

# On Text Preparation With Latex

## 1 Attitude

In traditional publishing authors submitted ugly draft copy, sometimes even hand written, and typesetters made it into beautiful printed pages. Tex is a typesetter.

It begins with the attitude that publication is a collaboration between authors and typesetters. Authors, it assumes, are dumb as a post about setting type, a job for graphic professionals. But only authors understand the structure of their work. So what the author should do is provide structure, to clearly delineate which elements are which. And the typesetter's job is to make it beautiful on the page.

Conventional word-processing gets it reversed. Programs like word do not demand structure—or even very much respond to structured inputs—and they do demand that you concern yourself with the appearance of the print, choosing fonts, styles, highlighting, spacing, margins, justification, and on and on. Author's are inept at the task and make consistently bad choices producing ugly print. And even if we were experts, word-processing programs do not know how to set type and in the hands even of typesetters, could not produce a satisfactory page.

So Tex demands that the author take charge of structure and says “hands off” about appearance. In effect Tex says, “We are professionals at this business and you are an amateur, so accept our decisions and use our defaults because changing anything will make it worse.”

If like the look of Word documents, don't waste your time on Tex. Tex is about producing professional quality type setting that Word is not capable of doing with any amount of work.

LaTeX is not WYSIWYG by design. You can't view a typeset page on a computer display. And LaTeX's attitude is “why would you want to? You are not in charge of appearance.”

## 2 Tex, LaTeX, Bibtex, and WinEdt: How the parts fit together

**Tex** A typesetting program: the industry standard, the means by which all professional typesetting is now done. Tex is raw and hard to use, because it was never intended to

structure or format a document. It does only low-level type-setting—and does it beautifully. It was originally intended to do digitally what typesetters did at old fashioned linotype machines, setting hot lead print.

TeX was created by Donald Knuth, arguably the best computer programmer who ever lived. TeX's intended audience is publishers and printers, those at the production end of publication.

**LaTeX** LaTeX is Leslie Lamport's set of meta-commands to drive TeX. LaTeX was designed to be used by authors. It gives us the power to assert the structure of our prose, e.g., to declare a section a heading of a certain level, and passes on the TeX the job of deciding how it should look on the page.

Virtually all professional publishing now uses LaTeX2e. If you submit copy in, for example, Word, it will be translated into LaTeX to build the final pages. So if you use LaTeX, your draft copy will look exactly like final published copy.

**MikTeX** is the current implementation of LaTeX 2e. LaTeX names a standard, a set of protocols. MikTeX is the actual program that implements the LaTeX standard.

**WinEdt** LaTeX is entirely ascii and doesn't care what sort of editor is used to compose LaTeX commands. WinEdt is a particularly good ascii editor that is designed around the assumption that users are producing LaTeX documents. It has handy TeX-related features and also a set of clickable buttons that produce various kinds of files, and particularly the DVI (device independent compiled document).

**Yap** Yet-Another-Previewer is now the standard DVI previewer.

All of this comes as a package when you install TeX.

**Pronunciation** Is it lay-tech or la-tech? Lamport, who gives it its name, is agnostic between them, neither of which is like the laaa sound of Lamport.

### 3 Document Conversion: Word2tex

Free for limited use. Costs \$45 for registered, unrestricted, version. Works pretty well. Tables come out excessively formatted, but that is a word problem, not conversion. In word

they are excessively formatted.

One limitation that bugs me is that you can only use it on one machine. So I can't demo it because my one machine is my home desktop.

### **3.1 Document Conversion: Tex2word**

Don't bother. It doesn't work at all for tables and doesn't work very well for other things. Not worth \$45. Besides that, if you have learned Tex, you won't want to mess with Word.

### **3.2 Structured Use of Word Produces Good Tex Conversions**

Structure, e.g.,

1. Use of heading levels which fit the logic of exposition
2. Use of styles to control formatting depending upon logical status.
3. Use of Word bullet points, auto lists, etc.
4. Footnotes and endnotes
5. Figure and table captions generated by Word, instead of loose text.

You will save time if you make these changes first in Word, where you would be more comfortable, rather than getting a crude translation into tex, which would then require a lot of hand work.

Tables do translate, but the Word table-maker defaults are so exotic—heavily over-formatted—that I never like the result in tex.

## **4 EPS Graphics**

(Encapsulated PostScript) The publication standard. Like the text, if you produce it first in eps, you know how it will look when published.

Conversion by word2tex OK (but often not previewable). wmf2eps shareware better. Allows cut-and-paste, for example, from excel into .eps graphs.

The bounding box issue.

## 4.1 Why EPS?

EPS is publishers' preferred format for graphic files. The reason is that EPS is a set of commands for drawing a graph, to be interpreted by the postscript driver chip. As such, it has no precision loss or rounding error. If, in contrast, you supply printed graphs, then their resolution can never be better than the printer on which you created them. Thus they come out in low resolution on the high resolution printers that publishers employ.

## 4.2 Ghostscript for EPS Graphic Viewing and Printing

Ghostscript allows you to view and print on a non-postscript printer any file formatted for post-script. Download from the web. Freeware, not shareware.

## 5 Don't Like LaTeX? Make Your Own Commands!

the "newcommand" command

## 6 Equations in Tex

The equation environment produces equations that are centered and numbered (which can be suppressed). See Equation 1.

$$y = \beta_1 x_1 + u \tag{1}$$

With just dollar signs to indicate the equation environment, the same formula can be included in the text and without a number.

You just write text around the equation  $y = \beta_1 x_1 + u$  like this.

Equation array is more powerful, allowing stacking multiple equations and aligning them as they should be, for example:

$$z_t = z_{t-1} + a_t \quad (2)$$

$$z_t - z_{t-1} = a_t \text{ (subtracting } z_{t-1}\text{)} \quad (3)$$

$$B^0 z_t - B z_t = a_t \text{ (by definition of } B\text{)} \quad (4)$$

$$(B^0 - B)z_t = a_t \text{ (factoring by } z_t\text{)} \quad (5)$$

$$(1 - B)z_t = a_t \text{ (the result)} \quad (6)$$

$$(1 - B)z = a \quad (7)$$

You control the three zones, before, at, and after the relationship symbol (usually “=” but not required) by placing ampersands before and after the equality. TeX then decides how it looks best on the page.

## 7 Books in Latex

LaTeX really shines on books. It understands the full structure and autogenerates front matter (lists of tables and figures, table of contents) and backmatter (references, endnotes if desired). It has a ”chapter” command that produces a super-header and provides numbering (e.g., 2.3 for the third equation in chapter 2) for equations, tables, and figures.

I have now done two books with LaTeX and would never consider anything else.

## 8 Other Stuff

packages, e.g., fullpage