Bitmap, PostScript, and TrueType Fonts Compared (7/96)

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TOPIC ---

This article compares bitmap, PostScript, and TrueType fonts as System 7 uses them. This article also explains the basics of font terminology and mechanics and answers some of the most frequently asked font questions.

You can mix all three types of fonts in the same document.

DISCUSSION ---

Bitmap, TrueType, and PostScript Fonts

Suitcases can contain only bitmap and TrueType fonts; PostScript printer fonts are separate files. So a suitcase could contain just bitmap fonts, bitmap fonts and a corresponding TrueType font, or bitmap fonts that correspond to a separate PostScript printer font.

Bitmap Font

Bitmap fonts (also called fixed-size) is a representation of a certain font in an exact size. Bitmap fonts have the single letter "A" shown on their icons. You need a separate font file for each size of character you want to use.

These fonts consist of "pictures" of a typeface at specific sizes. For example, you might have bitmap fonts at 10, 12, and 18 point sizes installed in your Macintosh computer. “Times 12” is each character of the Times font at exactly 12 point.

If you try to use sizes that aren't installed, the Macintosh scales the largest installed bitmap, often resulting in type that is blocky and less legible. Specifically installed bitmap font sizes look smooth on any screen and print smoothly on PostScript printers.

PostScript Font

PostScript is an industry-standard page-description language used for describing

text, graphics, and digitized images for printed pages. This font has two parts to it; a bitmap font that the Macintosh uses like any other bitmap font, and a printer font used only by PostScript printers and Adobe Type manager software. All PostScript printer fonts have corresponding bitmaps; without them, your font does not appear in the Font menu of your applications. Like TrueType, PostScript printer fonts are a scalable outline. However, they require Adobe Type Manager (ATM) software to display without “jaggies” or print smoothly on a non-PostScript printer. The LaserWriter driver converts fonts to mathematical formulas instead of bitmapped images.

PostScript uses outline font technology to describe characters as a number of PostScript or B-spline curves. These curves are stored as mathematical constructs that form the outline of a character. The print controller processes the constructs to arrive at the desired size, style, and orientation, and then fills in the object with dots at the specific resolution of the printing device.

Several Apple LaserWriter printers support PostScript. PostScript fonts are also used in combination with bitmap fonts to support additional fonts on the Macintosh.

To use PostScript fonts with system software version 7.1, install bitmap and PostScript fonts in the Fonts folder. You can drag fonts or font suitcases to the closed System Folder, and the system will ask if you want to place them in the Fonts folder. Click the OK button.

In system software versions 7.0 or 7.0.1, install bitmap fonts by dragging a font suitcase or font file onto the closed System file. Put PostScript fonts in the Extensions folder.

For versions of System 6, use Font/DA Mover to install bitmap fonts into the System file and put PostScript files into the System Folder.

TrueType Font

TrueType (also called variable-size, outline, or scalable) fonts describe a typeface without rigidly specifying a size, and thus look good whichever size you choose. A TrueType font is a representation of a certain font defined by a scalable outline. Your Macintosh uses this outline to generate the size of the font you require. TrueType fonts provide sharp text at any size on any device, whether screen or printer. The TrueType font format is an open-industry standard, so you can mix and match TrueType fonts from various font vendors.

TrueType fonts are mathematical descriptions of text characters that store individual characters as a series of lines and curves, rather than a group of pixels (a bitmap). When an application asks for a character in any size, like 33 point, the Macintosh enlarges this outline to 33 point and fills in the dots for the display or printer output.

Only Macintosh computers running system 6.0.7 or later versions support TrueType fonts. To use TrueType fonts with System 6, be sure you have at least 1MB of RAM, install version 6.0.7 or later, and install the TrueType INIT. Install the

fonts using Font/DA Mover version 4.1.

Versions of System 7 don't require the TrueType INIT nor the Font/DA Mover. Drag TrueType fonts onto the closed System file, and system software version 7.1 places fonts in the Fonts folder. TrueType is fully compatible with all Macintosh hardware. As part of the operating system of the Macintosh, it's transparent to the user, making it easier to use and to manage fonts.

TrueType prints on most devices, including PostScript devices. Very little has changed about printing in versions of System 7. Apple provides a TrueType core set that maps to the internal fonts in printer ROM, as they did in System 6. When you print a page with a third-party TrueType font on it, the LaserWriter driver sends the TrueType font and the TrueType scaling software to the printer. This ensures the best match to the screen display, because the printer uses the same font and scaling software.

Low-cost, non-PostScript printers (like the Personal LaserWriter LS, StyleWriter, HP DeskWriter, and so on), used with a Macintosh computer, can produce excellent type quality with System 7 and TrueType fonts. Also, direct-connect printers, driven by QuickDraw and TrueType, print with good type quality.

You can recognize TrueType fonts by these characteristics:

- Multiple letters on the icon — TrueType fonts have a scaling "A" shown on their icons.

- There's no point size in the name.

Using TrueType with PostScript

PostScript is a page-description language, and TrueType is a font technology. They aren't interchangeable. However, if a file requires a PostScript font not available in LaserWriter ROM nor in the System Folder, PostScript can use the available TrueType font to print. Using the TrueType font requires additional processing, and can reduce LaserWriter efficiency.

TrueType fonts don't necessarily take more disk space than PostScript Type 1 fonts. People sometimes look at the size of the downloadable Type 1 font and compare that to the size of the TrueType font. This isn't an accurate comparison, because a raw Type 1 font doesn't work on the Macintosh without the bitmap fonts and metrics contained in the screen font "suitcase". When the suitcase is added to the equation, PostScript fonts and TrueType fonts typically occupy about the same space.

TrueType fonts have the potential to become larger in point size than PostScript Type 1 fonts, due to the enhanced functionality offered by the technology. Many high-quality headline typefaces aren't offered in PostScript form, because of limitations in the Type 1 technology -- like the number of points or contours in a character.

The core set of TrueType fonts (Times, Helvetica, Courier, Symbol, Avant Garde,

Bookman, New Century Schoolbook, Palatino, Zapf Chancery, and Zapf Dingbats) have the same metrics as the fonts in the PostScript LaserWriters that Apple ships.

Using TrueType with Bitmap

Bitmap screen fonts come installed with TrueType fonts on systems using System 7 to maintain compatibility with documents created on Macintosh systems that don't have TrueType fonts. If a document uses a font family and size that's available as both a TrueType font and a bitmap font, the Font Manager uses the bitmap font when the application opens the document. If you want the Macintosh to use the TrueType font, you need to remove the bitmap font from your system.

For example, if a document uses Times 12, available in that size as a bitmap and as a TrueType font, the system uses bitmap. If a document uses Times 4, the system scales the TrueType font to that size because a bitmap version isn't available.

Using only TrueType fonts produces a closer match between appearance of type on the screen and when printed. However, any existing documents you've created with the bitmap fonts will be reformatted with the TrueType fonts, and line breaks in these documents may change. A document created on a system that has TrueType or the Adobe Type Manager installed will have different spacing, kerning, and so on, when opened on a system that doesn't have TrueType or the Adobe Type Manager.

What You Should Use

You can use both TrueType and PostScript fonts at the same time. You don’t, however, want to have both versions of the same font. Helvetica, for example, is available in both TrueType and PostScript, so you should decide on one to avoid needless duplication. This table shows what you can expect depending on what kind of font and what kind of printer you have:

Font Type	Screen	Non-PostScript Printer	PostScript Printer
TrueType	Smooth	Smooth	Smooth
PostScript without ATM	Jagged	Jagged	Smooth
PostScript with ATM	Smooth	Smooth	Smooth

How the Macintosh Displays Fonts on the Screen

These are the steps your Macintosh goes through to display your request on screen:

STEP	ACTION

1	The System Software checks to see if there is a bitmap of the font you want in the exact point size you requested; if found it displays it.
2	If the requested point size is not present, it looks for the TrueType version of the font, which is used to generate the requested point size and then displayed.
3	If the TrueType version of the font is not present, the System Software scales the largest point size available to the requested size and displays it. This is when you see the “jaggies” on your screen.
4	However, if Adobe Type Manager is present, it steps in. If the PostScript printer file of the requested font is also present, Adobe Type Manager generates the requested point size and then pass it on to the System Software to be displayed.

The 128 Font Limit

Only font files and suitcases count towards the 128 limit. Printer files do not, as they are not resources loaded by the System. Drag any loose font files onto a suitcase and/or combine suitcases by dragging them on top of each other. If you want to make an empty suitcase, simply duplicate any suitcase, open it, and throw away the contents.

Font Corruption

Sometimes a font can become corrupted. The most obvious symptom of this is that it cannot be removed or causes your Macintosh to crash when you choose it. In System 7.0 or 7.1 you can check for font corruption by double-clicking on a suitcase or font file. An error message stating that it cannot be opened means you need to replace that suitcase or font from your original disks. In System 7.1, if you get an error message trying to pull a font or suitcase out of the Fonts folder, first make sure you have quit all running applications. Then, drag the Fonts folder out of the System Folder onto the Desktop. You should now be able to remove corrupt font or suitcase. When you’re finished, put the Fonts folder back in the System Folder.

Just Drag and Drop

Most font-related problems come from missing pieces; a quick check to make sure everything is installed properly usually results in a quick fix. In System 7 and above, the easiest way to make sure the different components wind up in the right place is to simply drag each item on top of the System Folder icon; the System places things where they need to be for you. Remember not to drag a folder on top of the System Folder; the items inside are not moved to where they need to be.

Viewing Your Fonts

To see what fonts you have installed:

- For versions of System 6, use the Font/DA Mover.
- For versions of System 7 before 7.1, double-click the System file to open it as you would any other file.
- For system software version 7.1, open the Fonts folder within the System Folder.

If you have a version of System 7, you can see samples of the fonts. Double-click the font file, and a window appears displaying the font.

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