its components are plugged in and working properly. Once this has been completed it loads the operating system from the first track of the hard disk (known as the boot sector) into memory. This process is known as booting up. The operating system controls the computer and translates commands that you issue in English (such as save or print) into instructions which drive the hardware. Almost all computers are supplied with an operating system known as MS DOS (Microsoft disk operating system), although there are many others. They include:

Windows—Optional extra, which sits on top of DOS and provides a friendly graphical interface to the user.

Windows NT—Completely new, and highly advanced and secure 32 bit operating system aimed at a few specialised corporate applications rather than ordinary users.

Windows 95—New version of Windows which does not need DOS and is designed to take full advantage of modern processors.

IBM OS/2 Warp—Modern operating system sold by IBM which is similar to Windows 95. It can run DOS and Windows programs as well as software specifically written for OS/2.

Unix—Modern 32 bit operating system which allows several people to work on the same computer simultaneously. Many general practice systems are based on it.

The operating system is usually installed by the manufacturer.

Windows 95 makes more use of the graphical user interface.

Filenames

Filenames take the format of up to eight characters with a full stop separating a three character extension. The filename extension gives useful information on the nature of the file.

*EXE, *.COM, and *.BAT indicate files that will run programs
*DOC, *.TXT, and *.WRI are typical document file extensions
*PCX, *.TIF, and *.BMP are extensions for bit mapped graphic files

Configuration files

As the operating system is loading the computer reads two special configuration files called AUTOEXEC.BAT and CONFIG.SYS which tell the computer how to set itself up. During the boot process you will see a lot of rapidly scrolling text on the screen as each of the commands in these configuration files are carried out. This text can usually be ignored. Experienced users sometimes modify configuration files to optimise the operation of the computer. Beginners are advised to leave them alone since errors in these files can result in the computer failing to start. When the computer has finished booting many computers simply display the Prompt (C:\>) until you enter a command. Others will automatically run a menu or proceed directly into windows.

Useful DOS commands

A:	Change the prompt to the A or floppy drive
CD	Change directory—for example, CD MS DOS will change you into the MS DOS directory
CD\	Changes you back to the root directory
Copy SUMMARY.DOC A:	Copies the file SUMMARY.DOC to the floppy disk in drive A
DEL SUMMARY.DOC	Deletes the file SUMMARY.DOC
DIR/P	Lists the directories and files one page at a time
Format A:	Formats the floppy disk in drive A
Help	Displays a help menu giving all available MS DOS commands and instructions on how to use them
MD	Make a new directory—for example, MD LETTERS would create a directory called LETTERS
RD	Remove a directory
UNDELETE	Restores a previously deleted file

At this stage the computer is ready to use. The computer may have come with software already installed, or you may now need to choose which software you are going to buy and use. If the software is installed typing the initial command—for example, "win" for Windows, "wp" for WordPerfect—will start it running.

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Qualitative Research

Rigour and qualitative research

Nicholas Mays, Catherine Pope

This is the second of seven articles describing non-quantitative techniques and showing their value in health research

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Various strategies are available within qualitative research to protect against bias and enhance the reliability of findings. This paper gives examples of the principal approaches and summarises them into a methodological checklist to help readers of reports of qualitative projects to assess the quality of the research.

Criticisms of qualitative research

In the health field—with its strong tradition of biomedical research using conventional, quantitative, and often experimental methods—qualitative research is often criticised for lacking scientific rigour. To label an approach "unscientific" is peculiarly damning in an era when scientific knowledge is generally regarded as the highest form of knowing. The most commonly heard criticisms are, firstly, that qualitative research is merely an assembly of anecdote and personal impressions, strongly subject to researcher bias; secondly, it is argued that qualitative research lacks reproducibility—the research is so personal to the researcher that there is no guarantee that a different researcher would not come to radically different conclusions; and, finally, qualitative research is criticised for lacking generalisability. It is said that qualitative methods tend to generate large amounts of detailed information about a small number of settings.

Is qualitative research different?

The pervasive assumption underlying all these criticisms is that quantitative and qualitative approaches are fundamentally different in their ability to ensure the validity and reliability of their findings. This distinction, however, is more one of degree than of type. The problem of the relation of a piece of research to some presumed underlying "truth" applies to the conduct of any form of social research. "One of the greatest methodological fallacies of the last half century in social research is the belief that science is a particular set of techniques; it is, rather, a state of mind, or attitude, and the organisational conditions which allow that attitude to be expressed."¹ In quantitative data analysis it is possible to generate statistical representations of phenomena which may or may not be fully justified since, just as in qualitative work, they will depend on the judgment and skill of the researcher and the appropriateness to the question answered of the data collected. All research is selective—there is no way that the researcher can in any sense capture the literal truth of events. All research depends on collecting particular sorts of evidence through the prism of particular methods, each of which has its strengths and weaknesses. For example, in a sample survey it is difficult for the researcher to ensure that the questions, categories, and language used in the questionnaire are shared uniformly by respondents and that the replies