

WINDOWS FONTS

More Choices, More Confusion

BY GALEN GRUMAN REVIEW BOARD

Font technology inhabits a netherworld in computer technology. Everyone sees the results in documents, especially since virtually all word processors, desktop publishing programs, and graphics programs support myriad typefaces.

Because of the popularity of fonts, a typewritten letter or memo now looks unprofessional. Resident printer fonts, downloadable soft fonts, and font cartridges have taken the printing public by storm. Fonts are no longer a province of typographers and graphic artists highly trained in arcane ways. Today, anyone can use — or abuse — the technology. Yet the technology that makes fonts accessible remains largely hidden from users. At the same time, a stream of news continues regarding the emergence of new font technology and "font wars" between Microsoft, Adobe, IBM, and others.

Since Windows is a graphical environment, fonts have been a focal point for many Windows applications. They all tout WYSIWYG capabilities, many offer their own fonts in addition to Windows system fonts, and third parties such as Hewlett-Packard and Bitstream have offered their own proprietary downloadable soft font lines.

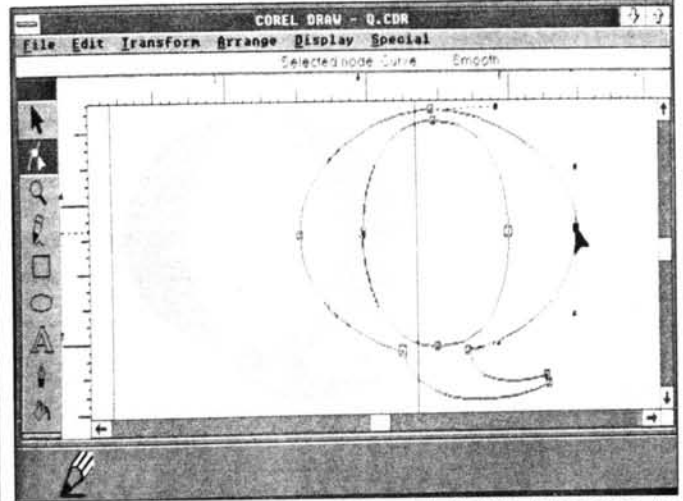
Yet, ironically, fonts has been one of

Windows' most criticized features, thanks to an enigmatic implementation and lack of integration of native vs. third-party soft fonts and printer font cartridges.

Screen and printer fonts are forever tied together but often work and appear differently. Working with them rarely produces reliable or consistent results. While some capabilities match that of the Macintosh, the Mac's integration of font technology is infinitely more seamless than that of Windows.

Let's look at some of these problems, some of your options, and how Windows 3.0 now deals with the issue.

WHY YOU SHOULD CARE. Until Microsoft and Apple announced the intention to develop a common font rendering technology (first called Royal, now True Type), the basic font technology on a PC was stable: You used bit-mapped fonts for limited printers such as Laserjets and dot-matrix printers, and outline fonts for high-quality Postscript laser printers and typesetters. This is now changing. Primarily, there is an industrywide move to outline fonts that let you render any font size on the fly for both the screen and printer (no matter what kind) and manipulate type as if it were graphics. All the major players have or are developing such type managers that support Microsoft Windows, including Adobe Type Manager, Hewlett-Packard/Agfa Compugraph-



This screen shows an outline and a bit-map character in Corel Draw's France font. The outline ultimately becomes the bit map when output.

ic's Type Director, Bitstream's Speedo, and the promised True Type.

Also, there are now affordable printers to support outline font technology. The most significant case in point is HP's new Laserjet III, which very effectively brings this technology to the largest market segment in the PC world. And Adobe's decision to make the hinting technology in its fonts available to the public (surrendering to the pressure of the Apple/Microsoft True Type effort) means that Postscript-capable printers should finally decline in price.

With these technologies accessible for general use, you can expect to see all sorts of applications — from word processors to spreadsheets to desktop publishers — take advantage of their benefits, much as the introduction of color and graphics monitors changed the monochrome, text-based nature of software.

HOW FONTS WORK. The evolution of font technology has altered the meaning of the word "font" itself.

Originally, a font was a set of characters in a certain typeface (such as Times Roman) in a certain size (such as nine points). These characters were carved onto metal blocks, much as typewriter keys are, and arranged by hand on a press to spell out the text. The characters varied slightly in design among sizes so that each size was optimized for the best appearance. (For example, a large letter would be more detailed than a small one, since details in small sizes would get lost during printing and perhaps obscure the character's readability because of smudging.) Pieces of lead (hence the word "leading" to describe line spacing) were used to space out lines. Even until the 1960s, this was the most common technology.

Then came "cold" type, which used photographic negatives of a font and flashed light through each character on the negative in succession on film paper, which was then processed like a photograph. By varying the distance of the negative to the paper, you could get different point sizes. You no longer needed a separate font for each size, so the word "font" began to mean a typeface in all available sizes. But the difference between sizes began to disappear. Most fonts were available in two versions: text, which tended to be simple for readability at small sizes, and display, meant for headlines and other large-size uses (such

as advertisements) where details aided readability and improved aesthetics.

Then came digital type, which replaced the negatives with a "bit map" — a series of very small dots on a fine grid that the human eye could not discern as separate drops, and therefore looked like continuous characters. TV screens, computer monitors, some laser printers, and all dot-matrix printers use bit maps, although they are much coarser and differently shaped than those common to typesetting machines. Typically, a digital typesetter uses 1,200 dots per inch (dpi). Because these typesetters are software-driven, type foundries (companies that design typefaces) could make the typesetter use different variations of each typeface's bit map to accomplish the fine variations in appearance that type foundries had done in the days of metal type. Rather than store each bit map (which takes lots of space), the typefaces were stored as algorithms — mathematical descriptions of the curves and lines that would draw each character. The typesetter had an interpreter that translated the drawing instructions, called outlines, to the bit map it would output. Printing technology is digital, even when font technology is analog.

Digital type on a desktop came most recently. Adobe Systems created the Postscript language that made digital type a reality, first on the Apple Macintosh and then on any PC. (Like digital typesetters, the outline is translated into a bit map by the printer during printing.) Adobe used the same concept as digital typesetters and a hinting technology in its outlines that optimized the fonts not only for size but for the printer. Thus, the letter "Q" in the Palatino typeface could be produced with slightly different detail on a 300-dpi laser printer than on a 1,200-dpi typesetter, even though only one outline described the letter. Since Adobe encrypted its outlines and kept the technology proprietary, other type foundries, notably Bitstream, could not have their fonts optimized based on the printer.

Instead of using outlines, Hewlett-Packard and other printer vendors used cartridges that stored fonts in certain sizes — similar to the way in which metal type was limited to certain sizes. This fenced in users' choices and split the PC world into two camps: those using modern outline technology that rivaled dedicated digital



This WIN.INI file from Windows 2.11 changes little with Windows 3.0, and includes screen-font entries from Windows, Adobe, Bitstream, and Ami.

typesetters, and those using outdated technology similar to the metal-type machines. With the introduction of the Laserjet III in March, the majority camp using the old technology now has a superb path to outline technology. It includes scalable fonts *without* Postscript and adds a proprietary Resolution Enhancement Technology that significantly smooths characters, fully exploiting their 300-dpi limit.

Although most fonts are described as outlines, screen fonts remain bit maps. Thus, you must install two fonts: one for the screen and one for the printer. Fortunately, most font vendors have installation programs to simplify this task, and you receive either a set of pre-

determined screen font sizes (for example, as provided by Windows and Adobe) or you can create your own set of font sizes (for example, Bitstream).

But the fact that there are two types of fonts for the same character makes true WYSIWYG fonts a rarity. This means that what you see on the screen is *not* what you get, since the application uses the nearest size available and either overspaces or crams the characters on-screen to compensate, or substitutes a default font that it can scale to the correct size (even though the character won't look on-screen like the selected font's character to be printed). You might find yourself buying printer fonts — commonly as much as \$200 a set — just to get

screen fonts, since your printer or service bureau may have several built-in fonts that don't come with Windows or other applications (e.g., Palatino and Avant Garde). You can download screen fonts for free from several bulletin boards. Bitstream's Fontware Installation Kit lets you install screen fonts, and Adobe sells a special screen-font-only installer.

FONTS IN WINDOWS. The interface for loading fonts in Windows 3.0 has not changed substantially from previous versions, although a few niceties have been added. For example, you can now easily access listings of all your loaded fonts and their sizes through the Fonts window, and sample screen fonts are shown for each. In

general, however, the way in which you handle fonts with Windows has not changed substantially.

Windows enforces some standards on fonts, but it leaves much of the work up to the individual applications. This adds both flexibility and confusion.

The infamous WIN.INI configuration file in Windows contains lists of screen and printer fonts and their locations. The fonts section handles screen fonts, and the WIN.INI "softfonts=lines" in each printer/port section handles the printer fonts. The fact that each printer/port combination can have a different list of fonts (one that can also differ from the screen font list) gives great flexibility in configuring applications' font usage.

For example, you may want to use Bitstream printer fonts for proofing on a laser printer but Adobe fonts for the final output to be sent to a service bureau. Or system administrators may want to restrict a user's choice of fonts to enforce design consistency by having different font sets available via different printers or ports.

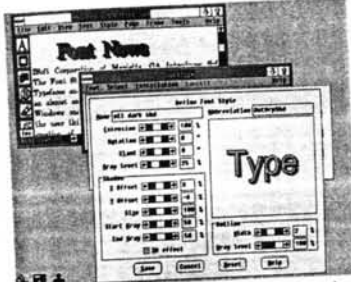
Of course, doing either requires a deep understanding of the intricacies of WIN.INI, the printers' resident fonts, and the applications that use the fonts. According to Diane Cabral, assistant manager of technical support at Bitstream, and Kathy Englar, product marketing manager for the Adobe Type Library, problems with WIN.INI make up the largest segment of technical support calls. Microsoft advises most users to leave WIN.INI alone and let the type foundries' installation programs do the work.

Some applications use their own fonts. For example, Corel Draw features its own elaborate set of outline fonts that you can edit and manipulate in a variety of ways. These fonts only appear in Corel Draw because they only appear in the "Corel-DrawFonts" section of WIN.INI; they are not in the Windows .FON screen-font format and do not have the appropriate .PFM metrics files that would make them usable as a general Windows font.

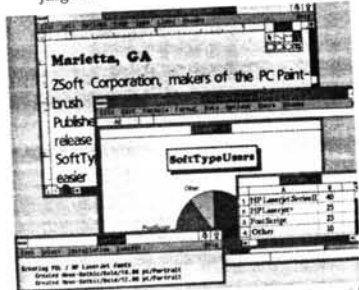
FONT FACTS. Fonts use special metrics files also called width tables, that tell an application each character's relative size

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"Since Windows is a graphical environment, fonts have been a focal point for many applications."

so the application can correctly position characters on-screen and during printing. These files often contain kerning information, which are "override" instructions for certain letter combinations. However, you cannot edit the Windows version of these files. For Postscript fonts you can edit the metrics files, which used by Adobe's and Bitstream's installation packages to create the final font file. Or you can use your application's kern feature, if available, to alter the default values on the fly.

Windows comes with a set of fonts that match common font sets: Times Roman, Courier, Helvetica, Symbol, Modern, and Script. Modern Script are coarse bit-map fonts available only in selected sizes; they are inte-

for simple uses, not for quality documents, Microsoft told us. The other four are close copies of Adobe's Times Roman, Courier, Helvetica, and Symbol. (Symbol is new to Windows 3.0.) When printing Windows Times Roman and Helvetica to a Postscript printer, you'll get the Adobe Times Roman and Helvetica fonts (or, on some printers, Bitstream's Dutch- and Swiss-clone fonts altered to match Adobe's metrics).

You should note that the names of the fonts differ from foundry to foundry because fonts are copyrighted and their names are trademarked, so companies must either license the font or use a slightly different version and a different name. Long before type came to the PC, the standard was to make close copies (often, but not always, with similar names). Typesetters long ago got used to

another. Bitstream and Adobe both have large user bases; Agfa Compugraphic's connection with Hewlett-Packard assures it a continuing role; the new version (2.0) of Type Director uses outline and bit-mapped fonts for all Hewlett-Packard Laserjet, Deskjet, Paintjet, and other non-HP and non-Postscript printers.

Printer fonts are generated on the fly, but you have to generate screen fonts in various sizes manually; a version called Bullett is also available for applications developers.

Microsoft is uncertain how to position True Type in Windows. It is unsure currently whether to make True Type a part of a future version of Windows or to make it a dynamic linked library (like

Speedo, Type Manager, and Type Director) that applications use behind the scenes as needed. It may even be marketed as a separate program. Bitstream's Speedo is available for applications developers for use within applications, although only a few products — such as SPC's First Publisher — currently support it. Speedo generates screen and printer fonts on the fly; for applications that don't use it, screen fonts can be generated manually as can printer fonts for non-Postscript printers.

If these type managers' algorithms and underlying technologies are kept in the public domain as available standards or through technology licenses, applications developers will be able to build interpret-

ers to handle all of them or to convert the outlines into editable graphics. The result of this would be massive type libraries represented by Adobe, Agfa Compugraphics, and Bitstream. Users could then edit and manipulate the type using applications such as Aldus' Pagemaker and Corel Draw (which currently can only edit its own simple fonts). This would open up sophisticated font-manipulation capabilities. □

Galen Gruman has set up an electronic publishing system for a bimonthly trade magazine and a quarterly national association newsletter. He has evaluated MS-DOS desktop publishing and graphics programs for several years.

"True Type technology promises faster printing across a range of printers and platforms."

equating names like Helvetica, Helios, and Swiss; personal computer users are just starting.)

You can accidentally confuse the font metrics if you add new fonts from the Fonts application under the Control Panel. This option can create a font metrics file that will not match the printer's, causing awkward spacing and positioning.

This problem usually occurs when installing a font from Windows because the installation alters WIN.INI, but Windows or the Windows application does not always note the change and you may have to restart Windows, according to Bitstream. Users looking for the added font may try Add New Fonts instead of restarting Windows. Using this option to install a font already installed can cause the difference in metrics, Bitstream said. Microsoft advises people to use the installation kits and avoid this menu option, and in Windows 3.0 it is available from the printer dialog box.

The accompanying Remove Fonts option in Windows is handy for getting rid of fonts you don't use, either because of design decisions or because they aren't available on your printer (like Helvetica Narrow, which is not supported by several typesetters).

WHERE THE TECHNOLOGY IS MOVING. For printer fonts, the proposed True Type font technology simplifies the algorithms and expands the range of hinting techniques for outline fonts, promising faster printing across a range of printers and platforms. It is currently unclear when this implementation will be available; when it is available, it will most likely run as part of Windows or as an add-on, according to Microsoft. True Type, Type Director, Speedo, and Type Manager all promise to generate screen fonts on the fly from the same outlines that generate the printer fonts, so what you see on the screen actually matches what you see from the printer.

For a while, at least, these type managers may have to reside on your system together because some applications use one technology and others use

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