Typesetting Greek texts by TEX and LATEX
— a summary of all tools available —

Dimitrios Filippou[1]

Jan. 29, 1994

[1]Dimitrios Filippou wrote this short note while he was a doctoral student at the Department of Mining and Metallurgical Engineering of McGill University, Montréal, Québec, Canada. His permanent address is: Kato Gatzea, GR-385 00 Volos, Greece.

The following text contains some information on whatever exists for typesetting by TeX documents which contain entirely or in part Greek text. Those who would like to typeset Greek texts not by plain TeX, but rather with LaTeX, may find this short article quite useful as well.

This article is not a cookbook for Greek TeXing. In fact, all that is presented here, is just a summary of starting pointers for someone who wishes to typeset the poems of Sappho (late 7th–early 6th c. B.C.) or Odysseus Elytis (1911–) in their original script. My personal experience during the past few years, says that even these pointers can be extremely helpful when you are striving to typeset real Greek texts in an environment where Greek characters are "something to be used only in mathematical formulæ".

Therefore, the following text contains some information on

- Greek fonts created for TeX by METAFONT (this will be of great interest to the few ones who like to play with METAFONT),
- complete TeX/LaTeX packages for typesetting Greek documents (the quick solution for anyone who wants to typeset Greek texts with TeX or LaTeX),
- where should one seek help in case he has problems to typeset Greek with TeX or LaTeX (the Greek connections ☺), and
- the future of typesetting Greek documents by TeX (just a short note on where TeXing Greek texts is heading to).

This short article is based on a note that I posted for the first time in the USENET newsgroup `comp.text.tex` in February 1993. That posting has been apparently archived under the name `help/greek.faq` at all CTAN sites:

`ftp.shsu.edu` (192.92.115.10),
`ftp.dante.de` (129.206.100.192), and
`ftp.tex.ac.uk` (134.151.79.32).

I hope that the gentle administrators of the network of TeX archives will replace that file by the present, more complete article.

Public domain Greek fonts for TeX

The first Greek fonts of TeX were those that D. E. Knuth created himself and which have become integral part of every TeX distribution. Of course, these fonts have been designed to be used in mathematical expressions, but in the absence of any other alternative, they may be used to typeset a few words of regular Greek text. The result though will be far from perfect, especially if the text is in ancient Greek, full of accents and diacritical marks. In such a case, you must look for some other Greek fonts.

Silvio Levy (Princeton University, New Jersey, USA) was the one who created the first family of fonts for typesetting Greek text with TEX. Levy's fonts were created by METAFONT and appeared by the mid-80s, just as TEX version 3.0 started coming out. That was an 8-bit font family and included regular, slanted, bold and typewriter typefaces. Levy made his Greek fonts after the Didot design, a typeface which was originally created two centuries ago by the famous Didot printers in Paris and which is still used extensively by Greek printers today. Among Greek printers, this Didot typeface is known as *Ἁπλᾶ* (plain), but often outsiders call it incorrectly "Greek roman".

The METAFONT source code of Levy's fonts is still available in some FTP sites (usually in font collections). Nonetheless, it is not worth to bother with these METAFONT sources, because Levy's fonts have been surpassed by the similar ones that where subsequently created by Yannis Haralambous (Villeneuve d'Ascq, France).

Yannis Haralambous' family of Greek fonts looks the same as Levy's one, i.e., it is of the Didot kind, but uses a different 8-bit coding scheme. It contains five typefaces: regular, slanted, bold, "italics" (these "italics" are kind of pseudo-italics based on the Greek math characters of the Computer Modern fonts) and small caps. Within the small caps of Haralambous, you will find some extra characters such as digamma, qoppa and sampi, which are useful in writing Greek numerals. The METAFONT sources are available by FTP from many **`fonts/greek`** collections and some old `babel` collections such as

> `ymir.claremont.edu` (`134.173.4.23`),
> directory: **`TEX.BABEL.GREEK.YANNIS`**.

Together with his fonts, Yannis Haralambous has also put a few essential macros to allow the easy use of the fonts.

In the time between Levy's and Haralambous' works, Brian Hamilton Kelly (Royal Military College of Science, Swindon, UK) also presented a family of Greek fonts. Apparently these fonts (Greek "roman", "italic", bold and typewriter) were created out of the Greek characters of the Computer Modern math fonts. I have never tested Hamilton Kelly's fonts, but, as their author says, they were created only for modern uni-accent Greek; they will not work for multi-accent ancient or modern Greek. The METAFONT sources of these fonts are available by FTP from

> `ymir.claremont.edu` (`134.173.4.23`),
> directory: **`TEX.BABEL.GREEK.HAMILTON_KELLY`**.

The two public domain Greek TEX packages which have been put together by Moschovakis and Dryllerakis and which are discussed later in this article, are heavily based on the original work of Levy and Haralambous. In terms of fonts, both these public domain Greek TEX packages include Levy's and/or Haralambous' original work only slightly modified. Moschovakis, for example, has added his own experimental "Greek italics" and "Greek sans serif".

Commercial Greek fonts for TEX

SCHOLAR TEX is a commercial TEX package that has been created by Yannis Haralambous. It includes fonts and macros for modern Greek, ancient classical Greek, ancient epigraphical Greek and ("in the near future", according to the author) Byzantine Greek. Indeed, the scholar may find this package extremely useful as, in addition to Greek, it includes fonts for a number of other non-Latin alphabets: Arabic, old Turkish, Persian, Urdu, Malay, Armenian, etc. SCHOLAR TEX is also the only package available at this moment that contains complete hyphenation tables for ancient classical Greek and modern Greek (hyphenation rules are not the same for ancient and modern Greek).

The price of SCHOLAR TEX is US$200 for individuals (US$100 additional for METAFONT sources) and US$500 for institutions (includes METAFONT sources). For orders or more information, you can contact:

Yannis Haralambous
101/11 rue Breughel,
59650 Villeneuve d'Ascq,
France

e-mail: `yannis@gat.univ-lille1.fr`
fax: +33 20.91.05.64

You must specify to the author of SCHOLAR TEX what is the operating system where you intend to use his product.

C. Mylonas and R. Whitney have also created Greek fonts for TEX. Their fonts designed after the Times-Elsevier Greek typefaces, which are very different from the Didot one. The most striking thing of Mylonas and Whitney's work, which has been published in the *TUGboat* [vol. 13 (1992), no. 1, pp. 39–49], is that it contains the most complete Greek character set I have ever seen: 360 characters in total! The creators of these last fonts have reported that they are continuously improving their work and that they have already prepared macros and hyphenation tables for modern Greek and ancient Greek. Nonetheless, they have decided not to distribute or sell their fonts for the moment.

Public domain Greek TEX packages

At this moment, there exist two complete public domain packages with fonts and macros for typesetting Greek documents by TEX or LATEX. These are:

1. `greektex` version 2.0 (?) by Yiannis Moschovakis (UCLA, Los Angeles, USA), and

2. GREEKTEX version 3.1 by Kostis Dryllerakis (Imperial College, London, UK).

The names of these packages are indeed identical. Hence, in order to distinguish the one from the other, I have denoted the first one with typewriter letters and the latter one with small caps and the TEX logo.

Both these packages include a number of 8-bit fonts: regular, slanted, typewriter, etc. They also include macros for typesetting ancient or modern, uni-accent or multi-accent Greek by either plain TEX or LATEX. Greek hyphenation tables are also provided in these packages. However, these tables have been prepared according to the hyphenation rules of modern Greek; therefore, they may give a few erroneous results with ancient Greek texts.

Particularly for LATEX users, Moschovakis has included in his `greektex`, a style file for entirely Greek articles. Dryllerakis, from his side, has added a Greek article and a Greek book style file in GREEKTEX. These Greek style files are in reality the standard LATEX article and book style files with just few modifications, mostly in titles. GREEKTEX also includes a `greek.sty` which comes very handy to those who want to include only a few Greek quotes in their documents.

The Greek TEX packages are accompanied by "filters" for character translation. With these filters, the packages can be used under any system which accepts standard 7-bit ASCII encoded input such as UNIX, DOS, etc. However, each of these packages was originally created under a different operating system. Consequently, `greektex` is more friendly to use on a DOS machine, because it allows the user to type in Greek or Latin directly. On the other hand, I find GREEKTEX a better choice for UNIX running machines, since at many UNIX terminals you cannot edit a document with Greek characters encoded at ASCII positions above 127. For DOS machines, GREEKTEX works very well with the `texconv` filter of emTEX. Kostis Dryllerakis has also reported that his GREEKTEX has been used succesfully on a Macintosh (I would think with OzTEX).

The fonts of `greektex` include the basic Computer Modern Latin characters at their original posistions (ASCII below 127). Contrary to this, the fonts of GREEKTEX do not include any Latin characters, but only Greek ones. For that reason, TEX users who want to avoid duplicating the font files in their disks, should go for Dryllerakis' package. I would recommend Moschovakis' `greektex` to those who want to typeset entirely (or or almost entirely) Greek texts by TEX on their DOS machine. However, those who will pick up Moschovakis' package should be aware that their `.tex` file may not be easily transfered from one machine to another. Portability seems to be the biggest advantage of the other package, Dryllerakis' GREEKTEX, even if editing something for Greek output by GREEKTEX is a bit more tedious. GREEKTEX also seems to be the more suitable Greek TEX package for the New Font Selection Scheme (NFSS) and the upcoming LATEX version 3.0.

For those who are interested, Moschovakis' `greektex` is available by FTP from

`math.ucla.edu` (`128.97.4.254`) [original site],
directory: `pub/moschovakis/greektex`

and in all CTAN sites (these sites are listed at the beginning of this article) in the directory:

`fonts/greek/moschovakis`.

Dryllerakis' GreekTEX is available from

`laotzu.doc.ic.ac.uk` (`146.169.2.9`) [original site],
directory: `public/tex`

and in all CTAN sites in the directory:

`fonts/greek/kd`.

It is worth to add at this point that each Greek TEX package takes about 2 Mb of space on the hard disk of my PC. This includes documentation files, files with macros, format files, `.tfm` font files and `.pk` font files for a HP Laserjet printer.

In addition to these packages, a few fellow Greeks have mentioned to me that at two Univesities in Greece, the University of Patras and the University of Crete, there have been created, installed and distributed to students some other Greek TEX packages. From fragments of information I gathered, I have come to the conclusion that these packages have been built up on Levy's original work. Unfortunately, these "very Greek" TEX packages have not been archived at any FTP site and I could not find a copy of them.

Contacting the Greek TEX community

Most of the fonts, macros, and packages that were described in the previous paragraphs have been created by people who have showed much enthusiasm on typesetting Greek by TEX, but without any intention of making money out of this story. Their work is available to the public at no-charge, but it can not be guaranteed that it is error-free or that everything will be OK under any TEXing circumstances. Sometimes, you may have to do a bit of hacking and, if like me you are not a TEXnician, you may find yourself often frustrated.

Thus, in the case you face problems with typesetting Greek with TEX, but also if you have new ideas about this subject, you should join the `ELLHNIKA` mailing list. To do this, just send a message to `LISTSERV@DHDURZ1.BITNET` by e-mail. This message must contain only one line in its body:

`SUBSCRIBE ELLHNIKA` <*your 1st name*> <*your last name*>

The list has currently about 80 subscribers with Yannis Haralambous being the list owner. Once you are a subscriber to this list, you may send your questions, your problems, or your ideas to **ELLHNIKA@DHDURZ1.BITNET**. Ultimately, you may also post your problem or request to the relevant newsgroup of USENET, namely `comp.text.tex`.

The future of Greek TeX

The fact that there exist two Greek TeX packages now available in public domain reveals a subtle fight among Greek TeXnicians for the future of Greek TeX. On the one side, there are those who want pure Greek fonts (i.e., not attatched to any Latin character set) harmonised with the NFSS and the upcoming LaTeX version 3.0. This is what can be achieved with a package like Dryllerakis' GreekTeX. The problem with the pure Greek fonts is that the basic Greek characters are encoded in 7-bit ASCII positions: you have to type **q** to get χ, **y** to get ψ, etc. Editing the TeX/LaTeX source code becomes rather difficult and unfriendly, especially for a new user of GreekTeX who may be accustomed to a certain Greek keyboard layout. The use of filters may make life slightly easier, but it is not the same as typing directly Greek into your TeX/LaTeX code.

This is exactly the arguement of the "other side", those who prefer more machine-specific packages like Moschovakis' **greektex**, which allow the user to edit a TeX/LaTeX source code directly in Greek on his/her machine. But here, the biggest problem is portability, because almost every computer maker uses his/her own Greek upper ASCII coding scheme.

In any case, time has come for some *standarisation* at least on Greek TeX character encoding. The TeX Users Group (TUG) realised this necessity not only for Greek TeX, but also for using TeX with any language other than English. TUG therefore formed the *Technical Working Group on Multilingual Coordination* (TWGMLC) for the development and standarisation of a truly multilingual TeX/LaTeX. Yannis Haralambous took the responsibility of leading the TWGMLC and Silvio Levy has become the chair of the Greek subgroup.

More specifically, the target of the TWGMLC is to provide every user of TeX or LaTeX with a minimum "TeX Language Package" which will include: (i) standardised software (fonts and macros), and (ii) a minimum documentation about TeX and LaTeX in the language of the user. For the time being, the TWGMLC has not released anything from its project. Soon though, and hopefully at the time of the release of LaTeX version 3.0, we may have the first manuals of Greek TeX or LaTeX *in Greek* ☺!

Beyond the effort of the TWGMLC, it is worth noting that Brian Hamilton Kelly, and C. Mylonas and R. Whitney have also reported considerable improvements on their own fonts and macros, but they are not releasing them yet. Yannis Haralambous is working on Byzantine Greek, a new true Greek typewriter and a new sans serif font. And Kostis Dryllerakis has promised that the next version of his GreekTeX will be NFSS-compatible and that his fonts will include the almost obsolete Greek characters digamma, qoppa and sampi. *'Ιδῶμεν*. . . (We'll see. . .)

Acknowledgements— If I were to thank people who helped me to put this information together, I would have to make a long list of names and e-mail addresses. Everyone who showed me even tiny details about TeX and LaTeX has contributed in his way into putting this information together. However, there are four people who have helped me considerably and whom I feel obliged to name:

Leonidas J. Irakliotis (`l.irakliotis@ieee.org`),
Yiannis N. Moschovakis (`ynm@math.ucla.edu`),
Kostis Dryllerakis (`kd@doc.ic.ac.uk`), and
Yannis Haralambous (`yannis@gat.univ-lille1.fr`).