

A Technical details

A printer is a device that prints your texts or graphics on paper.

The output on paper or acetate sheets is called **printout** or **hard copy**.

A program in your computer, called the **printer driver**, converts data into a form that your printer can understand.

A **print spooler** stores files to be printed when the printer is ready. It lets you change the order of documents in the queue and cancel specific print jobs.



The output quality, or **resolution**, is measured in **dpi** or dots per inch.

The speed of your printer is measured in **pages per minute (ppm)**.

In a network, users can share a printer connected to a **print server**, a computer that stores the files waiting to be printed.

B Types of printers

A **dot-matrix printer** uses a group, or matrix, of **pins** to create precise dots. A print head containing tiny pins strikes an inked ribbon to make letters and graphics. This **impact printing** technology allows shops, for example, to print multi-part forms such as receipts and invoices, so it's useful when self-copying paper is needed. It has two important disadvantages: noise and a relatively low resolution (from 72 to 180 dpi).



A dot-matrix printer

An **ink-jet** (also called **bubble-jet**) printer generates an image by spraying tiny, precise drops of ink onto the paper. The resolution ranges from 300 to 1,200 dpi, suitable for small quantities or home use.

A standard ink-jet has a three-colour **cartridge**, plus a black cartridge. Professional ink-jets have five-colour cartridges, plus black; some can print in wide format, ranging from 60 cm up to 5 metres (e.g. for printing advertising graphics).

Some ink-jet based printers can perform more than one task. They are called **multi-function printers** because they can work as a scanner, a fax and a photocopier as well as a printer. Some units accept memory cards and print photos directly from a camera.



An ink-jet printer and ink cartridges

A **laser printer** uses a laser beam to fix the ink to the paper. A laser works like a photocopier; a powder called **toner** is attracted to paper by an electrostatic charge and then fused on by a hot roller.

Laser printers are fast and produce a high resolution of 1,200 to 2,400 dpi, so they are ideal for businesses and for proofing professional graphics work.

Lasers use a **page description language** or **PDL** which describes how to print the text and draw the images on the page. The best-known languages are Adobe PostScript and HP Printer Control Language.

A professional **imagesetter** is a typesetting printer that generates very high-resolution output (over 3,540 dpi) on paper or microfilm. It's used for high-quality publications.

A **plotter** is a special type of printer which uses ink and fine pens held in a carriage to draw detailed designs on paper. It's used in computer-aided design, maps, 3-D technical illustrations, etc.



A plotter

6.1 Complete these sentences with words from A opposite.

- 1 The differences in are noticeable: the more dots per inch, the clearer the image.
- 2 A print resolution of between 600 and 2,400 ensured that even text as small as 2 pt was legible.
- 3 Passengers with an electronic ticket will need a of ticket confirmation or a boarding pass to be admitted to secured gate areas.
- 4 The key advance of recent years is printing speed: the latest generation of ink-jets prints black-and-white text at 15 (.....).
- 5 With appropriate software, you can view the images on a computer, manipulate them, or send them to a and produce excellent quality colour copies.
- 6 A is a dedicated computer that connects a printer to a network. It enables users to share printing resources.
- 7 A is a utility that organizes and arranges any documents waiting to be printed.
- 8 In computers, a is a program installed to control a particular type of printer.

6.2 Choose the most appropriate type of printer for these situations from the descriptions in B opposite.

- 1 a home user who wants to print text documents and family photographs
- 2 business people who need to print in large quantities at high quality in an office
- 3 engineers who want to make detailed line drawings
- 4 professional typesetters in desktop publishing (e.g. to publish catalogues and magazines)
- 5 a company that wants to print carbon copies of bills and receipts

6.3 Find terms in B opposite which correspond to these definitions.

- 1 a container that holds the ink in an ink-jet printer
- 2 powdered ink used in laser printers
- 3 small needles that press on the inked ribbon to make the characters on paper
- 4 printer technology that produces text and pictures by hammering pins against a ribbon and the paper
- 5 a language that tells a printer how to print a document
- 6 a peripheral which combines a printer, a fax machine and photocopying and scanning capability into one device



Dangerous laser printers

You and computers

Describe the characteristics of the printer that you have or would like to have at home or at work.

Give details about: type of printer, speed, resolution, ink cartridges, price and customer support.

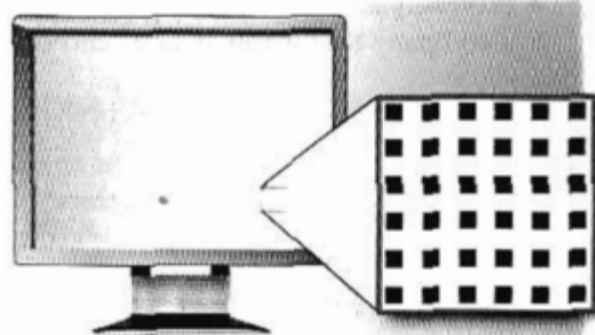
A

CRTs and LCDs

The screen of a computer is often known as the **monitor**, or **VDU** (visual display unit). Inside the computer, there is a **video card** which processes images and sends signals to the monitor.

When choosing a monitor, you have to take into account a few basics.

- **Type of display** – the choice is between a **CRT** or an **LCD** screen.
The **Cathode Ray Tube** of a monitor is similar to a traditional TV set. It has three electron guns (one for each **primary colour**: red, green and blue) that strike the inside of the screen, which is coated with substances called **phosphors**, which glow and create colours. CRTs are cheap, but they are heavy, can flicker and emit radiation.
A **Liquid Crystal Display** is made from flat plates with a liquid crystal solution between them. The crystals block the light in different quantities to create the image. **Active-matrix LCDs** use **TFT** (thin film transistor) technology, in which each pixel has its own transistor switch. They offer better quality and take up less space, so they are replacing CRTs.
- **Screen size** – the viewing area is measured **diagonally**; in other words, a 17" screen measures 17 inches from the top left corner to the bottom right.
- **Resolution** – the clarity of the image depends on the number of **pixels** (short for picture elements) contained on a display, horizontally and vertically. A typical resolution is 1,024 x 768. The sharpness of images is affected by **dot pitch**, the distance between the pixels on the screen, so a dot pitch of 0.28 mm or less will produce a sharp image.
- **Brightness** – the luminance of images is measured in cd/m^2 (candela per square metre).
- **Colour depth** – the number of colours a monitor can display. For example, a **VGA** monitor produces 256 colours, enough for home use; a **SuperVGA** can produce up to 16.7 million colours, so is ideal for photographic work and video games.
- **Refresh rate** – the number of times that the image is drawn each second. If a monitor has a refresh rate of 75 Hertz (Hz), it means that the screen is scanned 75 times per second. If this rate is low, you will notice a flicker, which can cause eye fatigue.



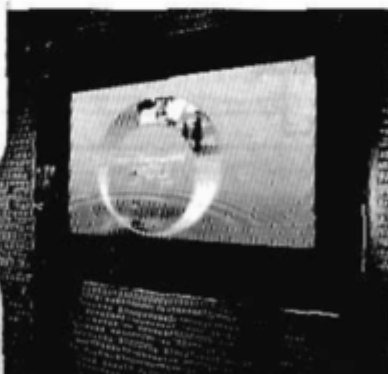
A colour pixel is a combination of red, green and blue subpixels

B

Big screens: plasma and projection TVs

'I sometimes use a video projector in my Geography lessons. I prepare audiovisual presentations on my laptop and then connect it to a front-screen projector which displays the images on a distant screen or white wall.'

'I use a portable DLP projector for my business presentations. This is a digital light-processing device which creates the image with millions of microscopic mirrors arranged on a silicon chip.'



'I am a home cinema enthusiast. I've set up a system with a DVD recorder, speakers for surround sound, and a rear projection TV, which has the video projector and the screen within a large TV box. It's a real cinema experience.'

'I've got a 52-inch plasma display and really enjoy its advantages: high-contrast images and bright colours, generated by a plasma discharge which contains noble, non-harmful gases. Gas-plasma TVs allow for larger screens and wide viewing angles, perfect for movies!'

7.1 Read A opposite and then correct these false statements.

- 1 The images shown on a monitor are not generated by the video card.
- 2 All visible colours can be made from mixing the three primary colours of red, yellow and blue.
- 3 Typical CRT-based displays occupy less space than LCD displays.
- 4 Active-matrix LCDs do not use a technology called thin film transistor or TFT.
- 5 The size of the screen is measured horizontally.

7.2 Match each term with the correct definition.

- 1 phosphors a the frequency at which a monitor renews its image, measured in Hz
- 2 LCD screen b a flat-panel display which works by emitting light through a special liquid
- 3 pixel c the space between a display's pixels
- 4 dot pitch d the smallest element in a displayed image
- 5 refresh rate e materials that emit light and produce colours when they are activated by an electron beam


7.3 Complete the technical specifications of this monitor with words from A opposite.

Quick specs

The new Paintview XT-85 combines a television and a computer (1) _____ in one display.

Type of display	Flat panel LCD
(2) _____	19 inches
(3) Display _____	1,280 x 1,024 pixels
Dot pitch	0.294 mm
(4) _____	16.7 million colours
Contrast ratio	1,000:1
(5) _____	400 nHz
Built-in TV tuner	Yes
Audio	Two 3-watt speakers and a 5-watt subwoofer, headphone jack

The Picture-in-Picture function allows you to watch more than one program at the same time and lets you adjust the size of each window.



7.4 Complete these sentences with words from B opposite.

- 1 If you intend to set up a _____, consider getting a very big screen, a DVD recorder and a good set of speakers.
- 2 A _____ takes digital images and displays them on a screen or wall.
- 3 The company announced plans to expand its _____ (DLP) cinema technology, which has thrilled test audiences with its dazzling colours and pin-sharp images.
- 4 In a _____ TV, a large box contains both the projector and the screen built in.
- 5 The gas mixture in a _____ is not dangerous.

You and computers

Describe the 'home cinema' of your dreams. Use these notes to help you.

- Type of display: CRT television, LCD screen, plasma TV or video projector
- Screen size
- Resolution (image quality)
- Video source: TV, VCR or DVD recorder
- Sound capabilities

