Using Greek Fonts with LaTeX

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modified for LaTeX2e by

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Abstract

In this document I hope to show that typesetting Greek in LaTeX using the `lgreek` package (and the `gr` fonts) can be as easy as typesetting English text, and leads to equally good results. This is meant to be a tutorial, not an exhaustive discussion; some TeXnical remarks that should be useful after the reader has acquired some familiarity with the fonts are printed in fine print.

1 The Alphabet

In order to typeset Greek text, you need to go into "Greek mode." This is achieved by typing `\begin{greek}` anywhere in your document; Greek mode will remain in effect until you type a matching `\end{greek}`. While in Greek mode, the letters 'a' to 'z' and 'A' to 'Z' come out as Greek letters, according to the following code:

α	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ	ν	ξ	ο	π	ρ	ς	τ	υ	φ	χ	ψ	ω
a	b	g	d	e	z	h	j	i	k	l	m	n	x	o	p	r	s	t	u	f	q	y	w

There is no digamma yet. The same character 's' will print as 'σ' or 'ς', depending on its position in a word.

The system does this by accessing a ligature of 's' with any other letter that follows it. If, for some reason, you want to print an initial/medial sigma by itself (as in the table above), or at the end of a word, you should type 'c'.

Try to typeset some simple text now. Create a file containing the following lines:

```
\documentclass{article}
\usepackage{lgreek}
\begin{document}
This is English text.
\begin{greek}
This is Greek text.
\end{greek}
\end{document}
```

When you TEX this file, you get the following gibberish:

This is English text. Τηις ις Γρεεκ τεξτ.

If you give the `delims` option for the package then the character `$` can be used in place of both `\begin{greek}` and `\end{greek}`, as eg

```
This is English text.
$This is Greek text.$
```

The control sequences `\(...\)` are still available for in-text math.

2 Accents and Breathings

To get an acute, grave or circumflex accent over a vowel, type `'`, `` ` `` or `~`, respectively, before the vowel. To get a rough or smooth breathing, type `<` or `>` before the vowel (or rho) and any accent that it may have. To get an iota subscript, type `|` *after* the vowel. A diaeresis is represented by `"`, and if accompanied by an accent it can come before or after the accent.

For example, `>en >arq\~h| >\~hn <o l'ogos` gives ἐν ἀρχῇ ἦν ὁ λόγος. Neat, ain't it?

Accents and breathings, too, are typeset by means of ligatures: a vowel with a breathing, an accent and iota subscript, for example, is realized as a four-character ligature. The only exception is when a breathing is followed by a grave accent, in which case the breathing + accent combination is typeset as a TEX `\accent` over the vowel. This means that words containing such combinations cannot be hyphenated in (standard) TEX; but this is not a problem because, with the exception of very rare cases of crasis, all such words are monosyllables.

3 Punctuation

Here's the table of correspondences for punctuation:

```
.  ,  ·  :  !  ;  '   «   »
.  ,  ;  :  !  ?  ''  ((  ))
```

The last three entries represent the apostrophe and quotations marks. The other available non-letters are the ten digits, parentheses, brackets, hyphen, em- and en-dashes, slash, percent sign, asterisk, plus and equal signs. All of these are accessible in the usual way. In a future release there will be tick marks for numbers ($\alpha' = 1$, $,\alpha = 1000$).

4 Hyphenation

A hyphenation table for both modern and ancient Greek is currently being debugged. For now one can use the usual (English) hyphenation table, which gives the right results about 90% of the time (amazing, isn't it?). Be sure to proofread your text carefully, unless you've turned hyphenation off.

5 Interaction with other macros

While in Greek mode you can do just about everything that you can outside: go into math mode, create boxes, alignments, and so on. The file `greekmacros.tex` sets things up so that in Greek mode the control sequences `\tt` and `\bf` switch to a typewriter and a bold Greek font, respectively: thus `\texttt{s''>agap\~w}` gives `σ'ἀɣαπῶ`. (Try it.) On the other hand, there are no "italic" or slanted Greek fonts, so `\it` and `\sl` will give you the same fonts as outside Greek mode. The various constructions under LaTeX for increasing or decreasing point sizes don't work yet; they will in a future release.

The characters that form diacritics (`<`, `>`, `'`, `` ` ``, `\~`, `"` and `|`) are treated differently depending on whether or not you're in Greek mode. More exactly, under plain TeX these characters (with the exception of `\~`) have a `\catcode` of 12: they print as themselves, and they cannot appear in control words. But in Greek mode `'`, `` ` ``, `\~`, `"` and `|` are "letters", that is, they have a `\catcode` of 11, while `<` and `>` are active, with a `\catcode` of 13. This may be important even for beginners because it means that `'`, for example, can be taken as part of a control word. Thus the sequence

```
\begin{greek}
wm'ega\hfil'alfa
\end{greek}
```

will cause an error message about an undefined control sequence `\hfil'alfa`, instead of printing

ωμέγα ἄλφα

as you might expect. (I hope classicists will forgive this use of the modern Greek one-accent system.) The solution, of course, is to remember to add a blank after the `\hfil`.

A more subtle problem arises when you use Greek text in macro arguments, if the arguments are scanned while you're outside Greek mode. This is because TeX assigns `\catcode`s to tokens as it first reads them, so when the argument is plugged into the body of the macro the characters above have the wrong `\catcode`. If the legendary Jonathan Horatio Quick were to write

```
\def\hellenize#1{\begin{greek}#1\end{greek}}
\hellenize{d'uo >`h tre~is,}
```

he would be unpleasantly surprised by the following output:

δύο ῾η τρε ις,

which can be explained as follows: the `\~`, which should be a letter, is seen as an active character, and expands to a blank as in plain TeX; while the breathing, which should be active, is not, and in particular it doesn't do the right thing when next to the grave accent. Solutions to this problem require a bit of wizardry, and will not be discussed here; see, for example, Reinhard Wonneberger's article in the October, 1986 issue of *TUGboat*, especially pages 179–180.