

Fonts! Fonts! Fonts!

Bob Tennent

Abstract

Discussion of four new font packages and a revamped font package, with notes on the implementation of the support packages.

1 Introduction

Several new font-support packages (with fonts included) have been installed at CTAN recently and adopted by distributions such as T_EX Live and MiK_TE_X. The primary reason for this outburst is that the Google Web Fonts (GWF) site¹ has provided a focal point for both amateur and professional font developers to distribute liberally-licensed fonts. A second reason is that the freely-available `fontforge`² font editing software and the `lcdftypetools` and `autoinst` packages now provide the tools necessary to provide L^AT_EX support for new modern fonts relatively easily; this technology has also been used to revamp the widely-used `libertine` package, which had been abandoned by its original developer.

This article will discuss the following packages:

- `quattrocento`
- `cabin`
- `librebaskerville`
- `ebgaramond`
- `libertine`

but it should be noted that there are two other important GWF-derived packages: `opensans` (supporting the Open Sans family, designed by Steve Matteson of Monotype Imaging) and `sourcesanspro` (supporting the Source Sans Pro family, designed by Paul D. Hunt of Adobe Systems).

2 Font packages

2.1 Fonts by Pablo Impallari

Pablo Impallari is a young Argentinian typeface designer and font developer. He is a professional but believes in “open-doors” type design, and encourages participation in font development.

2.1.1 Quattrocento and Quattrocento Sans

Impallari describes Quattrocento as a classic, elegant, sober and strong typeface; the wide and open letterforms, and great x-height, make it very legible for body text at small sizes, and the tiny details that only show up at bigger sizes make it also great for display use. Only regular and bold variants are cur-

¹ <http://www.google.com/webfonts>

² <http://fontforge.org/>

QUATTROCENTO

A Classic Roman Typeface

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

QUATTROCENTO SANS

A Classic, Elegant & Sober Typeface

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

rently available; for now, the `quattrocento` package activates artificially slanted variants.

Quattrocento Sans is described as warm, readable and not intrusive; it is said to be the perfect sans-serif companion for Quattrocento. It is the main body font at Impallari’s own website.³ Quattrocento Sans currently has regular, bold, italic and bold-italic variants. The `quattrocento` package activates both of the Quattrocento families by default, but options allow selecting just one of them.

2.1.2 Cabin and Cabin Condensed

CABIN

A Humanist Sans with a Touch of Modernism

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

Impallari describes Cabin as a humanist sans inspired by Edward Johnston’s and Eric Gill’s typefaces, with a touch of modernism; it incorporates modern proportions, optical adjustments, and some elements of the geometric sans.

Cabin currently has four weights (regular, bold, medium, and semibold) and designed italic variants of all of these; furthermore there are four condensed variants. All of these have designed small capitals.

2.1.3 Libre Baskerville

Libre Baskerville is apparently based on 1941 specimens produced by the American Type Founders Company, but has a taller x height, wider counters and minor contrast to allow it to work at small sizes on any screen.

There is a designed italic and a bold, but currently there is no bold-italic variant; an artificially

³ <http://www.impallari.com>

LIBRE BASKERVILLE

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

slanted version of the bold variant is substituted by the `librebaskerville` package.

2.2 Egenolff-Berner Garamond

EGENOLFF-BERNER GARAMOND

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

Georg Duffner is a Viennese graduate student of Romance philology. He has begun a project⁴ of digitizing fonts by Claude Garamond and Robert Granjon on a famous type specimen⁵ issued in 1592 by the Egenolff-Berner foundry in Frankfurt. At present, only regular and italic variants are available, but they include designed small-caps and old-style figures, both tabular and proportional. Also, some swash italics and decorative initials are available.

2.3 Linux Libertine and Biolinum

LINUX LIBERTINE

LOREM IPSUM DOLOR SIT AMET, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque.

LINUX BIOLINUM

Iam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa.

These families of fonts are designed by Philipp H. Poll,⁶ and include regular, italic, bold, and semibold variants of Linux Libertine, including small-caps and old-style figures; regular, bold and italic variants of Linux Biolinum (a compatible sans-serif family), also including small-caps and old-style figures; plus a monospaced font, a display font, decorative initials and a font of keyboard glyphs.

⁴ <http://georgduffner.at/ebgaramond>

⁵ <http://image.linotype.com/files/pdf/specimen.pdf>

⁶ <http://www.linolibertine.org/>

3 Implementation notes

3.1 Introduction

Traditionally, font-support packages have relied on `fontinst`; this package assumes Type 1 (Postscript) font format, which commercially is increasingly considered to be a legacy format. It is possible to use `fontforge` or other software to convert a TrueType or OpenType font to Type 1 format and re-encode it to, say, Adobe encoding, but incorporating features such as old-style figures or small capitals is a rather painful process, described in full detail in the `fontinstallationguide` document available at CTAN.

The `otftotfm` program of the `lcdftypetools` package will convert an OpenType font to Type 1 format *and* generate font metrics, virtual fonts, and encoding vectors for use with conventional \LaTeX engines, including support for small capitals, old-style figures, titling glyphs, superior figures, swash glyphs, and so on, when these features are provided by the font. And the `autoinst` script in the `fontools` package will process an entire *family* of fonts using `otftotfm`, producing also the `fd` files (in any choice of encodings) needed by \LaTeX .

It is true that emerging technologies (X_{\LaTeX} and $\text{Lua}\LaTeX$) make it possible for users to access all the features of modern fonts *directly*, but using radically different font-specification mechanisms provided by the `fontspec` package. This is not a viable approach for processing legacy documents.

A solution to this dilemma is to implement a support package that, as much as possible, compatibly supports *both* traditional processing engines (\LaTeX , $\text{pdf}\LaTeX$) *and* emerging technologies based on `fontspec`. For example, any current \LaTeX engine produces the Quattrocento sample of the preceding section from the following input:

```
\documentclass{article}
\usepackage{quattrocento}
\begin{document}
\thispagestyle{empty}
\begin{center}\huge
Q\,U\,A\,T\,T\,R\,O\,C\,E\,N\,T\,O
\\ \Large
A Classic Roman Typeface
\end{center}
\par\noindent
Lorem ipsum dolor sit amet, consectetur
adipiscing elit. Ut purus elit, vestibulum
...
\end{document}
```

As we shall see, it is relatively straightforward to implement this approach.

For concreteness, we give detailed instructions for re-constructing the `quattrocento` package. We assume a Unix-like system and that current versions of `fonttools`, `lcdftypetools` and `fontforge` (or comparable font-editing software) are available.

3.2 Accessing and converting the fonts

The “source” fonts may be downloaded from the GWF site (or others⁷); one should get complete fonts rather than subsets. The fonts distributed for Quattrocento and its Sans counterparts are in TrueType format; to support `latex` → `dvips` processing, they should be converted to `otf` format in `fontforge` as follows:

File → Generate Fonts → OpenType (CFF) → Save

There are “missing” variants for Quattrocento (no italics); generate an artificially slanted font as a substitute as follows:

Edit → Select → Select All

Element → Style → Oblique → OK

Then change the FontName to, for example,

`Quattrocento-Italic`

and the “Name For Humans” to

`Quattrocento Italic`

as follows:

Element → Font Info

Finally, set the italic angle as follows:

General → Italic Angle Guess → OK

Then generate the corresponding OpenType font.

Note that some discretion is advisable in generating artificial substitutes. My attempt to produce artificially emboldened variants for `ebgaramond` was (justifiably) vetoed as undesirable by the designer, whereas artificially slanted or emboldened variants of a *monospaced* font should be acceptable.

3.3 Generating L^AT_EX support files

To generate support files in a `texmf` tree for Quattrocento, put the relevant `otf` files in a directory and execute

```
autoinst -target=./texmf \
  -encoding=OT1,T1,LY1,TS1 \
  -vendor=impallari -typeface=quattrocento \
  -noupdmap \
  *.otf
```

Then create the directory

```
texmf/fonts/opentype/impallari/quattrocento/
```

and move the `otf` files there. Repeat as above with the `otf` files for Quattrocento Sans.

⁷ <http://www.fontsquirrel.com/>

3.4 Renaming the encoding files

The `otftotfm` program generates encoding files with filenames of the form `a_XXXXXX`; to avoid possible filename conflicts with other packages, the files in

```
texmf/fonts/enc/dvips/quattrocento
```

should be re-named (use a small script) to have a distinctive prefix, such as `qtrcnt_`. Then, in the two map files in

```
texmf/fonts/map/dvips/quattrocento
```

all instances of `a_` should be changed to `qtrcnt_`. The map files may then be merged into a single file, say, `quattrocento.map`.

3.5 Generating Type 1 fonts

The `otftotfm` function called by `autoinst` will use `cfftot1` to create `pf` files with appropriate internal names and filenames, and `autoinst` will install these in

```
texmf/fonts/type1/impallari/quattrocento/
```

but if more than one font family has been processed or if `cfftot1` runs into trouble with some glyphs, this may not happen. In that case, one must do the conversion font-by-font using either `cfftot1` or `fontforge`, which is less sensitive than `cfftot1` to bad glyph programs. The internal names and filenames must be those specified in the corresponding map file or `dvips` will fail.

3.6 Editing L^AT_EX support files

The `autoinst` script will generate a large number of files with `.fd` extensions in the

```
texmf/tex/latex/quattrocento/
```

directory. Recent versions of `autoinst` will generate “silent substitution” rules for mapping `sl` to `it` and `bx` to `b`; if not, these should be added by hand.

The `autoinst` script will also have generated a file with `.sty` extension for each of the font families; however, these do not support direct use of OpenType fonts by X_YL^AT_EX and LuaL^AT_EX, and it is necessary to generate a style file suitable for *all* L^AT_EX engines “by hand”. The basic idea is to use traditional settings such as

```
\renewcommand*\rmdefault{Quattrocento-TLF}
\renewcommand*\sfdefault{QuattrocentoSans-TLF}
```

for Type 1 support, and compatible `fontspec` settings such as

```
\defaultfontfeatures {
  Ligatures=TeX ,
  Extension = .otf
}
\setmainfont[ UprightFont = * ,
              ItalicFont   = *-Italic ,
```

```

        BoldFont      = *-Bold ,
        BoldItalicFont = *-BoldItalic ]
    {Quattrocento}
\setsansfont[ Scale = \QuattrocentoSans@scale,
  UprightFont    = * ,
  ItalicFont     = *-Italic ,
  BoldFont      = *-Bold ,
  BoldItalicFont = *-BoldItalic ]
  {QuattrocentoSans}

```

for OpenType support.

Initially, the choice between Type 1 and OpenType support is determined by the processing engine:

```

\ifxetex\quattrocento@otftrue
\else\ifluatex\quattrocento@otftrue
\else\quattrocento@otffalse % [pdf]LaTeX
\fi\fi

```

however, some users of X_YL^AT_EX or Lua^AT_EX may prefer to avoid `fontspec`, so an option is provided to allow this to be changed:

```
\DeclareOptionX{type1}{\quattrocento@otffalse}
```

After all the options have been processed, the choice of settings may be made as follows:

```

\ifquattrocento@otf
...
\else
...
\fi

```

The full `quattrocento.sty` file may be viewed by installing `quattrocento`, or at CTAN;⁸ Here we briefly discuss some issues.

- `autoinst` generates support files for “superior” (i.e., superscript) figures, but the Quattrocento fonts provide only figures 1, 2 and 3, so the style file should ignore these. See `ebgaramond.sty` for an example of support of superior, old-style and proportional figures and swash italics.
- The `\dots@scale` commands are invoked in the `fd` files or when specifying fonts with `fontspec`; but only the scale factor for Quattrocento Sans is adjustable using an option parameter.
- If the `sfdefault` option has been invoked, `\let` is used to set `\familydefault` to the *current* value of `\sfdefault` (without change to the value of `\rmdefault`).
- The final step is to remove all *default* font features in `fontspec`, in case other fonts will be activated by the user.

⁸ <http://mirror.ctan.org/fonts/quattrocento/latex/quattrocento.sty>

4 Linux Libertine and Biolinum redux

These fonts were fully supported for both traditional and emerging processing engines for some time and have been very popular; however, the L^AT_EX and pdfL^AT_EX support used `fontinst`, and when the original developer abandoned the project and the upstream fonts were updated, it became impractical to maintain the original package.

It has been possible to use `autoinst` as described above to create a new `libertine` package which provides reasonable support for traditional engines (including the display and initial fonts), and fairly complete support for emerging engines (including commands to generate arbitrary glyphs). Complete details and notes on the implementation may be found in an Appendix of the package documentation.⁹ The last version of the original `libertine` package (now called `libertineotf`, for Lua^AT_EX and X_YL^AT_EX users only) is still available at CTAN.

5 Discussion

To conclude, here are links on CTAN to package information for the above fonts and software:

- <http://ctan.org/pkg/quattrocento>
- <http://ctan.org/pkg/cabin>
- <http://ctan.org/pkg/ebgaramond>
- <http://ctan.org/pkg/librebaskerville>
- <http://ctan.org/pkg/libertine>
- <http://ctan.org/pkg/libertineotf>
- <http://ctan.org/pkg/fonttools> (for `autoinst`)
- <http://ctan.org/pkg/fontspec>
- <http://ctan.org/pkg/lcdf-typetools>

I hope the reader will find some of the newly available font packages of interest for their L^AT_EX documents and may also be inspired to add to the repertoire of L^AT_EX-ready fonts with support packages suitable for both traditional and emerging processing engines.

Acknowledgements

I would like to thank Karl Berry, Georg Duffner, Silke Hofstra, Khaled Hosny, Eddie Kohler, Marc Penninga, Michael Sharpe, and Herbert Voss for their assistance and suggestions.

- ◇ Bob Tennent
School of Computing
Queen’s University
Kingston, K7K3S7
Ontario, Canada
`rdtennt (at) gmail dot com`

⁹ <http://mirror.ctan.org/fonts/libertine/libertine.pdf>