Makefont: a new 4TEX utility

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Abstract

The second release of the 4allTEX CD-ROM comes with 4TEX 3.25. This version of 4TEX has a new utility that is not described in the manual. In this note I will explain the use of this extra feature: *Makefont*. With the `makefont` utility it becomes easy to include whatever PostScript font you need into your (LA)TEX documents. If you have a complete font family of PostScript fonts you can also decide to develop your own style file and use this as your default font family (instead of the CMR family).

1 Introduction

The need to include a PostScript font into my documents comes from the fact that our institute uses the Frutiger font for all our reports and papers. This PostScript font can be used within WordPerfect (only in combination with a PostScript printer) and that challenged me to make it also available for TEX(on any printer).

Before you can use a PostScript font within TEX documents you need several utilities to convert the PostScript font into all kinds of other files (`.vf`, `.tfm` and `.pk`). For a good explanation of PostScript fonts I refer to the article of Phons Bloemen (included in this MAPS).

To include a PostScript font you need the `.afm` file and a `.pfb` or `.pfa` file. The `.afm` (Adobe font metric) can be more or less explained as the PostScript counterpart of the `.tfm` file within TEX. I.e. it contains the information about the sizes of the characters. The `.pfb` or `.pfa` file can be seen as the PostScript versions of a `.mf` file METAFONT uses. The difference between a `.pfb` and a `.pfa` file is that the first one is a binary file and the second one is an ASCII file. In this note I will use the Frutiger font as an example (i.e. `ftli___.afm` and `ftli___.pfb`).

If you do not have an `.afm` but only a `.pfm` (i.e. this file is used within MS-Windows) you can convert the `.pfm` into an `.afm` with the utility `pfm2afm.exe`. This utility can of course be found on the 4allTEX CD-ROM directory `d:\emtex\utility`.[1] Note, however that not all the information contained in the `.afm` is also available in the `.pfm`, so there may be some loss in quality.

2 Makefont utility

In this section I will not try and explain all the technical details but only will describe what is to be done before we have converted a PS font for use within TEX.

The first thing that should be done is to convert the `.afm` file into a `.tfm` file. This is done by the utility `afm2tfm.exe`. As a result of differences between font encodings we also need a virtual font. The virtual font is generated by the programs `vptovpl.exe` and `vptovf.exe`. When we want to view or print the font a bitmap needs to be generated (i.e. a `.pk` file). This `.pk` can be generated by using the `ps2pk.exe` program.

When 4TEX misses a font it will check if it is a PostScript font or a Metafont font. When it is a `.ps` font it will call `ps2pk.exe` to generate a bitmap from the PS font. When it is a `.mf` font it will call Metafont to generate the missing font. The user doesn't need to bother, after the detection of a missing font, 4TEX will check a file called `c:\texfiles\4system\psfonts.inf`[2] if it is a PS font. If you want bitmaps of PS fonts you need to add the PS fonts to this file. If you want to use the PostScript font with `dvips` to print on a PS printer, then you need to add this font to the `c:\texfiles\4system\psfonts.map` file. If you want to use the PS font with Ghostscript you need to update the file `c:\texfiles\4system\fontmap`. Of course all these files are updated anatomically within the `makefont` utility.

In figure 1 we can see the 4TEX menu after choosing the `makefont` utility (i.e. the utility option in the main menu). First you need to select a PS font you want to convert. This is done by pressing the F. You can type the font name

[1] Assuming that the CD-rom drive is called `d:`

[2] Assuming that the 4allTEX CD-ROM installation is done on the `c:` drive

or use the wildcard options as anywhere else in the 4TEX workbench. You can select from all the `.afm` files that are stored in the directory specified by the environment variable `%MYPSFONTS`. This variable is stored in the file `c:\texfiles\4system\texuser.set`.

By pressing the E you can select one of the following three encoding:

- No font encoding: use Adobe encoding
- old NFSS v.1 encoding
- new NFSS v.2 (Cork) encoding

The default encoding is the old NFSS v.1 encoding (see also Phons Bloemens article in this MAPS).

The letter T will allow you to select one of the following transformations:

- Raw (no transformation)
- Caps-small caps
- Oblique
- Narrow.

The default transformation is Raw (no transformation). The type of transformations as well as the use of fonts are clearly explained in the 'LATEXcompanion'.

By pressing S you can edit the font-setting files: `ps-fonts.map`, `psfonts.inf`, and `fontmap`.

After selecting the font, the encoding and the type of transformation you now can convert the PS font for use within TEX, simply by pressing the C. Because not all the PS fonts follow Karl Berry's font naming rules, I decided to take the first 5 letters of the PS font and the last character of the font name to make the (LA)TEX font. For example the PS font `testfont.ps` will result in the TEX font `testft`. After generating the files needed within TEX and updating the font-setting files 4TEX will tell you how to use the font within your document. Converting the font `ftli___.afm` wil result in the following message:

```
The PostScript font ftli__ is now available for
use within TeX. Within LaTeX this is done by
defining the font, e.g.
    \font\ownfontname=ftli__
or
    \font\ownfontname=ftli__ at 12pt
or
    \font\ownfontname=ftli__ scaled \magstep2

The font is activated e.g. by the command
    {\ownfontname This is a test}.

When using NFSS v1 just look at the file
    cd:\emtex\latex209\ps\avantgar.sty
and with NFSS v2 look at the file
    cd:\emtex\input2e\psnfss\times.sty
how the new font can be used within NFSS.
```

After converting the font you can view or print the font in a fonttable. As an example I show you the output for the Frutiger Light Italic font in tabel 1.

Although this utility is still expirimental and will probably contain bugs, I think that it is valuable for everyone who would like to use PS fonts in his documents and then print these fonts without having a PS printer.

Happy 4TEX-ing...

```
                    4TEX v3.25

AFM file       : ftli___.afm
Transformation : Raw
Encoding type  : NFFS v.1 encoding


Makefont menu:
--------------------------------
choose Font to convert
Convert font
change Encoding type
choose Transformation
edit font-Setting files
Print fonttable
View fonttable
show Log file fonttable
Return to main menu

make your choice...

                    (c) 4U 1991-1994
```

Figure 1: *The makefont utility*

Test of Frutiger Light Italic on January 22, 1995 at 1813

	'0	*'1*	*'2*	*'3*	*'4*	*'5*	*'6*	*'7*	
	}8	}9	}A	}B	}C	}D	}E	}F	

Table 1: *The Frutiger Light Italic Font*