

# Gentium for T<sub>E</sub>X

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## Abstract

This document briefly describes the T<sub>E</sub>X/L<sup>A</sup>T<sub>E</sub>X support provided by this package, gentium-tug, for the Gentium font collection released by SIL. gentium-tug includes Type 1 versions of the fonts, as well as the original TrueType fonts released by SIL.

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## 1 Introduction

This document explains how to use the T<sub>E</sub>X/L<sup>A</sup>T<sub>E</sub>X support in the present package for the Gentium font collection developed by SIL. This package includes fonts in PostScript Type 1 format converted from the original TrueType files released by SIL (using the FontForge routines found in this package). These Type 1 fonts use the name ‘Gentium’ by permission of SIL to the T<sub>E</sub>X Users

Group. Therefore the name of this T<sub>E</sub>X package, by request of SIL, is gentium-tug. Its home page is <https://tug.org/gentium>, and there is a public mailing list at [gentium@tug.org](mailto:gentium@tug.org) (<https://lists.tug.org/gentium>).

Further information about the fonts themselves can be found in the included documentation and at <https://scripts.sil.org/gentium>. The fonts are released under the SIL Open Font License. For details, see `ofl.txt` and `ofl-faq.txt`. (In the event of releasing modified versions of the fonts, either TrueType or Type 1, it's required to use a name that doesn't include "Gentium", per the OFL.)

This T<sub>E</sub>X/L<sup>A</sup>T<sub>E</sub>X support package consists of metrics, map files, style files, documentation, and so on. These files are released under the Expat license. The text for both licenses is included at the end of this document, and in files in the distribution.

If you have the package installed and just want to know how to use Gentium in your L<sup>A</sup>T<sub>E</sub>X documents, feel free to skip to section 4.2. Gentium support is included in the main ConT<sub>E</sub>Xt distribution and not through this package.

Please report any problems (contact info on the web page). If you can also send a fix, so much the better.

## 2 Gentium collection background

This package uses the original GentiumPlus 6.101 fonts (families GentiumPlus and GentiumBookPlus, four fonts each). These two families together can be considered as one super-family containing eight different weights.

GentiumPlus is a seriffed design. The fonts support a wide range of Latin, Greek and Cyrillic characters.

This package does not use the Berry fontname scheme, but longer names similar to those of Latin Modern, etc.

## 3 Installation

If you are using a reasonably recent MiK<sub>T</sub>E<sub>X</sub> or T<sub>E</sub>X Live or distro installation it should be enough to install the gentium-tug package (if it's not already present).

Otherwise, or if you want to install the font manually, you will in general need to perform these steps:

1. choose whether to install the font system-wide or in a personal directory;
2. move or copy the package files to the appropriate location;
3. refresh the T<sub>E</sub>X database;
4. incorporate the included map file fragments for the different engines.

That’s all that makes sense to say here. It’s beyond the scope of this Gentium documentation to explain all the myriad ways in which T<sub>E</sub>X-world map files can be installed and used; there are differences between T<sub>E</sub>X Live and MiK<sub>T</sub>E<sub>X</sub>, too.

Instead, we refer you to an explanation of the system-wide installation, with information for both MiK<sub>T</sub>E<sub>X</sub> and T<sub>E</sub>X Live, at <https://tug.org/fonts/fontinstall.html>. A corresponding explanation for personal installation is at <https://tug.org/fonts/fontinstall-personal.html>.

Those pages describe using `testfont.tex` for a basic test of the font; a sample tfm file name to use with that is `ec-gentiumplus-regular`.

To further test your installation and that the package works on your system, run L<sup>A</sup>T<sub>E</sub>X on this `gentium.tex` source file. (You’ll need some commonly-available L<sup>A</sup>T<sub>E</sub>X packages too, or comment them out.) The console output and/or log should tell you whether any fonts were not found. You can also compare your output with the original `gentium.pdf`.

## 4 Gentium T<sub>E</sub>X support packages

In general, for L<sup>A</sup>T<sub>E</sub>X it suffices to include `\usepackage{gentium}` in your document preamble.

Alternatively, you can do `\usepackage{gentiumbook}` to load the GentiumBookPlus fonts for your document, instead of GentiumPlus. The most noticeable difference is that the Book fonts are a lighter weight.

The only prerequisite is that these L<sup>A</sup>T<sub>E</sub>X packages require `xkeyval`, which you almost certainly already have.

### 4.1 Encodings

The package supports not only the most common Latin encodings such as OT1, TeXnANSI/LY1, Cork/EC/T1 and Text Companion/TS1 encodings, but also other Latin, Greek and Cyrillic encodings. Most characters in the text encodings and some of those in the Text Companion encoding are available, including the €. You can see the available encodings in table 1. The Greek encoding LGR is supported only in L<sup>A</sup>T<sub>E</sub>X.

script	available encodings
Latin	OT1, T1, LY1, L7x, QX, T5, TS1
Cyrillic	T2A, T2B, T2C, X2
Greek	LGR (L <sup>A</sup> T <sub>E</sub> X), AGR (ConT <sub>E</sub> Xt)

Table 1: Available encodings in gentium-tug.

The Latin and Cyrillic encodings support also small caps.

Cork/T1 encoding lacks visible space, cwm (compound word mark), SS and the character for composing permille sign.

## 4.2 L<sup>A</sup>T<sub>E</sub>X

To use Gentium fonts in a L<sup>A</sup>T<sub>E</sub>X document, add `\usepackage{gentium}` to your document preamble. This will set the default serif/roman family to gentium.

You can also use `\usepackage{gentiumbook}`, which will set the Gentium Book Plus family as the default.

The package `gentium` uses not only the family `GentiumPlus`, but also the family `GentiumBookPlus` for additional weights (semi bold and extra bold). Likewise, the package `gentiumbook` uses not only the family `GentiumBookPlus`, but also the family `GentiumPlus` for additional weights (semi light and semi bold). That means that both packages enable access to all eight fonts. The difference is in which fonts are used for the most common weights, medium and bold, and which weights are added. You can see what's available in table 2.

upright font	italic font	gentium	gentiumbook
GentiumPlus-Regular	<i>GentiumPlus-Italic</i>	<b>m</b>	sl
GentiumBookPlus-Regular	<i>GentiumBookPlus-Italic</i>	sb	<b>m</b>
<b>GentiumPlus-Bold</b>	<b><i>GentiumPlus-BoldItalic</i></b>	<b>b</b>	sb
<b>GentiumBookPlus-Bold</b>	<b><i>GentiumBookPlus-BoldItalic</i></b>	eb	<b>b</b>

Table 2: Available weights in `gentium` vs. `gentiumbook`.

You can set the desired weight with the command `\fontseries`, like this:

```
\fontseries{sb}\selectfont
```

You can also use the command `\usefont`, like this:

```
\usefont{T1}{gentium}{sb}{n}
```

If you want to use Gentium together with another font (sans or typewriter) that has a different x-height, consider using the option `scaled`. This scales the Gentium font and if you choose the right scaling factor, you will get the same x-height of both fonts. Here is an example of this option:

```
\usepackage[scaled=0.9]{gentium}
```

The default definition of the L<sup>A</sup>T<sub>E</sub>X logo does not work well with Gentium. Although “T<sub>E</sub>X” does not look too bad by default, since we change L<sup>A</sup>T<sub>E</sub>X, we also change T<sub>E</sub>X. This document modifies the logos using the `metalogo` package as follows:

```
\usepackage{metalogo}
\setlogokern{La}{-.28em}% default -.36em
\setlogokern{aT}{-.12em}% default -.15em
%
\setlogodrop[TeX]{.45ex}% default .5ex
```

### 4.3 Changes in the Type 1 fonts vs. the TrueType originals

The shapes of all characters in the Type 1 fonts are the same as in the original TrueType fonts, except for the unavoidable changes induced by the format conversion (that is, the spline representations are necessarily different).

However, a few explicit changes—hopefully improvements—were made to the kerns in the GentiumPlus family. The Type 1 fonts are used to generate the  $\TeX$  font metric files (tfm), so these changes propagate to the 8-bit engines like pdf $\TeX$ .

The first change concerns Greek. 8-bit Greek encodings (LGR and AGR) do not use precomposed accented capital letters. These letters are composed as a sequence of two glyphs: accent + capital letter. The problem is that this sequence does not look like the precomposed letter—there is often big space between the accent and the letter. Therefore, there are some extra kerning pairs between accents and capital Greek letters. These kerning pairs are created automatically (the script is included in the sources) and the goal is to have the same relative position between the accent and the letter as in the precomposed letter. Thanks to these extra kerning pairs you should get better results for 8-bit engines. These changes are irrelevant for Unicode engines—they use the precomposed letters.

Another change for Greek was made in July 2019 (version 1.1.1), for the LGR encoding only (files `lgr-gentiumplus-regular.tfm` and `lgr-gentiumplus-regular.tfm`): ligatures were added such that a sigma at the end of a word (i.e., the compound-word-mark as a boundary character) or followed by punctuation is automatically changed to a final sigma, as is usual for that encoding. Thanks to Ralf Stubner for suggesting and then implementing this.

The second general change is in the letters dcaron (ď) and lcaron (ľ) that are used in the Czech and Slovak languages. (There was no need to change tcaron (ť) and Lcaron (Ľ) with the same accent.) There is no change of their shapes, and their advance widths are also untouched—the change is to add several kerning pairs with quite big negative values. Without these changes there was often a large space between dcaron or lcaron and the following letter, so the changes make the words containing these letters much more compact. You get these changes automatically if you use 8-bit engines. If you use Unicode engines with the original TrueType fonts, you get the original metrics. However, you can tell the Unicode engines to use the Type 1 fonts (which, again, append PS to the family name) like this:

```
\usepackage{fontspec}  
\setmainfont{GentiumPlusPS}
```

Then you get the additional kern pairs for dcaron and lcaron. The regrettable disadvantage is that you cannot use small caps.

The last (similar) change is that additional kerning pairs were added to the Type 1 fonts for accented Latin letters and small caps. The original TrueType fonts have no such kerning pairs. As with the Czech/Slovak changes, you get these changes automatically if you use 8-bit engines. If you use Unicode engines with the original TrueType fonts, you get the original metrics, but you can override as above (but since you cannot use small caps with that method, the kerning pairs for small caps become irrelevant).

## 5 Known bugs

There are problems in older versions of pdf $\TeX$  with small caps when using TrueType fonts. In particular, the Latin encoding T5 and all Cyrillic encodings are unusable. You can use the Type 1 version of the fonts or at least pdf $\TeX$  version 1.40.13 to avoid these problems.

The Gentium fonts are a work in progress and as such they still miss some features like kerning pairs for some letters. Currently, the GentiumPlus family has kerning pairs just for Latin letters without accents and for Greek letters; there are no kerning pairs for small caps, accented Latin letters or Cyrillic letters. The Type 1 fonts in this package have some additional kerning pairs for accented Latin letters and for small caps. Several kerning pairs were added also for Cyrillic letters, mostly the capital ones.

## 6 Licenses

The fonts in this page, both the SIL originals and the derived Type 1 versions, are released under OFL. The  $\TeX$  support files are licensed under the Expat License. Here are the full license texts.

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