



Adobe® PostScript®

PostScript® 3™ Core Font Set Overview

Adobe Developer Support

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Adobe Systems Incorporated

Corporate Headquarters
345 Park Avenue
San Jose, CA 95110-2704
(408) 536-6000

Eastern Regional Office
24 New England
Executive Park
Burlington, MA 01803
(617) 273-2120

Adobe Systems Europe Limited
Adobe House, Mid New Cultins
Edinburgh EH11 4DU
Scotland, United Kingdom
+44-131-453-221

Adobe Systems Japan
Yebisu Garden Place Tower
4-20-3 Ebisu, Shibuya-ku
Tokyo 150 Japan
+81-3-5423-8100

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PostScript 3 Core Font Set Overview

1 Introduction

Adobe PostScript® 3™ products introduce a number of enhancements to font handling for the PostScript language and to the core font set. This document discusses the new core font set of 136 fonts and the extension of the character set introduced to support the Adobe Central European (CE) character set. The changes to the PostScript language, a list of all core fonts, and a description of the new character sets and encodings are specified in the *Supplement: PostScript Language Reference Manual (LanguageLevel 3 Specification and Adobe PostScript 3 Version 3010 Product Supplement)*.

The changes to the PostScript language, core font set, and character sets offer the potential for improved printing performance, as well as other benefits for developers who wish to take advantage of the new features. The majority of the changes do not require developers to update existing software; a few changes offer the potential for extra benefits if the developer wishes to take advantage of them.

Note: One change that may affect all applications that query the Windows® or Macintosh system for a list of fonts is that all fonts with CE character sets have either two FOND resources (for Macintosh), or two PFM files (for Windows). This means the application will get two font names returned for each font name that has a CE character set. For example, the Courier font will show up as both “Courier” and “CourierCE” in the list returned, as well as in the user’s font menu. These CE font names are listed in Appendix E of the Supplement: PostScript Language Reference Manual (LanguageLevel 3 Specification and Adobe PostScript 3 Version 3010 Product Supplement).

2 The PostScript 3 Core Font Set

The new core font set consists of 136 fonts:

- the standard 35 fonts

- fonts to support the core fonts in Windows 95, Windows NT[®], and Macintosh
- selected fonts from Microsoft[®] Office and the HP 110 font set

The remaining fonts in the core set were added to provide a well rounded variety of display and text fonts.

The benefit of this larger core set is that printing performance will improve because frequently used fonts will not need to be downloaded to the printer.

2.1 Core Font Formats: Addressing Multiple Markets

Adobe's strategy is to provide a wide range of fonts, and to make them available in several degrees of compactness. This allows Adobe's printer OEMs to add value to their products in a manner that most suits the needs of their market. The differences in the font formats are transparent to the application or printer driver; all are selected and used in the normal manner.

The highest quality fonts are needed for the graphic arts and publishing markets, which is where the Compact Font Format (CFF) will be used for printer-resident fonts. CFF offers a significant amount of font file size reduction (compared to Type 1 fonts), while retaining the highest quality of the best Type 1 fonts. The storage savings achieved by CFF fonts is not due to compression; rather it is a more efficient format, uses a more compact form of encoding commands and numbers, and

For the office and enterprise markets, where price is a bigger issue than typographic quality, the Adobe Chameleon[®] technology is used to improve file compression for the majority of the core fonts. The core set of 136 fonts (including extended CE character sets) can be stored in a minimal amount of ROM, thus reducing costs. One side effect of this significant savings is that it is more difficult to achieve fidelity to the original typeface designs, and the hinting (information in the font that helps the quality of rendering at low resolutions) is not as effective (compared to equivalent Type 1 fonts) at lower resolutions. The host versions of the core fonts always use the original Type 1 or TrueType versions, so optimal quality is always provided for display on the screen.

3 Host Support for Core Fonts

The 136 core fonts resident in printer ROMs will be provided by the printer vendor in either the Type 1 or TrueType font format. These fonts on the host are metrically compatible with the fonts in the printer, regardless of the format of the printer fonts. It is not expected that the Chameleon technology will be used for host fonts in the future.

New releases of the AdobePS™ printer driver (version 4.2 for Windows and version 8.6 for Macintosh) support the additional fonts and extended character sets.

4 Core Font Set Formats

PostScript 3 core fonts are represented in three different font formats, as explained in the following sections.

The Chameleon Font Format

The Chameleon font format is used to represent a large number of fonts in a small amount of storage space. The core set of Chameleon fonts consists of one Master Font, and a set of font descriptors that specify how the Master Font is to be adjusted to give the desired set of character shapes for a specific typeface.

Because there is limit as to the complexity of shapes that can be represented in a single Master Font, the Chameleon format is used for only 112 of the 136 fonts. The format is undocumented; however Chameleon fonts are accessed in the usual way, as font resources, using the PostScript language. Chameleon fonts are used only in printer ROMs, where they are represented as Type 14 fonts. Type 1 and TrueType versions of the fonts will be used on host systems.

CFF Fonts

CFF is similar to the Type 1 format, but it requires only about 50% to 60% of the storage space. While the space savings are not as great as with Chameleon fonts, the format is a totally lossless method for compactly representing fonts. It is not really a compression method, since no decompression is needed; CFF fonts are directly interpreted by the PostScript 3, which also aids performance. Type 1 fonts can be converted to CFF, and back again, and they will yield the exact same

bitmaps when rasterized by Adobe Type Manager® (ATM®) software. The CFF specification is described in Adobe Technical Note #5176, *The Compact Font Format Specification*.

CFF is really a file structure format that uses a binary data structure to replace the PostScript font dictionary of a Type 1 font. This data structure may contain character descriptions (charstrings) of various formats, but it was designed to work best with Type 2 charstrings (see Adobe Technical Note #5177, *The Type 2 Charstring Format*, for more information). This format is also used for font embedding for Adobe Acrobat® 3.0 products, and it will be the basis for the Type 1 versions of the new OpenType™ font format.

CFF fonts achieve their compactness through the use of extended functionality operators, more efficient encoding of commands and numbers, the use of default values for many font entries, and the ability to share elements and subroutines across font families. Fonts can be grouped into a **FontSet**, which becomes a PostScript language font resource. The fonts contained in all Chameleon and CFF **FontSet** resources also appear as instances of the **Font** resource category, which makes them individually accessible via the normal LanguageLevel 2 font resource operators, such as **findfont**, **findresource**, and **resourceforall**.

TrueType/Type 42

A number of fonts in the core font set are TrueType fonts, which were included because they are commonly used in Windows or Macintosh systems. Because fonts are provided in the printer, the user will experience increased performance and ease of use when printing to PostScript printers.

A Type 42 font consists of a TrueType font with a PostScript language wrapper (that is, a font dictionary). The Type 42 format is specified in Adobe Technical Note #5012, *The Type 42 Font Format Specification*.

TrueType fonts are represented in two formats: on the host they are in TrueType format, and in printers they are represented as CFF or Chameleon fonts, depending on the printer and intended market.

Table 1 shows a typical font configuration for a printer targeted for the office market. Fonts that are typically in TrueType format on the host, such as those supplied with Windows and Macintosh systems, are represented in the printer as either CFF or Chameleon fonts. In a printer targeted for the graphic arts market, those same fonts would be represented in both the printer as Type 42 fonts (a TrueType font with a PostScript wrapper), and as a TrueType font on the host.

TABLE 1 Potential Font Configuration for Office Market Printers

| LOCATION | FONT FORMAT | NUMBER OF FONTS |
|----------|-------------|-----------------|
| Printer: | CFF | 24 |
| | Chameleon | 112 |
| Host: | Type 1 | 117 |
| | TrueType | 19 |

Table 2 shows a typical font configuration of the printer and host font formats for a graphic arts market printer, where users are more sensitive to typographic quality than to ROM size and cost. All fonts in the printer are likely to be in the CFF/Type 2 format to provide the highest quality.

TABLE 2 Potential Font Configuration for Graphic Arts Market Printers

| LOCATION | FONT FORMAT | NUMBER OF FONTS |
|----------|-------------|-----------------|
| Printer: | CFF | 117 |
| | TrueType | 19 |
| Host: | Type 1 | 117 |
| | TrueType | 19 |

Core Font Character Sets

Of the 136 fonts in the core font set, 112 (that is, those in the Chameleon format) have the CE character sets and encodings. For the first release of host fonts, only 55 of the Type 1 and TrueType fonts will have CE character sets.

This CE character set adds support for a number of additional languages, including Baltic, Turkish, Czech, Hungarian, and Polish. The CE character set totals 253 characters; the union of this set with the standard character set yields a total of 315 characters. Currently, those characters are only accessible by users on a Macintosh GX system, or in Windows with a localized language version of the system.

Table 3 shows the breakdown of character sets and font formats for the core font set for use on the host. Fonts that have a character set of 315 glyphs are those that support the CE character set.

TABLE 3 Core Font Character Sets for use on Host Computer

| FONT TYPE | NUMBER OF FONTS | CHARACTER SET |
|-------------------|--|---------------|
| Type 1 (symbol) | 3 (Carta®, Symbol, Zapf Dingbats) | < unique > |
| Type 1 (text) | 112 | 229 |
| Type 1 (text) | 2 (Apple Chancery, Coronet™) | 315 |
| TrueType (symbol) | 2 (Microsoft Wingdings®, Apple Hoefler Text Ornaments) | < unique > |
| TrueType (text) | 17 | 315 |

The character sets and encodings for the new fonts are shown in Appendix E of the *Supplement: PostScript Language Reference Manual*. That appendix also shows the new character added to the Symbol font, the European currency symbol, which is encoded at position 240 (decimal) in the font's encoding vector.