



# Type casting

**If you thought Sans Serif was a resort in Spain, read on. Gordon Laing tells you things you always wanted to know about fonts but were afraid to ask.**

**“T**ypographic arrangement should achieve for the reader what voice tone conveys to the listener.”

We're talking about fonts — I can't get enough of the things. However much my colleagues snigger at my obsession, I know they have a secret yearning to join me in a little typographic trainspotting. You see, they're really into it, too. It's just that they don't yet realise it.

With the advent of personal computers, graphical user interfaces and vector page description languages (such as PostScript, the digital typeface) are an everyday reality. All Windows and Macintosh users take scalability, what-you-see-is-what-you-get and smooth output for granted.

But like most aspects of computing, there's a fair amount of technology working behind the scenes. Unsurprisingly, there are also competing formats and implementations, each fighting for your attention.

It's always handy to understand the inner workings, and it's been a while since the subject's been covered, so this month's *Graphics & DTP* is everything you wanted to know about fonts but were afraid to ask.

## Font or fount?

So, what is a font? Those with active vocabularies will almost certainly think of baptism, but as far as typefaces are concerned, the dictionary immediately passes the

buck on to the word “fount”, which it describes as “a complete assortment of types of one sort, with all that is necessary for printing in that kind of letter”.

The word fount comes from the Latin, “to cast”. Indeed, much of electronic publishing terminology harks back to the old days of the printing press. The part about “all that is necessary for printing” refers to the old, individually cast, characters; one for each style and size. The word “font” is an Americanism of “fount”, but in its electronic form means much the same thing, in that each comes with “all that is necessary for printing”.

## Serif or sans-serif?

There was a time, not so long ago, when all computers were limited to displaying one font on their monitors. Similar to mechanical typewriters, all the letters took up the same amount of space on the page, regardless of their actual size. This is known as mono or non-proportional spacing.

Look at the letters m and i. The i is much narrower, but occupies the same space on the page as any other letter in a non-proportional system. This extra space looked messy and spurred type designers to artificially widen the narrower characters to fill the gaps. The design they came up with for typewriters was Courier, a style familiar to all of us and over-used in recent times to convey a retro or Mission Impossible-type mood.

At the time, most printers came with the option of choosing from a couple of built-in fonts. These were usually selected by a switch on the printer and were described simply as Serif, or Sans-serif. Serifs are lines or curves projecting from the end of a letterform. Fonts with these additional strokes are known as serif fonts.

The word “serif” is derived from the chiseling marks found in Roman stone monuments; indeed, serif fonts are often referred to as Roman. However, uncapsitised roman describes vertical characters as opposed to italic. Italic characters slope to the right and are often known as oblique.

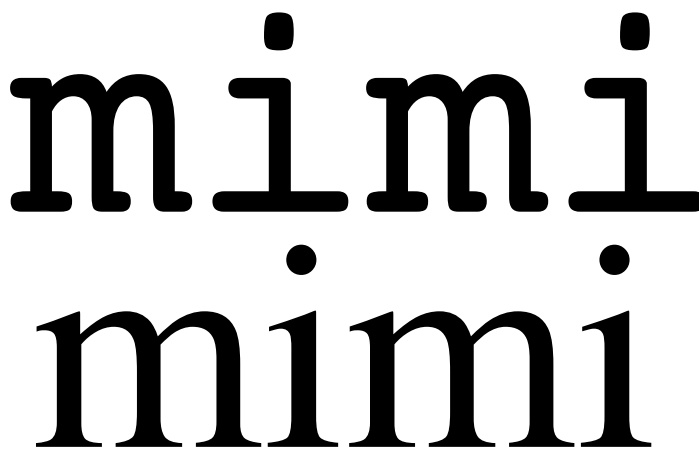
“Sans” is the French word meaning “without”; making sans-serif fonts those without the additional strokes. Probably the most famous sans-serif font is Helvetica (or Arial).

Times is the best known serif font. Studies have shown that at body-text sizes, serif fonts are easier to read — the idea being that the serifs help guide the eye from letter to letter. At larger or smaller than body-text sizes, sans-serif fonts seem to work better.

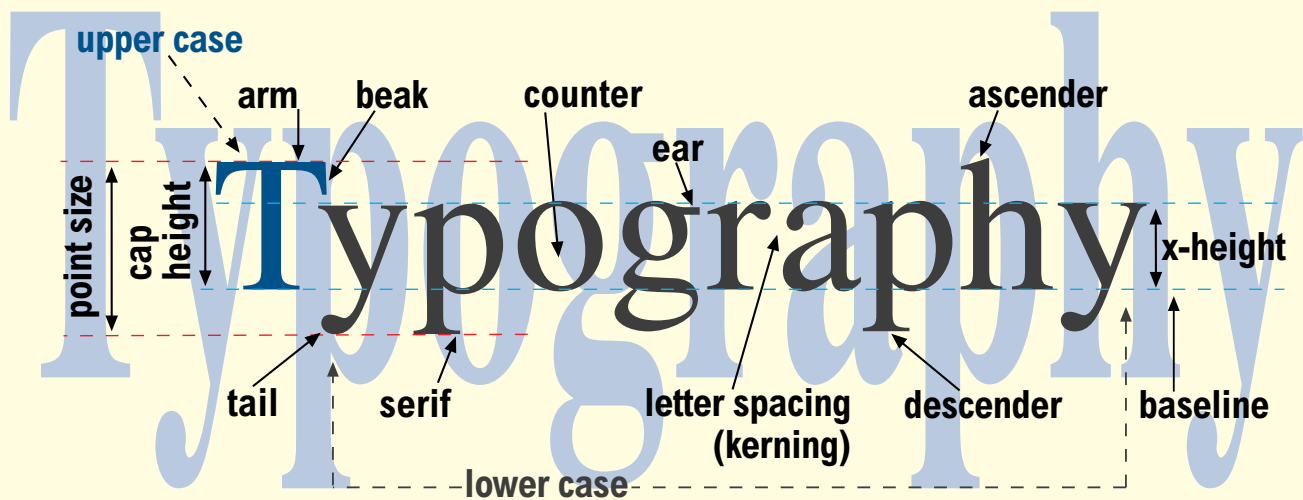
## The advent of WYSIWYG

Proportional spacing and scalable fonts arrived on the desktop around 1984 courtesy of Adobe, just one year after it developed the PostScript page description language.

The shape of each character in Adobe's Type 1



*Who's Mimi? For now, a demonstration of proportional spaced fonts. The letter m is usually the widest character, and the letter i the thinnest. At the top is Courier, a non-proportionally spaced font. Notice how the serifs are artificially widened to make all characters the same width. Below is Times, a proportionally spaced font, with naturally thin i's and wide m's. Out of interest, a wide dash is known typographically as an em dash, since it is the same width as a letter m in that font style; narrow dashes are en dashes*



font format is described by a PostScript program. These descriptions can be displayed and printed at any resolution, in any colour and at any degree of rotation. Each character incorporates spacing information.

Type 1 fonts also contain hinting information. Certain line weights and serifs may look great on characters output at two inches high but could look fiddly, or even illegible, at smaller sizes. Hinting is the process of adding information to a character's outline, slightly altering various aspects to improve its appearance at low resolutions and point sizes.

PostScript software and Type 1 fonts are device independent, meaning they are not tied to a specific device or resolution. The same Type 1 font can be used for a 72dpi display screen, a 300dpi laser printer or a 2400dpi imagesetter. In order to be printed or displayed it must still be turned into a bitmap, but the same single outline description can be used for all devices; one very flexible file, requiring little space and offering the desirable prospect of consistency across devices.

The process of turning a vector outline (such as a Type 1 font) into a bitmap at the desired resolution for printing, or display, is known as rasterisation. If you wanted to view or print the shape, it needed to be rasterised into a bitmap. PostScript printers could rasterise Type 1 fonts for printing, but for a while nothing could do it for on-screen use. Each Type 1 font consisted of several files: one for the vector outline (useful for the printer alone), and a small collection of pre-rasterised bitmaps for on-screen use. Hence the terms "printer font" and "screen font".

When a size was chosen for which a bitmap didn't exist, the on-screen result appeared jagged. Imagine zooming in and out of documents, effectively requesting countless bitmaps at obscure sizes: it

looked like we were stuck with the jaggies for a while.

Then, in 1989, Adobe Type Manager (ATM) arrived. It took outline printer fonts and rasterised them on the fly, at any resolution, for on-screen use. This apparently processor-intensive task was absorbed by faster hardware becoming available, and any pause of a couple of seconds as the screen re-drew was more than compensated for by the smooth and accurate font shapes.

ATM could even rasterise Type 1 fonts for non-PostScript printers. Under Windows, it even handled the installation and management of Type 1 fonts — a totally invaluable utility for Windows or Macintosh users of Type 1 fonts.

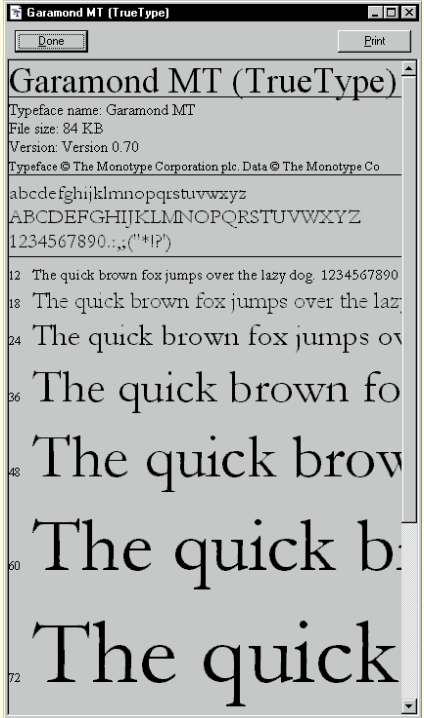
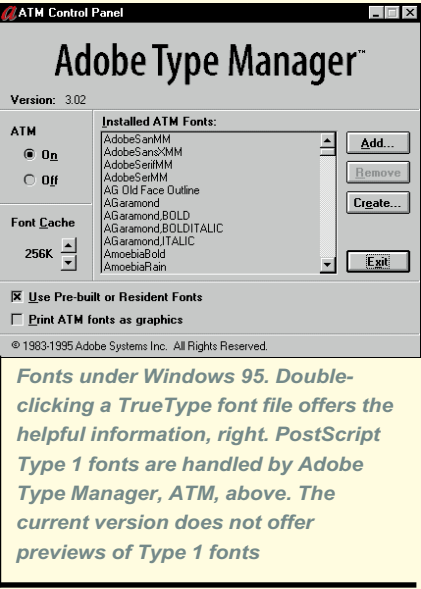
**Just my type**

You'd be forgiven for thinking the digital type world consisted entirely of fonts encoded in Adobe's Type 1 format. While Type 1 was the original and remains the standard in professional publishing, other

formats and implementations sprung up to compete.

TrueType was developed as a joint venture by Apple and Microsoft. Windows 3.x, NT, 95 and Macintosh System 7.x operating systems come with a rasteriser for TrueType, but not Type 1 fonts. ATM is the only rasteriser for Type 1 fonts, costs £40, and is bundled with many applications, notably those from Lotus and, unsurprisingly, Adobe. Incidentally, ATM is built into IBM's OS/2.

TrueType fonts do not require accompanying pre-rasterised bitmaps on either Windows or Macintosh. It is possible, but not recommended, to use Type 1 fonts on a Macintosh without ATM. On such a Mac, the system relies on screen fonts for display and that's why all Macintosh Type 1 fonts must have at least one pre-rasterised bitmap screen font for compatibility. Since



## Font of the Month

## FF Meta+

ABCDEFGHIJKLMNOPQRSTUVWXYZ

a b c d e f g h i j k l m n o p q r s t u v w x y z ß &amp; 1 2 3 4 5 6 7 8 9 0

Windows requires ATM to install Type 1 fonts (which can also rasterise them), bitmaps are not required.

Each OS happily operates with TrueType and Type 1 fonts simultaneously — even in the same document. But which is better?

Adobe claims that ATM is relatively more intelligent than the TrueType rasterisers. Consequently, Type 1 fonts can be smaller in file size than TrueType and take less time to download to a printer. Smaller file sizes require less space on your hard disk, too. On the other hand, Windows only downloads the actual characters of a TrueType font used in a document, whereas ATM downloads the whole character set.

PostScript and Type 1 still dominates the professional printing world. It's been around longest and consequently has an almost religious following in publishing circles. Although TrueType is catching up fast, there are currently more fonts available in the Type 1 format.

In publishing, there's the big issue of making sure the people who print your pages have exactly the same fonts you've used on your document. Missing fonts, resulting in substitution and reflow, is a surprisingly common nightmare. Merely sharing the same names isn't enough: the fonts have to come from the same foundry and supplier and this level of certainty is only truly offered by Type 1. One big endorsement comes from the International Standards Organisation, which in ISO specification 9541 identifies Adobe's Type 1 format as the worldwide standard for outline fonts.

Of course, if you're outputting only to a local printer or aren't bothered about absolute perfection, then any format will do. In this situation, it boils down to price and availability. There are a huge number of budget collections, more often than not in TrueType format, many consisting of subtly different copies of famous *proper* fonts.

Serious typographers will gasp with horror that anyone could even consider using these imposters. but they're more than sufficient for the majority of users.

**Bitmaps — the last word**

With scalable outline fonts galore, you'd wonder whether it's worth bothering with bitmaps ever again. The answer is a resounding, "kind-of".

Many Windows and Macintosh system fonts are bitmaps — they're the ones you find on title bars, on menus and under icons. They look fine at that fixed size but try to scale them and the jagged edges will reveal themselves.

FON files are Windows bitmap fonts without accompanying outlines. They may consist of bitmaps at a number of sizes and are often used within email messages to ensure compatibility with as many other systems as possible.

Adobe Type 3 fonts are bitmap descriptions not requiring ATM but are rarely seen these days. One small advantage over Type 1 and TrueType is their ability to contain anything other than a solid fill — they could have a pattern of some kind.

A final word on file extensions. TTFs are, unsurprisingly, the TrueType outline files while Type 1 Windows fonts consist typically of two files: PFM and PFB. The PFB is the outline description, while the PFM contains information about the font such as letter spacing.

Next month we'll take a further look at fonts, including character sets and the many gems the Internet has to offer.

**Font of the Month**

Typographer Eric Spiekermann's aversion to Helvetica as a corporate typeface is well known. His alternative, Meta, was designed in 1991 and has become Fontworks' best-selling typeface. Eric has revised his original design, adding additional weights and cleaning up the kerning and some outlines. The result is the fabulous FF Meta+ (*pictured above*), exclusively available from FontWorks.

**PCW Contacts**

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