



## Some day my prints will come

... is what you may frustratedly be thinking, but without any idea of how to go about buying or upgrading a laser printer. Fear not, however, for Eleanor Turton-Hill is on hand to show you what to look out for.

Laser printers used to be huge, expensive pieces of equipment found only in the offices of large corporates and graphics bureaux, but now they're small desktop devices producing a higher quality of output than ever before. More importantly, laser printers are finally affordable to small businesses and home users. In fact, you can now pick up a laser printer from your local dealer for as little as £300.

Laser printers work in pretty much the same way as photocopiers, using a laser beam to produce the final result. The major difference is that instead of copying an image, the image is created in the computer and sent down a cable to the printer. Laser printers have three major advantages over other types of printers: they're fast, they're quiet, and they produce the best-quality output.

Like most other products in the computer industry, laser printers are buried in a confusing swamp of technobabble and jargon. Here's a rough guide to help you translate some of the strange speech used by your dealer.

### GDI (Graphical Device Interface) Printers

One technological change which helped push the price of the laser printer down was the use of GDI technology. GDI printers use an innovative printing method whereby rasterisation takes place in the host PC rather than in the printer itself. Traditionally, the printer would have a whole load of complex electronics built into it to process incoming data, but in a GDI

printer all this work is done on your PC. This makes printing a more direct process because GDI cuts out the intermediary translation process which most printers use. Instead, it uses Graphical Device Interface code directly from Windows.

Despite the recent enthusiasm for GDI, the technology does have some major disadvantages. The most obvious is that GDI printers operate under Windows only. You can print from DOS applications, but only if they're running in a window, and then only with additional emulation (usually an early version of printer control language). Additionally, GDI printers are heavily dependent upon the host processor. This is usually listed amongst the advantages of GDI because the faster your processor, the faster the printed output. However, processor dependence cuts both ways: if you've got a slow processor, you'll have slow printing.

### Quality of output

Several factors influence output quality, but the major one is the resolution capability of your printer. Until recently, 300dpi (dots per inch) was about the best you could expect from an office printer, but now the market is littered with 600dpi printers. These will give you significantly better results, particularly when printing scanned images or graphics. At 600dpi, four times the number of dots are produced per inch of paper, resulting in a smoother tone gradation and a final image which looks pretty much like a black and white photograph.

Another factor which will affect the qual-

ity of your printer output is the use of edge-enhancement techniques. These are used by some laser printers to adjust the arrangement of dots on the page, so that stepped edges are smoothed out, making the resulting print appear to have a higher resolution. This works by modulating the power of the laser to fill in the dots at the edges of characters with smaller dots so as to produce crisper looking text and smoother images. Different manufacturers have their own forms of this. RET (Resolution Enhancement Technology) belongs to Hewlett Packard, but others you may come across are PQET (Print Quality Enhancement Technology), used by Lexmark, and FEIT (Fujitsu Enhanced Imaging Technology). Many printer manufacturers use these edge-enhancement methods to improve the quality of 300dpi output. This is worth looking out for, especially if you print a lot of complex graphics, but remember to compare the price with a true 600dpi printer — the price difference is often small.

### Paper

High-resolution printers are all well and good, but their performance is restricted by the quality of paper you use. The jagged edges of unenhanced 300dpi print become visible when using ordinary copier-grade bond paper. At 600dpi (or enhanced 300dpi) the quality improves, but any higher resolution than this will not be noticed unless you invest in a better quality paper.

Having said this, laser printers are not affected by paper quality to the same extent as inkjet printers. The way inkjets fire ink directly at the paper means that poor-quality absorbent paper leads to visible feathering of characters. With laser printers the print quality never quite suffers to this extent, but smoother paper will noticeably improve resolution, especially when using high dpi levels.

Poor-quality paper can produce side effects when used in laser printers. The drum inside the printer can become scratched, rapidly wearing out the surface and leading to deterioration in print quality and, finally, replacement of the drum. It's important to follow the manual's guidelines as regards paper quality and weight, which is usually recommended as 75gsm copier paper which costs about £2.50 for 500 sheets. Better quality paper at 80 or 90gsm costs more than twice this amount.

The way in which paper is stored is important because extreme heat or humidity can affect the way in which it feeds through the printer. Curled or damp paper

will soon cause paper jams and seize up the system. There are other considerations when it comes to paper. If you do a lot of printing on heavy paper or card, then you should take note of the way in which the paper passes through the printer. The normal paper path involves turning the sheet through an S-shaped bend, but many lasers include a straight-through path which prevents the paper from curling as it travels through the machine. Others provide an envelope feeder, too, which will allow you to stack and feed multiple envelopes so you don't have to feed them through singly, by hand.

### Upgrading

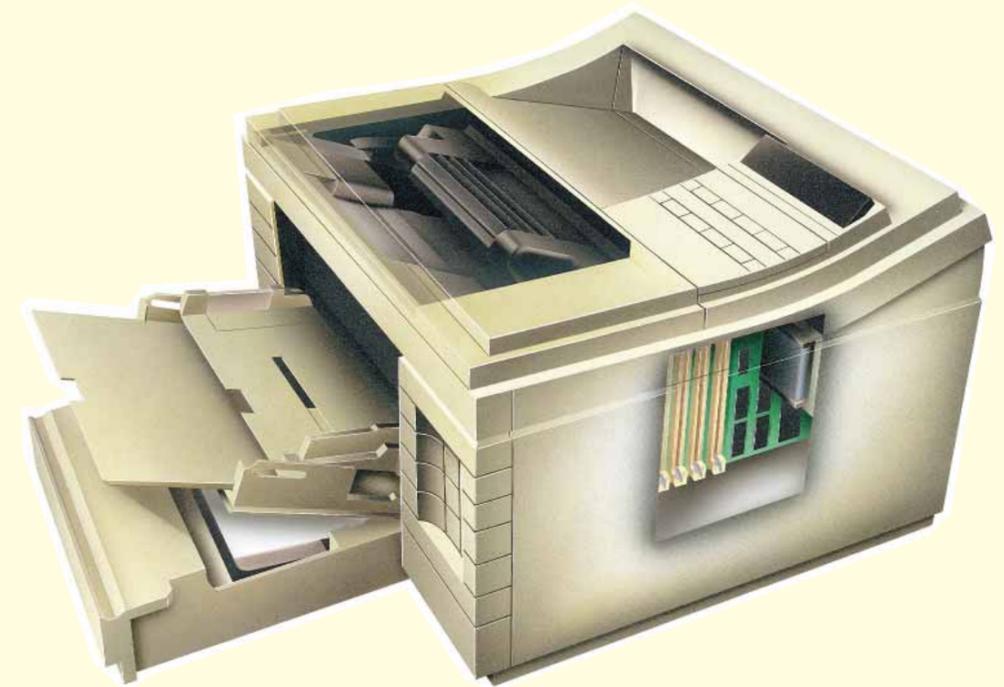
If your printer does almost everything you need but lacks functions in certain areas, then you could consider upgrading as an option rather than spending vast amounts of money on a new machine. Lots of accessories and extras are available for printers including font cartridges, memory, and various networking add-ons.

### Memory

One point to check when you buy a printer is the amount of memory it has, and to what extent it's upgradable. The printer should come with at least 512Kb of memory, but if you print full-page graphics, make sure you have 1Mb — if you make heavy use of soft fonts or Postscript, buy 2Mb to 4Mb. If you do buy a printer with a small memory, make sure it's upgradable to 2Mb in case your needs change later, and check whether the printer will accept industry-standard SIMMs (Single Inline Memory Modules). This type of memory can be obtained from a number of manufacturers and is usually cheap, whereas some printer manufacturers force you to buy their own proprietary memory on circuit boards or chips, sometimes costing extortionate amounts of money.

### Fonts

Fonts can be a bit of a minefield if you want to upgrade. The first thing you should be aware of is how many resident fonts



you have in your printer. These are the fonts that are hard-wired into the printer, and most lasers come with at least six. Sometimes, printer ads are a little deceptive when it comes to resident fonts, often claiming to have an unbelievable number of them. This is because 14pt Times Roman is counted as a different font from 12pt Times Roman, and each point size underlined, italicised, lightened or boldened is counted as yet another. Always ask the dealer for a list of the typefaces so that you know exactly what it is you are being offered.

When it comes to upgrading your font options, you need to look at non-resident fonts. These come in three forms: bitmapped fonts on cartridges, bitmapped fonts as software (soft fonts) and scalable fonts. Font cartridges fit nicely into a slot in the printer and are faster than software-based fonts. They don't demand any extra memory or take up hard disk space, but unfortunately, are more expensive and less flexible than soft fonts. However, it's wise to make sure that upgrading your font collection with a cartridge is an option, so check that the printer accepts HP Laserjet II cartridges as these have become the industry standard and are widely available. Soft fonts are cheaper than cartridge based fonts, but they take up space on your hard disk and must be loaded into printer memory each time you use them. This is okay if you have the space, but can otherwise be a hidden

cost. Soft fonts can be easily manipulated, mixed and matched on the page, and in this respect they're better than cartridge fonts but not as good as scalable fonts.

The fact that cartridge fonts and soft fonts are bitmapped means that the point size of each font is stored in a separate and unchangeable file, whereas scalable fonts (as the name implies) can be rendered in any point size. PostScript provides the best option if you want to produce complex graphics or text which wraps itself around circles for instance. The cheapest PostScript printer will generally cost over £500, so it's often cheaper to upgrade than it is to buy a new one — but only just.

Upgrading can be done in a variety of different ways depending on what printer you already have, and how much aggravation you're willing to put up with. The easiest (but not necessarily the cheapest) way is to buy a PostScript cartridge. This will require 2Mb to 4Mb of memory, so the cost will depend on what memory you already have in your printer. A cheaper way of upgrading is to buy a software PostScript emulator. These are sometimes difficult to fine tune and they tend to be memory-hungry, both on your system and on your printer. They can produce good results, but can be inconsistent depending on the level of true PostScript compatibility.

For a detailed guide to products, see our laser printer group test next month.