

Using TrueType fonts with teTeX and dvips

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2001-06-16

Abstract

This document describes how I have managed to use TrueType fonts with teTeX 1.0 under SuSE Linux 6.2. The way described in “Using TrueType fonts with T_EX (L^AT_EX) and pdfT_EX (pdfL^AT_EX)” [[Rak](#)] did work with MiK_TE_X, but I did not manage to use the fonts with teT_EX.

Strictly speaking this document doesn’t describe how to use TrueType fonts with teT_EX but how to convert TrueType fonts to PostScript Type 1 format which can be used with T_EX.

If I have made any errors or if you have a suggestion please mail it to me.

I don’t know if the shown conversion violates any copyrights.

This document can be downloaded from <ftp://ftp.dante.de/tex-archive/info/TrueType/> (PostScript, pdf and html available).

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1 Preparing the conversion

As an example I will show how to convert the font “VAG Rounded BT” which is part of Microsoft Windows 98 (`tt0756m_.TTF`).

First copy the fonts you want to convert into a temporary directory (e.g. a Windows disk is mounted on `/dos/c`):

```
$ mkdir ~/ttf
$ cp /dos/c/windows/fonts/tt0756m_.TTF ~/ttf
```

Then rename the files to a name conforming the fontname scheme by K. Berry [Ber99]. In this case the supplier is “Bitstream” (Filename `b*****.ttf`)¹. The Shortcut for the typeface is “vr” (Filename `*vr*****.ttf`) taken from [Ber99]. The weight is “regular” (Filename `***r*****.ttf`). The variant is omitted because itself and the width are normal. The encoding is set to “8a” which means Adobe standard encoding² (Filename `****8a**.ttf`). Because the width is standard and the font is linearly scaled, these parts of the filename are omitted. Finally the filename results in `bvrr8a.ttf`. Move the original file to this filename:

```
$ mv tt0756m_.TTF bvrr8a.ttf
```

A more detailed description on the naming conventions can be found in [Ber99].

2 Generating the Postscript Type 1 fonts

To convert the TrueType font to Postscript Type 1 format I used the program `ttf2pt1` by Andrew Weeks et al. (<http://ttf2pt1.sourceforge.net/>). Generate the font files `bvrr8a.afm`, `bvrr8a.pfa`, and `bvrr8a.pfb` by using these commands:

```
$ ttf2pt1 -a -e bvrr8a.ttf bvrr8a
$ ttf2pt1 -a -b bvrr8a.ttf bvrr8a
```

The switch `-a` switches the conversion of some ligatures (e.g. fi) on (thanks to Hume Smith for that hint). In one of the last lines of the output the fontname is noted:

```
FontName VAGRoundedBT-Regular
```

Note the name on a sheet of paper—You will need it later again.

The script `ttf2type1` does these conversion automatically for all files with the extension `ttf` in the present working directory. To get the font names you should start it as follows:

```
$ ./ttf2type1 2>&1 | grep FontName
```

¹You can find this out by viewing the file with `less`.

²Maybe the TrueType font is in Windows encoding, but the approach using “8a” worked fine, so I won’t change it.

3 Generating the T_EX related font files

Use “fontinst” by Alan Jeffrey and Rowland McDonnell (<ftp://ftp.tex.ac.uk/tex-archive/fonts/utilities/fontinst>) to generate the files that T_EX needs to use the fonts:

```
$ tex fontinst.sty
* \latinfamily{bvr}{ } \bye
```

If you use fonts with different variants you have to append the letter of the variant to the family name of the font (e.g. VAGRoundedBT_Condensed would be bvr). Now use `pltotf` on every file with the extension `.pl` and `vptovf` on all files with the extension `.vpl`:

```
$ for a in *.pl; do pltotf $a; done
$ for a in *.vpl; do vptovf $a; done
```

Now you may delete all files that are not used anymore:

```
$ rm *.pl *.vpl *.mtx
```

The manual of the fontinst package includes a better description.

4 Move the files to the right places

Now all files have to be moved to a position where T_EX can find them. I suggest to put them in the `TEXMFLOCAL` tree. One possibility to get its location is to view the file `texmf.cnf`. You can locate it by using `kpsewhich`:

```
$ kpsewhich texmf.cnf
```

e.g. on SuSE 6.2 and teT_EX 1.0 `texmf.cnf` is located in the directory `/etc/texmf/`. Another possibility to get `TEXMFLOCAL` is to use `kpsexpand`:

```
$ kpsexpand '$TEXMFLOCAL'
```

On my computer the `TEXMFLOCAL` tree starts at `/usr/local/teTeX/share/texmf.local`. The `TEXMFMAIN` tree starts at `/usr/local/teTeX/share/texmf`. In order to have less work I set the shell variable `TMF` to the local T_EX tree by typing:

```
$ export TMF='kpsexpand '$TEXMFLOCAL''
```

The files of each file type are installed in an own directory tree which has this structure:

```
$TMF/fonts/<extension>/<supplier>/<fontname>/
```

In this case:

```
$TMF/fonts/<extension>/bitstream/vagrounded/
```

The extensions are: `tfm`, `vf`, `pfa`, `afm`, and `ttf`. The extension `pfb` is an exception, its files have to be copied to the subdirectory `.../type1/....`. Copy the files by typing:

```
$ for a in tfm vf pfa afm ttf; do
> mkdirhier $TMF/fonts/$a/bitstream/vagrounded;
> mv *.$a $TMF/fonts/$a/bitstream/vagrounded;
> done
$ mkdirhier $TMF/fonts/type1/bitstream/vagrounded;
$ mv *.pfb $TMF/fonts/type1/bitstream/vagrounded;
```

You do not really need to copy the `ttf` and `pfa` files into the directory because `TeX` does not use them. I just did it to save them at a special place where I surely find them, if I need them for other purposes later.

Move the `*.fd` files to the directory `$TMF/tex/latex/psnfss/`:

```
$ mkdirhier $TMF/tex/latex/psnfss
$ mv *.fd $TMF/tex/latex/psnfss
```

5 Make dvips find the new font

There are at least two possibilities to make `dvips` find the new font. The first has a simple installation but its usage is a little bit more complicated and it does not enable `xdvi` to use the font. The second possibility has a more complicated installation and may lead to problems when updating `LaTeX` later. But it enables `xdvi` to use the new fonts.

5.1 Use an additional map file

Create the file `$TMF/dvips/config/config.vagrounded` with these contents:

```
o
p +vagrounded.map
```

Create the file `$TMF/dvips/config/vagrounded.map` with these contents (*Each font definition is in one single line.* So in this example each line starts with `bvrr` and ends with `<bvrr8a.pfb`. The `\` just shows that the line is continued in the next one; it does not appear in the file itself.):

```
bvrr8r VAGRoundedBT-Regular \
      "TeXBase1Encoding ReEncodeFont" <8r.enc <bvrr8a.pfb
```

```

bvrro8r VAGRoundedBT-Regular \
    "0.167 SlantFont TeXBase1Encoding ReEncodeFont" \
    <8r.enc <bvrr8a.pfb

```

The first item is the filename of the TrueType font with “8r” instead of “8a”. The second item is the font name you held in mind, hopefully. The next items are the same all times. The last one is the filename of the TrueType font with the extension `.pfb`. Don’t use the tabulator character in the mapping file because this causes trouble with the `updmap` tool generating the map file for pdfL^AT_EX. Use one single space instead.

In the second line the slanted shape of the font is defined. The `fontinst` package generates slanted, italic and small capital shapes of the font automatically if no special font file is available. To use the generated slanted shape the second line is necessary.

Additional font effects can be reached by using `afm2tfm`. Type

```
$ info afm2tfm
```

and go to the section “Special font effects” (This was a hint of Thomas Henlich (henlich@mmers1.mw.tu-dresden.de)).

Finally type

```
$ texhash
```

to update the T_EX file database.

5.2 Append data to the global map file

This technique was suggested by Nguyễn-Dai Quý (daiquy.nguyen@ulg.ac.be) [[Quý00](#)]. Here again two possibilities are available:

- Copy the file `TEXMFMAIN/dvips/config/psfonts.map` to local directory `$TMF/dvips/config` and append the contents of the mapping file `$TMF/dvips/config/vagrounded.map` to the new file:

```

$ cat /usr/share/texmf/dvips/config/psfonts.map \
    $TMF/dvips/config/vagrounded.map \
    > $TMF/dvips/config/psfonts.map

```

- Use the tool `updmap` that is located in `TEXMFMAIN/dvips/config`. Copy it to `$TMF/dvips/config/localupdmap` and edit it.

Insert the lines

```

#####
# locate the map files of the TEXMFMAIN tree
#####

KPSEMAIN='kpsexpand '$TEXMFMAIN' '
DVIPSCONFIG=$KPSEMAIN/dvips/config

```

before the “Configuration section”. Insert `$DVIPSCONFIG/` at the beginning of every filename ending on `.map` in the file: e.g. `charter.map` expands to `$DVIPSCONFIG/charter.map`. On 2000-04-12 I wrote this change as a suggestion to Thomas Esser. So hopefully this isn’t necessary anymore in one of the next releases of `teTeX`.

Edit the `extra_modules` entry in the file `localupdmap` and add the filename of the new map file (`vagrounded.map`):

```
extra_modules="
vagrounded.map
"
```

As an example you can download my own `localupdmap`. But don’t use my version of this file because the original file of your `teTeX` distribution may be different from mine.

Now, run `localupdmap`:

```
$ cd $TMF/dvips/config
$ ./localupdmap
```

The advantage of this method is the fact that not only the file `psfonts.map` is generated but also the files `psftex.map` and `ps2pk.map`. The file `psftex.map` enables `pdfLATEX` to use your new font. I don’t know yet what `psftex.map` does (please tell it to me).

Finally type

```
$ texhash
```

to update the `TEX` file database.

These solutions have one big problem. When you install a new version of `teTeX` probably the file `TEXMFMAIN/dvips/config/psfonts.map` will change so that your version `$TMF/dvips/config/psfonts.map` will be out of date. Then you will have to redo the procedure of the section.

6 Usage of the new font

To use the new font you simple have to insert

```
\renewcommand{\rmdefault}{bvr}\rmfamily
```

into you `TEX` sourcecode. For example `sample.tex`

```
\documentclass{article}
\begin{document}
\renewcommand{\rmdefault}{bvr}\rmfamily
```

```

\noindent Hello, I am VAG Rounded BT
{\slshape Hello, I am VAG Rounded BT slanted}\\
{\scshape Hello, I am VAG Rounded BT small capitals}\\
\end{document}

```

It is more elegant to create a new style file that switches to your new font. The style file `vagrounded.sty` is an example how this can be done.

```

\ProvidesPackage{vagrounded}
[2000/05/12 VAG-Rounded font as default sf font]
%%
\renewcommand{\sfdefault}{bvr}
%%
\AtEndDocument{\PackageWarningNoLine{vagrounded.sty}%
  {Ensure to use dvips with the option -Pvagrounded}}
%%
\endinput

```

If you have not included the mapping entries to the file `psfonts.map` (section 5) you also have to tell dvips that it should use the font:

```

$ latex sample
$ dvips -Pvagrounded sample

```

This should produce the PostScript file `sample.ps` which looks like figure 1.

Hello, I am VAG Rounded BT
Hello, I am VAG Rounded BT slanted
HELLO, I AM VAG ROUNDED BT SMALL CAPITALS

Figure 1: Sample of the font VAGRounded BT

A To do

Nguyễn-Dai Quý has complained that the fontnames contain the underscore (`_`) instead of the minus (`-`). I have not been able to find out whether this causes problems using the fonts. But I also know that nobody uses fonts with an underscore in the name. So I should find out whether the underscores may cause problems e.g. when including eps files which use these fonts (e.g. from Adobe Illustrator).

B Links

Nguyễn-Dai Quý has written a script that does all or most of the conversion automatically [Quý00]. It is available from <http://iris.ltas.ulg.ac.be/>

viettug/contrib/q/. This script also replaces the underscores by minuses in the fontnames.

Hume Smith has developed a method that does not include the type 1 fonts into the postscript file but tells ghostscript to use the TrueType fonts directly [Smi01]. He says that this approach avoids some problems with some fonts. But these files are not portable anymore because they do not contain the used fonts. His description is available from <http://geocities.com/kwantus/ttf.html>.

C References

- [Ber99] K. Berry. Fontname, March 1999. <ftp://ftp.dante.de/tex-archive/info/fontname/>.
- [Quý00] Nguyễn-Dai Quý. TrueType with teTeX : Quick and Dirty, 2000. <http://iris.ltas.ulg.ac.be/viettug/contrib/q/>.
- [Rak] Damir Rakityansky. Using TrueType with TeX (LaTeX) and pdfTeX (pdfLaTeX). <http://www.radamir.com/tex/ttf-tex.htm>.
- [Smi01] Hume Smith. Kwantus' TTF/teTeX notes, 2001. <http://geocities.com/kwantus/ttf.html>.