Digital Printing

by Derek Fordred

Analogue Typesetting and Printing

Analogue typesetting includes everything from manual typewriters, through Varitypers, IBM Executive typewriters, IBM Composers and some phototypesetters. Analogue devices are now becoming obsolete. Although the input to some of these devices could be considered as digital (e.g. punched tape) the output is produced by analogue methods (metal type or a photographic master). Some of these items will be covered in the section on Cold Type Setting but this section will be devoted to digital methods of producing text.

Digital Composing

Digital composition can be divided into several parts, in the same way that other printing processes are divided: the preparation of the text, the layout of the pages and illustrations, and the printing of a paper proof, artwork master, or even the whole print run. Alternatively a plate for subsequent printing by another process can be produced (though the printing part of the procedure would be by traditional lithography or even letterpress). This composition is normally carried out using a computer and a desktop publishing (DTP) program.

Layout

The dimensions of the publication need to be decided at the outset. Once the paper size is fixed, the text area for the page can be decided and items such as running headlines and page numbering can be set up. With any publication consisting of more than a single sheet of paper it is necessary to view pairs of pages side by side and most DTP programs will allow working in this mode. Methods for producing good page layouts have been understood for over 100 years and any major departure from traditional layouts needs careful consideration.

Composition of Text

Text may be composed using any text processing program, from simple editing utilities such as Windows Notepad to dedicated DTP software. If a separate program is used for the initial text setting, it is later imported into a DTP package where the page layout is set up and text formatting takes place.

Once the page size for the publication has been decided decisions about the typeface and point size to be used can be made. Information on appropriate fonts and suitable line lengths has already been provided. If your publication is to be sent as a computer file to a commercial printer for final printing, it is important to choose a font to which the printer has access. If the printer substitutes another typeface, your page layout will not be maintained.

Sources of Fonts

It is best to avoid cheap fonts where possible. Some of the problems you might experience are:

Poor fit between characters (bad spacing);

Characters missing from the font (some fonts look as if they were designed for a specific requirement and important characters are omitted);

Lack of matching special characters and symbols;
Lack of matching 'expert' fonts.

Fonts from the main commercial suppliers (Agfa Monotype, Adobe, ITC etc.) are not expensive and a large number of good typefaces is included with most DTP packages.

Some typeface families include a so-called 'expert' font, but it will need to be purchased separately if required. The expert font usually contains Small Caps (A, B, c, D) ligatures (ff, fi, fl, ffi, ffl), fractions (%, 3/s, 1/3, 2/3 etc.), old-style (non-aligning) figures, figures for split fractions, etc.

Don't install hundreds of fonts on your computer and spend some time clearing out fonts for which you no longer have any use. Large numbers of fonts can slow down your machine or cause other problems. Make sure that the font you use is readable. Some faces are not ideally suited to laser printing, especially on a printer with low resolution, whereas others have been designed with laser printing in mind.

Designing your own fonts

It is possible to design your own font, though the exercise can be very time consuming and should not be taken on lightly. However, font design programs can be useful where it is necessary to add special characters to a standard font. They can also been used where a font is not available and a limited range of characters is needed for a publication (for instance, a title page).

The two main players in this market are Fontographer and Fontlab. Both programs are expensive so they are unsuitable for casual use and there is some doubt about Fontographer's future, as Macromedia seem to be doing their best to ignore the product, having failed to update it since the mid-1990s. There are some shareware alternatives at reasonable prices, but I have not tried them so cannot vouch for their quality.

Previous experience of a vector drawing program would be one of the most useful skills to possess for using this type of software.

DTP Programs

There are a number of good DTP programs available. Here is a partial list with guide prices (2003):

Quark Express. Top of the range program used in most professional offices. Very expensive (over £800).

Pagemaker. Another high end package, though less expensive than Quark, it is still over £300. Has now been replaced by InDesign.

Serif PagePlus. A low end program with many professional features. Cost less than £100.

Microsoft Publisher. Another low-cost program which I have found particularly easy to use. *Small Printer* was typeset using Microsoft Publisher from 1998 to 2002. Cost less than £100.

Word Processors

Word processors should not be used for serious Desktop Publishing. With a word processor, you have virtually no control over the layout of your publication, as they are usually not frames-based. The use of a frames-based program means that when you place an object (say a picture or a drawing) on a page, it stays put. Word processors tend to move

objects around unasked. If you want to be in charge, use a proper frame-based publishing program. If you are producing a single page document that is largely plain text you might get away with a word processor.

Laser Printers

The price/performance ratio reduces roughly every six months (remember when laser printers were 150 dpi and cost several thousands of pounds?). Performance increases either in available resolution or speed (pages per minute). Laser printers are often referred to as 'page printers' because a page is printed in one cycle of the printing mechanism. This is in contrast to inkjet printers that print line by line.

Arguments rage between some manufacturers about 'total cost of ownership'. Those claiming lower costs do so by claiming a very long life for the internal components of the printer. Others include these parts in the replaceable toner cartridge. I feel that the latter system is preferable for the ultimate in quality of reproduction. Above all, ask to see a sample of the print produced before you buy, and view it under a magnifying glass.

A useful feature on a laser printer is a 'straight through' paper path. This path is normally from the hand feed tray at the front and a tray at the back of the printer. This feed is particularly useful for feeding card. I have even used this path to print on book cloth. Newer printers should have several different driver settings to suit different materials. Higher temperatures or slower speeds are needed to fuse the toner on to card compared with normal copier paper.

As an aside, if you spill toner on your clothes, brush off as much as possible and wash in *cold* water; hot water will fuse the toner onto the cloth (and your hands).

The current mid-range printer (June 2003) runs at 18 pages per minute at a resolution of 1200 dpi. Within a month I expect this to increase to 24 pages per minute. If you can afford the extra, buy a printer with a duplex unit fitted which will print sequentially on both sides of the paper. This is very useful for saving paper. Higher end printers run up to 50 pages per minute and usually cater for A3 printing.

Cleaning instructions for the printer will be included in the manual (if you get one). It is becoming common for manufacturers not to supply a paper manual but to include a file on a CD supplied with the printer. There will generally be a cleaning program built into the printer so check the manual for advice. There will also be warnings about keeping your greasy fingers off some parts of the printer (transfer roller, etc.).

Apart from cleaning, various parts of the printer might need changing from time to time. Warnings about low toner and the need to replace other components usually appear on an LCD screen on the front of the printer. The manual will normally provide instructions for replacing the components involved.

Some printer makers give dire warnings about using recycled toner cartridges including the invalidation of the maker's warranty. Some people won't use them, others use them all the time — you have to make up your own mind. Whatever you use, dispose of your old cartridge sensibly. Most large stores will now accept old cartridges for recycling and there are a number of charities that collect them.

Colour Laser Printers

Until a relatively short time ago, colour laser printers were out of the reach of individuals and small organisations. Today it is possible to obtain a printer from around £300 + VAT, little more than the cost of a high-end inkjet printer. The advantages are higher speed (from 4 pages per minute in colour) and a cost per page for mono printing comparable with a mono laser printer. The printed result is also waterproof, unlike most inks for inkjet printers. Including consumable costs, I estimate the cost of an A4 colour laser page to be from around 8p at today's prices. High-speed colour printers (16-23 pages per minute) are also now becoming available at low prices. The increased speed has been achieved by a change in the internal design of the printer.

Early colour laser printers produced the four colour CMYK images (Cyan, Magenta, Yellow and blacK or Key) sequentially, building up a complete colour image in four revolutions of the mechanism. The newer printers use an "in-line" design, where the four images are laid down (almost) simultaneously, thus speeding up the process by four times.

Digital Photocopiers

Photocopiers are frequently used for final printing of a publication. Both analogue and digital photocopiers are now available, but there are several advantages to be obtained from the digital variety. Not all digital copiers will have all' the following features:

Scan once, print many. Considerable timesavings can be made for multiple copies on a digital copier.

Re-sizing of copies. Analogue copiers use a zoom lens to change image size, but a digital copier doesn't require complex optical arrangements.

Use as a printer/scanner. A digital copier can be used as a local or network printer. Some copiers include this option; others require the purchase of an interface board and/or software.

A copier can sometimes be used as a high-speed digital scanner, useful if complex cleaning up of paper images is needed.

Higher speed copiers often include additional facilities, e.g.:

- The loading of several different types of paper for a job including the ability to print on transparencies and card.
- The automatic insertion of covers and separator sheets (usually coloured paper).
- Stapling of papers (corner stapling, double stapling and saddle stapling). Saddle stapling includes the option to fold the sheets to form a booklet, though the number of sheets that can be folded and stapled will be limited.
- Copier charge codes to allow the charging of jobs to particular departments or customers.
- The ability to link two copiers together to automatically share the work load.
- The ability to recover after the removal of a paper jam either in the feeder or in the printing unit, without losing pages.

Colour copiers are now available (at a price) with most of the facilities listed above and with speeds up to 60 pages per minute