

# Using latexmk With T<sub>E</sub>XShop.

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## What is latexmk?

Compiling a tex file that contains cross-references, bibliographic references and/or indexes is a multi-pass process; i.e., you've got to run (pdf/x<sub>e</sub>)`latex` multiple times with possible intermediate runs of `bibtex` and/or `makeindex` until all references are resolved. The `latexmk perl` program, rewritten and presently maintained by John Collins<sup>1</sup>, automates this multi-pass process. By default it first runs (pdf/x<sub>e</sub>)`latex` on a source file, determines file dependencies by examining the `log` file produced by the run and then automatically runs `bibtex` and/or `makeindex`, if needed, and the correct number of additional runs of (pdf/x<sub>e</sub>)`latex` to generate the bibliography, index and cross-references. Recent versions of `latexmk` also work correctly with the `nomenc` package as well as the `glossary` and `glossaries` packages and other packages that produce multiple bibliographies or indexes.

## What is here?

There is a set of five engine files to be moved from `~/Library/TeXShop/Engines/Inactive/Latexmk/` (where you are reading this document) two directories up, `~/Library/TeXShop/Engines/`. A second set of eight files are already in `~/Library/TeXShop/bin/` and consists of the `latexmk` program, five initialization (`rc`) files used by the five engine files and two shell scripts used for `pdftricks` and `pst-pdf` figure processing.

## Using latexmk with T<sub>E</sub>XShop.

There are five engine files; one for running `latex` (with a final run through `dvips` and `ps2pdf14`) [`latexmk.engine`], one for using `pdflatex` [`pdflatexmk.engine`], one for `xelatex` [`xelatexmk.engine`] and two for using the `pdftricks` or `pst-pdf` packages with `pdflatex` [`pdftricksmk.engine` or `pst-pdfmk.engine` respectively]. The exact form of the commands and options used are in the corresponding `rc` file (e.g., `latexmkrc` for the `latexmk.engine`) in `~/Library/TeXShop/bin/`.

You can use these engine files by using the drop down menu on the source tool bar or placing the line

```
%!TEX TS-program = pdflatexmk
```

(for using `pdflatex`—similar lines for `latex` and `xelatex`) at the top of your document; then simply using `Typeset` (⌘-T) will automatically run the proper engine. Using `latexmk` with the `epstopdf`, `pdftricks` and `pst-pdf` packages is discussed later.

I have only tested these engines with relatively trivial distributed documents (which include other files using `\include` commands) but it appears that `latexmk` deals

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<sup>1</sup>The `latexmk` web site is <http://www.phys.psu.edu/~collins/software/latexmk-jcc/>. You can get the latest version of `latexmk` at <http://www.phys.psu.edu/~collins/software/latexmk-jcc/versions.html>.

with them properly. Note that when compiling a file with name `rootname.tex` a file with name `rootname.fdb_latexmk`<sup>2</sup> is created. This file contains the dependency information for the distributed document so making changes in an included file will force the recompile of the root document by `latexmk`.

### Noteworthy Changes with `latexmk` v4.01 and later.

Versions of `latexmk` prior to 3.21c weren't able to deal with the `glossary`, `glossaries` or `nomenc` packages because they re-write their output file(s) with each run of `(pdf/xelatex)` or use custom file extensions. This changed with `latexmk` 3.21c. The `rc` files included with this version of `latexmk` for `TeXShop` are set to recognize the standard file extensions produced by these packages and process them correctly and "auto-magically." If you are creating custom glossaries or indexes you will have to properly edit the `rc` files (e.g., `pdflatexmkrc`) found in the `~/Library/TeXShop/bin/` directory to add the dependencies; it should be fairly clear from the contents of the `rc` files what has to be added to those files.

Another major addition in `latexmk` since 3.21c is support for packages that create multiple bibliographies and/or indexes; e.g., when the `bibunits`, `chapterbib`, `multibib`, `multind` or similar packages are used. The extra processing needed for those packages happens automatically. Unfortunately, the `index` package uses the same naming scheme<sup>3</sup> as the `glossary` and `glossaries` packages (see the sub-section below) so you need to define extra dependencies and processing rules in the provided `rc` files. There was a bug in `latexmk` 3.21j that didn't allow it to work properly with the `index` package when creating an ordinary index (an `.idx` file); this was corrected with version 4.01 of `latexmk`.

### Using the `epstopdf` package with `latexmk`.

Including `eps` graphics files directly in `pdflatex` documents requires the use of the `epstopdf` package. If you have an included `eps` file *and a converted pdf version of the file doesn't exist* the `epstopdf` package converts the `eps` file into a corresponding `pdf` file.

### Using `latexmk` with `epstopdf` version 1.4 and earlier.

With `epstopdf` versions 1.4 and earlier once the `pdf` image file exists the conversion no longer takes place *even if the `eps` file is updated*. The `pdflatexmkrc` file now contains a dependency that uses a new rule, built into `latexmk` 4.01 and later, that will delete a previously generated `pdf` file and then run `pdflatex` so that `epstopdf` will regenerate the `pdf` image file. **Note: The file name in your `\includegraphics` commands should *not* have an `eps` extension to prevent extra, unnecessary runs of `pdflatex`.**

### Using `latexmk` with `epstopdf` version 1.5 and later.

You can use the same (default with this distribution) processing with `epstopdf` 1.5 and later, however the `epstopdf` package, version 1.5 and later can check for an updated `eps` file and then recreate the `pdf` file if the `[update,prepend]` package options are used. The dependency checking by `latexmk` is still important to let `latexmk` "know" that an included `eps` file has changed but the deletion of the `pdf` image file is unnecessary. The `pdflatexmkrc`, etc., support files for `latexmk` 4.01 and later now contain a dependency and rule that will detect an updated `eps` file but let `epstopdf` do the conversion to `pdf`. By default this dependency is turned *off* in `pdflatexmkrc`; to

<sup>2</sup>The dependency file had extension `dep` in previous versions of `latexmk` but didn't do a complete job of keeping track of those dependencies.

<sup>3</sup>Custom extensions rather than standard extensions with custom root file names.

turn it on you should edit that file by commenting out the original dependency (place a # before the line

```
add_cus_dep('eps', 'pdf', 0, 'cus_dep_delete_dest');
```

in that file) and uncommenting the new dependency (remove the # from the start of the line

```
#add_cus_dep('eps', 'pdf', 0, 'cus_dep_require_primary_run');
```

in that same file). Remember that latexmk will work properly without making this change.

In version 1.5 and later of the `epstopdf` package you can also specify non-default processing for the `eps` to `pdf` conversion<sup>4</sup>. Since latexmk now lets the `epstopdf` package do all of the necessary processing of the `eps` file any customized processing defined in the `tex` source file will be used.

**Note: I have noticed that there are times when including the `eps` extension in `\includegraphics` still gives rise to additional runs of `pdflatex` so I still recommend you leave off the extension in `\includegraphics` commands.**

#### Using the `pdftricks` package with latexmk.

The `pdftricks` package allows the inclusion of `pstricks` graphics in documents compiled with `pdflatex`. The package generates a file for each postscript figure included in the document. Each of those figure files is then processed to produce a `pdf` file containing a figure with a tight enclosing bounding box. The `pdftricksmk` engine included with this version of latexmk processes the original file, the figure files, etc., all only if they have changed. To use the engine place the line

```
%%!TEX TS-program = pdftricksmk
```

at the start of the file and Typeset the file. The processing steps for each of the figure files is `latex`→`dvips`→`ps2pdf14`→`pdfcrop` to ensure the proper bonding box is created for each figure. **NOTE: you must use the `[nosHELL]` option to the `pdftricks` package or latexmk will get into a run-on condition. All figure processing will be taken care of by latexmk.**

#### Using the `pst-pdf` package with latexmk.

The `pst-pdf` package also allows the inclusion of `pstricks` graphics in documents compiled with `pdflatex`. When the source file is compiled with `latex` a `dvi` file containing all of the figures is created. Further processing through the sequence `dvips`→`ps2pdf14`→`pdfcrop` produces a single file that contains all of the figures with proper bounding boxes. A run of `pdflatex` on the source file then includes all of the figures previously generated. The `pst-pdfmk` engine takes care of all of the intermediate processing of the figures as well as the final run(s) of `pdflatex`, etc. To use the engine place the line

```
%%!TEX TS-program = pst-pdfmk
```

at the start of the file and Typeset the file.

#### The `glossary`, `glossaries` and such packages.

Packages that produce multiple and custom indexes, glossaries, etc., use one of two naming schemes for the multiple files they create:

1. The first uses standard extensions but special files names for the generated files. Latexmk can keep track of real changes in and “knows” how to process these files. The `multibib` and `multind` packages are examples that use this method.

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<sup>4</sup>The default processing uses the `epstopdf` command which, in turn, uses `ghostscript`.

2. The second uses the source file name for the file but uses custom extensions to create the files. `Latexmk` needs “help” to know how to process these files in the form of dependencies and rules. Dependencies tell `latexmk` what the input and output extensions are and which rule to use to go from input to output. The `index`, `glossary` and `glossaries` packages are examples that use this second method.

In addition, while the `glossaries` package supersedes the `glossary` package the order of the file extensions created by `acronym` and custom lists, processed by `makeindex` and then read in by subsequent runs of `(xe/pdf)latex` are reversed in the two packages. This latest version of `latexmk` configured for `TEXShop` works correctly for both packages. If you need to create your own custom lists see the examples in the `rc` files for creating dependencies and rules for `latexmk`.

### **What these engines won't do, etc.**

There are many features of `latexmk` that aren't used in these simple engine files. See the documentation for `latexmk` in the supplied full distribution.

In addition, the placement of the `latexmk` program in `~/Library/TeXShop/bin/` is non-standard; that directory is not on the standard path. It is possible to put the program in `/usr/local/bin/` and it will then be usable from the command line. If you install the program there you should modify the engine files to reflect the change in location.

The contents of the `rc` files corresponds to the the settings for commands for `TEXShop` on my system. They are simply text files. Please read the `latexmk` documentation before changing the contents.

Finally, changes in `eps` files *included in figures* created by the `pdftricks` or `pst-pdf` packages are *not* detected by this packaging `latexmk` at this time. I hope correct that problem at a later date.

### **Update for T<sub>E</sub>XShop 2.18 (and later) with MacT<sub>E</sub>X 2008 (ditto).**

The `rc` files for this version of `latexmk` for use with `TEXShop` have been updated to allow use of `synctex`, a `tex`→`pdf` synchronization technology, with `MacTEX-2008` and `TEXShop 2.18`. If you are using `MacTEX-2007` or earlier `TEX` distributions and the inconsequential error message about an unknown option bother you, remove the `-synctex=1` options provided in the supplied `rc` files.

Try it... I hope you like it.

Good Luck,  
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