

# Embedding Fonts with TeXShop

Richard Koch

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*Question:* Do you know if all fonts are embedded in the pdf files produced by TeXShop, both with pdflatex and with TeX & Ghostscript?

*Answer:* I'm not an expert on this subject, so I had to do some research.

## 1 Preliminaries

This is really a question about your T<sub>E</sub>X distribution rather than TeXShop. When TeXShop typesets a file, say `myfile.tex`, with pdflatex, it simply calls

```
pdflatex myfile.tex
```

and displays the resulting `myfile.pdf`. When it typesets the same file with T<sub>E</sub>X & Ghostscript, it calls

```
simpdftex latex myfile.tex
```

and displays the resulting pdf file. Thus the real answer to the question depends on how the program pdflatex is configured, and how the script simpdftex and the various programs that it calls — latex, dvips, ps2pdf13 — are configured.

Nevertheless, I believe these configurations are the same for all recent T<sub>E</sub>X distributions: TeX Live 2007, gwTeX, and BasicTeX. So let me restrict attention to TeX Live 2007. I'm going to do some experiments designed to reveal the answer.

## 2 More Background

The question is really about the 35 postscript fonts which are in Apple's Laserwriter and subsequent postscript printers. Since postscript files are often destined to be printed, it is not necessary to include the 35 fonts already in the printer, although any other font must

embedded in the postscript or pdf file. Often only the subset of characters actually used in the document is placed in the pdf file.

However, in the modern world where pdf files are exchanged rather than printed, it can be crucial to embed all fonts.

It is useful to know something about the public domain replacements for the Adobe Fonts. Quoting the document *Free Math Font Survey* by Stephen G. Hartke, available on CTAN, we read

When Adobe introduced Postscript in 1984, they defined 35 core fonts (in 10 typefaces) that must be present in all Postscript interpreters. In 1996, URW++ released a replacement set for the core fonts under the GNU General Public License. The URW++ fonts were primarily released for use with Ghostscript, a free Postscript interpreter. The table below lists the original Postscript fonts, along with the URW++/Ghostscript equivalents. Each font can be used as the default text font by selecting the indicated LaTeX package from the PSNFSS distribution.

Adobe Postscript	URW++/Ghostscript	# of fonts	package
Avant Garde	URW Gothic L	4	avant
Bookman	URW Bookman L	4	bookman
Courier	Nimbus Mono L	4	courier
Helvetica	Nimbus Sans L	8	helvet
New Century Schoolbook	Century Schoolbook L	4	newcent
Palatino	URW Palladio L	4	palatino
Symbol	Standard Symbols L	1	
Times	Nimbus Roman No. 9 L	4	times
Zapf Chancery	URW Chancery L	1	chancery
Zapf Dingbats	Dingbats	1	

### 3 Producing a Test Document

Below is a test package which accesses some of these fonts, and the resulting output. We will call this file `NewSample.tex`.

```

\documentclass[11pt]{article}
\usepackage{geometry}
\geometry{letterpaper}
\usepackage[parfill]{parskip}
\usepackage{graphicx}
\usepackage{amssymb}
\usepackage{epstopdf}
\DeclareGraphicsRule{.tif}{png}{.png}{'convert #1 'dirname #1'/'basename #1 .tif'.png}

\title{Font Sample}
\author{Richard Koch}

\begin{document}
\maketitle

We are going to try a series of standard Laserwriter fonts.

\fontfamily{ptm} \selectfont
This is an example of Adobe Times Roman.

\fontfamily{phv} \selectfont
This is an example of Adobe Helvetica.

\fontfamily{pcr} \selectfont
This is an example of Adobe Courier.

\fontfamily{ppl} \selectfont
This is an example of Adobe Palantino.

\fontfamily{pzc} \selectfont
This is an example of Zapfino.

\fontfamily{pnc} \selectfont
This is an example of New Century Schoolbook.

\fontfamily{pbk} \selectfont
This is an example of Bookman.

\end{document}

```

# Font Sample

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We are going to try a series of standard Laserwriter fonts.

This is an example of Adobe Times Roman.

This is an example of Adobe Helvetica.

This is an example of Adobe Courier.

This is an example of Adobe Palantino.

*This is an example of Zapfino.*

This is an example of New Century Schoolbook.

This is an example of Bookman.

## 4 Testing for Embedded Fonts

Let us first typeset the sample with pdftex. We want to see if the resulting pdf file has embedded fonts. To this end, we open the file `NewSample.pdf` in Adobe Reader 8.1.0, and then select “Properties” in the “File” menu and examine the list of fonts under the “Fonts” tab in the resulting panel. Each listed font name is immediately followed with the text “(Embedded Subset)”. We conclude that pdftex embeds these fonts.

The list of fonts given by Adobe Reader is interesting. The list contains three standard Computer Modern TeX fonts: `CRM10`, `CMR12`, and `CMR17`. It also contains URW++ substitutes for Adobe fonts: `CenturySchL`, `NimbusMonL`, `NimbusRomNo9L`, `NimbusSanL`, `URWBookmanL`, `URWChanceryL`, and `URWPalladioL`. All of this makes perfect sense, since if pdftex is going to embed fonts, it must use the URW++ substitutes.

Next let us typeset with TeX & Ghostscript and open again in Adobe Reader. This time we see that the TeX fonts are still embedded, but the Adobe fonts aren’t.

The embedded TeX fonts are still `CMR10`, `CMR12`, and `CMR17`. But the actual Adobe font names are listed this time, since TeX does not need to embed substitutes: `Bookman-Light`, `Courier`, `Helvetica`, `NewCenturySchlbk`, `Palatino`, `Times`, and `ZapfChancery`.

## 5 Forcing TeX & Ghostscript to Embed Fonts

If we examine the file `updmap.cnf` in `/usr/local/texlive/2007/texmf-var/web2c`, we find a series of important font configuration lines. The first tells dvips to prefer outline fonts over bitmap fonts, the second tells dvips to use the URW fonts with “berry” filenames for the basic 35 Laserwriter fonts, and the third tells dvips not to download the 35 base fonts. I suspect that by changing this third line from “false” to “true” we could configure dvips to embed these 35 fonts. But I am too lazy to try because I have another method.

It turns that there is a flag which can be set when calling dvips, telling it to embed fonts:

```
-Pdownload35
```

We can force the script `simpdftex` to call dvips with this flag by changing one TeXShop preference. In TeXShop Preferences under the Engine tab, in the second column under “Latex Program” change the line

```
simpdftex latex --maxpfb
```

to

```
simpdftex latex --maxpfb --extradvipsopts "-Pdownload35"
```

Repeating the test with `NewSample.pdf` at the start of this paragraph, typesetting in TeX & Ghostscript mode, we find that all fonts are now embedded. Done!

## 6 A Warning

There still may be problems if you use illustrations. Some preliminary experiments suggest that if you start with an eps file constructed with a program which does not embed Laserwriter fonts in its output, and add this eps illustration to your TeX document, then the required fonts for the illustration will not be embedded even though fonts required in the text are embedded. This problem probably also affects pdf illustrations.

I haven't pushed these experiments very far. To solve the problem, it may be necessary to convince your graphic program to embed fonts when it saves.