$\underset{v0.7.2-2014/07/17}{\text{TEXShop Tips \& Tricks}}$

H. Schulz

herbs2@mac.com

Contents

1	Introduction					
	1.1	What Isn't Here	2			
	1.2	What Is Here	2			
2	Edi	Editing, Typesetting and Viewing — the Work Cycle				
	2.1	Editing the Source File	2			
		2.1.1 LATEX & Matrix Panels	2			
		2.1.2 The Tags Popup	3			
		2.1.3 Find/Replace	3			
		2.1.4 Spell Checking	4			
		2.1.5 "Hiding" Index Commands	5			
		2.1.6 Syntax Coloring	5			
	2.2	Typesetting	6			
		2.2.1 Removing "Aux" files	6			
	2.3	Viewing the Output pdf File	6			
		2.3.1 Synchronizing between pdf and Source	7			
	2.4	Working with a Large Document	7			
		2.4.1 Switching between Source Windows	7			
	2.5	Working with BibDesk and Citations	7			
	2.6	Getting Help for Packages	8			
3	Con	ntrolling the Keyboard	8			
	3.1	Menu Shortcuts & System Preferences	8			
	3.2	More Editing Help	8			
	3.3	Key Bindings	9			
4	Mad	cros	9			
	4.1	Text Macros	10			
	4.2	Applescript Macros	10			
5	Con	nmand Completion	11			
	5.1	Completions	11			
	5.2	Substitutions or Abbreviations	11			
	5.3	Hey, it doesn't work!	12			
6	Ext	ending Processing via Engines	12			
	6.1	The ndfl ateymk engine	12			

1 Introduction

TEXShop is a "Front End" for a TEX distribution on Mac OS X. As such it allows the user to create and edit TEX source files, interact with the TEX distribution (e.g., typeset the source file) and finally preview the final pdf file. It also allows the user to go back and forth between preview and source.

Over the years TEXShop has added many features. Some of them are obvious and are meant to help a novice get started. Others are a bit more subtle in their use and the underlying power of these features needs to be coaxed out.

1.1 What Isn't Here

This article is, first of all, *not* about T_EX or L^{*}T_EX. I don't intend to teach you how to write T_EX source. There are many fine books and articles that will teach you how to become a T_EXpert or, at least, a T_EXpätzer like me.

Although there is some introductory material it is also *not* meant as a complete manual for the use of T_EXShop for the total novice. Over time it might evolve into such a document but I've got to start somewhere and this is that start.

1.2 What Is Here

In this article I hope to introduce you to some of the more subtle things you can do to make your life as a TEX source editor easier. These include adding keyboard commands and extending the editing capabilities of TEXShop; helping you make short(er) work of creating documents, etc., with the use of Macros and Command Completion; and, finally, how one can extend the processing capabilities of TEXShop using Engines.

2 Editing, Typesetting and Viewing — the Work Cycle

This is about as close to a beginner's section you will get in this document.

2.1 Editing the Source File

The first thing you've got to do to create that great work is to type it into the source document that will be typeset and viewed later. This involves both putting LETEX markup as well as your wonderful words into the document.

To get started you can open a new document using File → New (Cmd-N) and then fill in the start of a new document by choosing a template from the Templates popup menu in the Source Window or use the File → New From Stationery... command and picking appropriate Stationery from the list. Note that the templates and stationery provided are certainly not complete; if you have some that you think are of general use feel free to submit them for inclusion in TEXShop. You can add personal Templates and Stationery to ~/Library/TeXShop/Templates and ~/Library/TeXShop/Stationery respectively. Note: ~/Library is the Library folder in your HOME folder. Note: Under Mac OS X 10.7 and later the Library folder is "hidden" by default; in Finder hold the Opt key down and click on the Go menu and it will be available.

2.1.1 Language 2.1.1

While I believe that panels with a clickable interface actually hinder learning I'll mention that TeXShop has two panels: one to help with entering Lagarda (the Lagarda) and one for setting

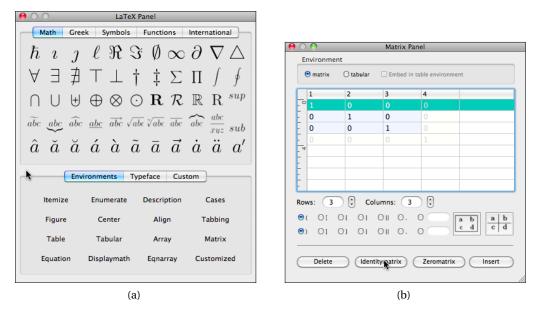


Figure 1: (a) The LTEX Panel; and (b) Matrix Panel.

up the basic structure of a matrix or tabular (the Matrix Panel). These are toggled on/off under the Window Menu or with the keyboard shortcuts¹ Opt-Cmd-- and Opt-Cmd-= respectively. Figure (1) shows what the panels look like.

It is possible to make a few changes and additions to the LTEX Panel by editing the ~/Library/TeXShop/LatexPanel/completion.plist file. **Note: all plist files must be edited using UTF-8 Unicode encoding.**

2.1.2 The Tags Popup

The Tags popup menu on the Source Toolbar will automatically list sectioning commands so you can quickly jump to a relevant part of your document source. You can add your own tag to the list at a particular place in the document by placing the line

%:my tag name

at that position and it will then appear in the popup list so you can jump to that location quickly. See Figure (2). Sorry, tags are not recursively included for files you \include or \input.

2.1.3 Find/Replace

There are three Find/Replace "panels" available with T_EXShop 3.xx (two with T_EXShop 2.xx). Each is discussed individually below. You choose the Find/Replace Panel you wish to use on the Source tab under TeXShop → Preferences. You must restart T_EXShop to enable any changes made to the Find/Replace Panel choice in Preferences.

Apple Find Panel The traditional Apple Fine/Replace panel. A simple to use panel for finding and replacing text. The Standard Apple Find/Replace Panel is shown in Figure (3a) on page 4.

OgreKit Find Panel An advanced Find/Replace panel that supports Regular Expressions (regex for short) of various styles (press the More Options button to select the dialect). Regex is a

 $^{^{}m 1}$ The given shortcuts are for the English localization and may be different with other localizations.

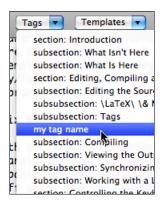


Figure 2: The Tags Popup Menu.

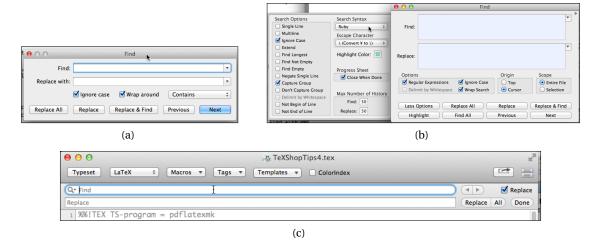


Figure 3: The Find/Replace "panels" available in T_EXShop: (a) the standard Apple Find Panel; (b) the Ogrekit Find Panel with the More Options panel displayed; and, (c) the Apple Find Bar available with T_EXShop 3.xx.

very advanced way to find and replace text and is a good investment of your time to learn. The OgreKit Find Panel with the More Options panel displayed is shown in Figure (3b) on Page 4.

Apple Find Bar Only available in OS X 10.7 and later; and therefore only in T_EXShop 3.xx. It provides a drop down bar for doing Find with an additional line if you select Replace. See Figure (3c) on page 4 for an example of the Apple Find Bar; the additional Replace line is displayed.

2.1.4 Spell Checking

By default TEXShop allows you to use Apple's Spell Checker as built into most applications. Unfortunately that Spell Checker doesn't know anything about LTEX commands so there is a tendency to flag those commands as misspelled word. There are several Spell Check applications that are LTEX-aware with the two most popular being Excalibur (maintained by Rick Zaccone, currently at version 4.07 and installed in /Applications/TeX/Excalibur by the MacTeX install package) and cocoAspell (by Anton Leuski and currently at version 2.1) which installs a Spelling Preference

Pane in System Preferences. More information about these two Spell Checkers is found below.

If you use different dictionaries for different documents (e.g., English or German depending upon the document) you can have TeXShop automatically choose the proper dictionary on a document by document basis by placing a line like

% !TEX spellcheck = English

(for the English (Aspell) dictionary in this case) near the top of each document. Search for 'checking spelling' (without the quotes) in T_EXShop 's $Help \rightarrow TeXShop$ Help Panel... for more detailed information on the designation of a particular dictionary.

Excalibur The Excalibur Spell Checker is a stand-alone application that reads in a Source file, allows you to run a spell check which you then Save as a modified Source file; TeXShop automatically picks up the changes in that Source file. There are several versions of Macros that allow you to run Excalibur from within TeXShop. One by Michael Sharpe (with minor modifications by H. Schulz) can be downloaded from https://dl.dropbox.com/u/10932738/index.html as TeXShopExcaliburMacro.zip. With any of those macros TeXShop automatically picks up the spell checked and saved version of the Source file and *replaces* the old contents of the displayed Source document by the spell checked version; any changes you make to the Source file while Excalibur is still correcting the document *will be lost* so don't do that!

More dictionaries for Excalibur are available at http://excalibur.sourceforge.net>.

cocoAspell The cocoAspell Spell Checker integrates itself into the Apple Spell Check system. After enabling it and choosing the active dictionaries from the installed Spelling Preference Pane in System Preferences you can choose one to use within TEXShop by using Edit → Show Spelling and Grammar (Cmd-:) and choosing an Aspell dictionary.

Information on obtaining and installing more dictionaries for cocoAspell is available at http://people.ict.usc.edu/~leuski/cocoaspell/.

2.1.5 "Hiding" Index Commands

Indexing commands tend to duplicate information that is part of the text and therefore interfere with the process of comprehending the text itself. It is possible to have TeXShop colorize \index commands in a bright yellow. To do that you need to add a 'ColorIndex' checkbox to the Source window's Toolbar. With the Source window active you can either Right-Click (or Ctl-Click) on the Toolbar, choose Customize Toolbar..., or Window \rightarrow Customize Toolbar..., and Drag and Drop the ColorIndex checkbox to a place on the Toolbar. Checking that box will make all \index{text} commands turn a bright yellow, by default, and "recede" into the background; see Figure (4a) on page 6.

2.1.6 Syntax Coloring

TeXShop provides Syntax Coloring for TeX documents as an aid to pick out text versus markup in source documents. To activate the Syntax Coloring make sure that Syntax Coloring is checked in TeXShop \rightarrow Preferences \rightarrow Source \rightarrow Editor. The default color scheme is a bright red for comments, a dark blue for commands and a dark green for "marker" characters ($\{$, $\}$ and \$); see Figure (4a) on page 6. In addition, as noted in section (2.1.5) above, TeXShop offers a special Syntax Coloring for \index commands so that they "recede" into the background and you can more easily read the surrounding text.

You may not like the default Syntax Coloring scheme. Searching for 'syntax colors' (without the quotes) in TeXShop's Help Panel gives information on how to change the colors for comments, commands and "marker" characters. It is also possible to change the color of \index commands

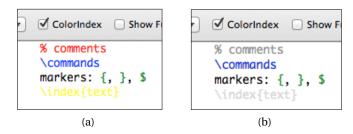


Figure 4: The Default (4a) and an alternate set (4b) of Syntax Colors in T_FXShop.

from the default bright yellow to some other color. The corresponding hidden preference variables are indexred, indexgreen and indexblue. See Figure (4b) on page 6 for an example. (If you like those adjusted syntax colors you can download TeXShopSyntaxColors.zip from https://dl.dropbox.com/u/10932738/index.html. You can also edit those scripts to create colors you prefer.)

2.2 Typesetting

Once you are ready to take a look at how your document will appear you typeset it with the default engine, pdflatex out of the box, by simply using the Typeset \rightarrow Typeset (Cmd-T) command.

You may wish to use a different engine as your default. You can change the default engine in TeXShop \rightarrow Preferences \rightarrow Typesetting.

If you are including many eps graphics files in your document you may wish to typeset using $latex \rightarrow dvips \rightarrow ps2pdf$ since pdf(la)tex does not allow for direct inclusion of eps files². The easiest way to do this is to include the line

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

at the top of your document. Then TEXShop will use the latex+distiller typesetting method noted above no matter what the default engine setting. Change latex to pdflatex to force use of pdflatex to typeset your file.

2.2.1 Removing "Aux" files

The process of typesetting produces several auxiliary files that contain information about cross references, bibliography, indexes, etc. If an error occurs during typesetting these files can be left in some unknown state and need to be removed before attempting to typeset the document again. The File \rightarrow Trash Aux Files (Ctl-Cmd-A) command removes most of the files that may create problems.

With T_EXShop 3.22 and later there is an additional way to remove those files and then typeset the document with a single command. If you hold the Opt key down while clicking the Typeset menu the Typeset \rightarrow Typeset command becomes Typeset \rightarrow Trash Aux & Typeset (Opt-Cmd-T).

Search for trash aux in Help → TeXShop Help Panel... for the list of all file extensions removed by the Trash Aux Files and Trash Aux & Typeset menu commands. The Terminal commands used to add additional extensions to the trash list and return the list to the default list of extensions is also given in that section of T_FXShop's Help Panel.

2.3 Viewing the Output pdf File

Assuming the document was successfully typeset the pdf file will automatically open in a separate preview window.

²The pdflatex program in MacT_FX-2010 and later will do on-the-fly conversion of eps files.

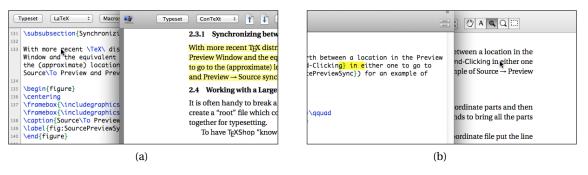


Figure 5: (a) $Source \rightarrow Preview Synchronization$; and (b) $Preview \rightarrow Source Synchronization$.

You can control how it's displayed in the Preview Menu. You can change the default settings in TeXShop \rightarrow Preferences \rightarrow Preview.

2.3.1 Synchronizing between pdf and Source

With more recent T_EX distributions you can also skip back and forth between a location in the Preview Window and the equivalent location in the Source Window by Cmd-Clicking in either one to go to the (approximate) location in the other. See Figure (5) for an example of Source \rightarrow Preview and Preview \rightarrow Source synchronization.

2.4 Working with a Large Document

It is often handy to break a large document into more manageable subordinate parts and then create a "root" file which contains the preamble and \include commands to bring all the parts together for typesetting.

To have T_FXShop "know" which file to typeset when working on a subordinate file put the line

% !TEX root = path/to/rootfile.tex

at the top of your subordinate file; path/to/rootfile.tex is the relative or absolute path to the root file for this document. Once this is done TeXShop will typeset the root file if you press Typeset \rightarrow Typeset (Cmd-T) even though you are editing a subordinate file and properly synchronize between the Source and pdf. E.g., if the root file is called mygreatbook.tex and the chapter files, chapter1.tex, etc., are in a chapters sub-folder below the root file then place the line

% !TEX root = ../mygreatbook.tex

at the top of each of the chapter files. The . . / means go up one folder level to find the root file.

2.4.1 Switching between Source Windows

If you have multiple source files open you can switch between just those windows by using the Window → Next/Previous Source Window (Cmd-F2/Shft-Cmd-F2) menu commands.

2.5 Working with BibDesk and Citations

TEXShop has a built-in "plugin" that interacts with the BibDesk bibliography application to allow you to complete citation references in the \cite command. To enable the use of the "plugin" make sure that TeXShop \rightarrow Preferences \rightarrow Source \rightarrow Editor \rightarrow BibDesk Completions is checked.

To use it you must first open the required bibliography (bib) file(s) in BibDesk. Enter several characters from the reference label within the \cite command and press F5 to get a list of



Figure 6: BibDesk Plugin: (a) citation insertion; and (b) cross-reference insertion.

matching references from the bib file(s) with a bit of information about each one. Scroll to the one you want and press Return or Tab. See Figure (6) on page 8 for an example.

The "plugin" also works for entering cross-references within \ref or \pageref commands but only for those with labels in the file you are editing.

2.6 Getting Help for Packages

There are many times when having help about a given package can be handy. TeXShop has an interface to texdoc which will bring up that documentation. Execute the Help \rightarrow Show Help for Package. . . (Opt-Cmd-I) and enter the name of the package.

You can also easily look at a package directly with the Help \rightarrow Open Style File... command and enter the full package file name *including the proper extension* (e.g., .sty for packages or .cls for document classes).

3 Controlling the Keyboard

One of the best ways to speed up your entry of text in a source file is to keep your hands on the keyboard as much as possible—only one of the reasons I don't like the "clicky" interface of the Lagrange Matrix Panels. There are many shortcuts associated with the Texshop menu system but this section is about changing and adding others and other keyboard customizations.

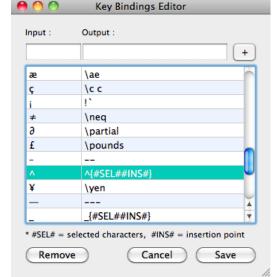
3.1 Menu Shortcuts & System Preferences

Sometimes you'd like to add a shortcut to a menu item that doesn't have one or add one to a command whose shortcut you dislike. Mac OS X 10.4 (Tiger) and later have a method to add shortcuts to specific menu items both globally and in specific programs. This feature has become much more reliable in OS X 10.5 and especially in OS X 10.6 and later.

One example using Mac OS X 10.6 (Snow Leopard) or later: $T_EXShop 2.36$ has added a File \rightarrow New from Stationery... command, without a shortcut, which can be very helpful once you set up stationery the way you want. To add Opt-Cmd-N as the shortcut to that menu item: open up the System Preferences application to Keyboard \rightarrow Keyboard Shortcuts (just Shortcuts in Mavericks) and select Application Shortcuts (App Shortcuts in Mavericks); press the + button to add a shortcut; select T_EXShop as the application; enter the exact menu title [New from Stationery...—note you *must* enter a real ellipsis, '...', (Opt-; with the English keyboard layout)]; and press Opt-Cmd-N as the shortcut.

3.2 More Editing Help

TEXShop is built using Apple's programmers interfaces (called frameworks) and therefore inherits all the properties and functionality of those interfaces. There are many things available through the Text framework that aren't tied to the keyboard by default, e.g., many 'emacs-like' keyboard



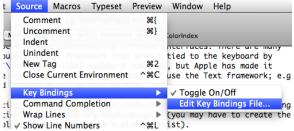


Figure 7: The Key Bindings Menu.

Figure 8: The Key Bindings Editor.

commands, but Apple has made it possible to add those commands to all applications that use the Text framework; e.g., TextEdit and Mail as well as T_FXShop.

This is done by creating a special file, DefaultKeyBinding.dict, and placing it in a particular location, ~/Library/KeyBindings (you may have to create the KeyBindings folder there if it doesn't already exist).

You can get more information about this, as well as a (useful) sample, by downloading the KeyBindings.zip file at https://dl.dropbox.com/u/10932738/index.html.

3.3 Key Bindings

Besides adding shortcuts to Menu Items you can actually bind keystrokes, within T_EXShop , to expand into groups of characters. Checking the $T_EXShop \rightarrow Preferences \rightarrow Source \rightarrow Editor \rightarrow Key$ Bindings option will enable this feature. You can also toggle it on/off for any particular document using $Source \rightarrow Key$ Bindings $\rightarrow Toggle On/Off$. This feature was previously called Auto Completion; not to be confused with Command Completion—see section (5) below.

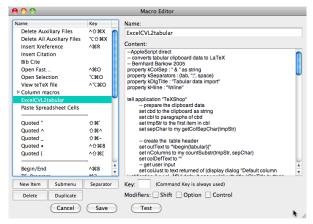
E.g., pressing Opt-, with a US keyboard layout, usually enters \leq into your document but with Key Binding enabled \leq will be entered. Similarly, with some text selected pressing " will surround the selected text with '' and ''.

You can add, remove or change the key bindings using the Key Bindings Editor (Source \rightarrow Key Bindings \rightarrow Edit Key Bindings File. . .). Figures (7) and (8) show the Key Bindings Menu and Editor.

Once in the Editor the left hand column displays the input keystroke while the right hand column shows what will be substituted for that keystroke. To see how you produce some of those keystrokes enable the Keyboard Viewer in System Preferences \rightarrow Keyboard \rightarrow Keyboard by checking the 'Show Keyboard & Character Viewers in menu bar' item and then clicking on the new keyboard icon in your Menu Bar.

4 Macros

Macros can be simple text substitutions or Applescript programs that can do all sorts of processing on a file. You can also assign a keyboard shortcut to any macro for direct execution. The ones that are part of T_FXShop are found under the Macros Menu.



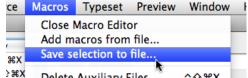


Figure 9: The Macro Editor Window.

Figure 10: The extra menu items when the Macro Editor is open.

You can remove or add additional macros to the menu by using the Macro Editor (use the Macros \rightarrow Open Macro Editor command). The Macro Editor window and extra menu items in the Macros Menu are shown in Figures (9) and (10) respectively.

Besides writing your own macros you can add macros supplied by others to the Macros menu one of two ways: copy and paste the text version of the macro into a New Item in the Macro Editor; or obtain the macro as a plist file and use the Add macros from file... command found in the Macros Menu when the Macro Editor is open (again, see Figure (10)).

More information on macros can be found by searching for macros in Help \rightarrow TeXShop Help Panel. . . .

4.1 Text Macros

Text macros are simple text substitutions. You can also tell TeXShop to insert any selected text using #SEL#, place the cursor using #INS# and even put in multiple lines in the macro itself. Then you can assign the text macro to a keyboard shortcut.

I like to use Cmd-B and Cmd-I to insert $\text{textbf}\{\dots\}$ and $\text{emph}\{\dots\}$ into the document where \dots is any possible selected text. Macros to do that are already under the Macros \rightarrow Text Styles Menu so we need only assign keyboard shortcuts to them. To assign Cmd-I to the emphasize macro: open the Macro Editor where the form of the Macros menu appears in the left hand pane; click the emphasize macro found under Text Styles; click the Key insertion box and simply insert a lower case 'i' (the Cmd key is assumed and additional modifier keys can be checked off).

4.2 Applescript Macros

You cannot distinguish Applescript macros in the Macros Menu from text macros but they can do complicated processing and add/change the source file in TEXShop. One example in the default set is the Program macro that creates a

% !TEX TS-program = xxxx

line at the top of a file with your choice of engine substituted for xxxx. You can look at the Applescript code for this macro by clicking on its name in the Macro Editor.

Some detailed tips on creating Applescript Macros for use in T_EXShop can be found in the $Help \rightarrow Notes$ on Applescript in TeXShop document by Michael Sharpe.

5 Command Completion

Commands that have arguments usually have a Mark (\bullet) inserted for each argument. You move to the next argument by using the Source \rightarrow Command Completion \rightarrow Marks \rightarrow Next Mark command (Ctl-Cmd-F [or Opt-Trigger]). This also selects the Mark so typing automatically removes the Mark and substitutes the typed information. See the complete documentation, with lists of commands/abbreviations supplied with TeXShop out of the box, in the \sim /Library/TeXShop/CommandCompletion folder for much more information.

5.1 Completions

You can complete many commands by starting to type them and pressing the trigger key. Variations on the commands with differing numbers of optional arguments are generated by additional presses of the trigger. One example: typing \sec and then the trigger on a new line produces

```
\section{•}
```

while a second press of the trigger gives

```
\section*{•}
```

the *-variant of the command and a final press of the trigger gives

```
\section[•]{•}
```

with the optional argument.

5.2 Substitutions or Abbreviations

Besides completions for partial command insertions there are also many abbreviations. These are short mnemonics for complete substitutions.

All abbreviations for environments start with a 'b'. To generate a complete itemize environment place \bite on a line by itself and press the trigger key to get

```
\begin{itemize}
\item

•
\end{itemize}•
```

with an extra Mark at the end so you can easily jump to the end of the environment. Additional items can be generated by typing \it and the trigger to get

\item



ready for entry of text.

In addition to the \section command lower level sectioning commands have abbreviations. Sub-sections can be generated by typing \ssec and the trigger to get

```
\subsection{•}
```

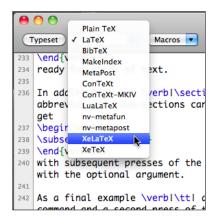


Figure 11: The Engines Popup Menu on the Source Toolbar.

with subsequent presses of the trigger key giving the *-variant and finally the variant with the optional argument.

As a final example \tt and the trigger gives the \texttt{•} command and a second press of the trigger gives the declaration \ttfamily with similar results for other font changing commands.

A set of tables for all the completions and abbreviations supplied with TEXShop can be found in Appendix A on page 13.

5.3 Hey, it doesn't work!

If these examples don't work you probably need to let TEXShop update the ~/Library/TeXShop/CommandCompletion folder; simply delete that folder from ~/Library/TeXShop and restart TEXShop.

6 Extending Processing via Engines

TEXShop offers several default "engines" (also referred to as "scripts" which is left over from earlier times) in its Typeset Menu. These include running Plain TeX or LaTeX (either using pdftex or TeX+DVI), BibTeX, MakeIndex, MetaPost or ConTeXt. But there are many things you may wish to do that fall outside of this limited set so TeXshop also allows you to create new engines that are stored in ~/Library/TeXShop/Engines. These additional engines do not show up in the Typeset menu but only in the popup list on the Source and Preview Toolbar (see Figure (11)).

You can use these engines by choosing from that popup list and then pressing the Typeset button or, a better choice if you use different engines for different documents, by putting a line like

% !TEX TS-program = xelatex

at the top of your source file; the example given will run the xelatex engine on this file independent of other choices.

TeXShop is shipped with a few engines activated (i.e., directly in the ~/Library/TeXShop/Engines folder) but also includes several additional ones in ~/Library/TeXShop/Engines/Inactive. As an example let's activate and use the pdflatexmk engine found in ~/Library/TeXShop/Engines/Inactive/Latexmk.

6.1 The pdflatexmk engine

If your document had cross-references, bibliographies and/or indexes it takes multiple pdflatex runs with intermediate runs of bibtex and/or makeindex to create the bibliographies, indexes and resolve all cross-references. The pdflatexmk engine automates this whole process.

TEXShop 3.07 or 2.46 and later activate the pdflatexmk engine by default *in a fresh installation*. If you are using an earlier version of TEXShop, or even updated to the latest version from an earlier version, you need to activate the engine. To activate the engine simply move the pdflatexmk.engine file from ~/Library/TeXShop/Engines/Inactive/Latexmk two folders up, to ~/Library/TeXShop/Engines. When you restart TEXShop you can check that pdflatexmk is now in the popup menu.

Then place the line

% !TEX TS-program = pdflatexmk

at the top of your source file. From then on when you simply typeset the file (Typeset \rightarrow Typeset or Cmd-T) T_EXShop will use this engine and the complete process for typesetting the document to its final form will be carried out.

Appendices

A — Command Completion Tables

The following tables contain the Command Completions and Abbreviations included by default with TeXShop. Table 1 on page 14 is a list of all included environment abbreviations. Table 2 on page 15 lists included abbreviations/completions for commands and declarations. Finally, Table 3 on page 16 are the included abbreviations for greek letters.

It is important to remember that with a given abbreviation successive presses of the trigger key go to the next match in the list. E.g., there are three sectioning commands, sec for the standard section command, secs for the "starred" version of the command and seco for the version with an optional argument; if you enter sec as your abbreviation successive presses of the trigger goes from the sec to the secs to the seco versions before returning to your original abbreviation. That means there are many abbreviations that you never need to remember.

Note: do *not* attempt to memorize these tables. Learn a few items that you use all the time and then slowly add to your knowledge as you need them.

Table 1: Environment abbreviations.

Abbreviation	Environment	Abbreviation	Environment
barr	array	blett	letter
babs	abstract	blist	list
bali	align	bminp	minipage
balis	align*	bminpo	minipage
baliat	alignat	bmult	multline
baliats	alignat*	bmults	multline*
balied	aligned	bpict	picture
baliedat	alignedat	bpmat	pmatrix
baliedato	alignedat	bquot	quotation
bapp	appendix	bquo	quote
bbmat	bmatrix	bsplit	split
bcase	cases	bsubeq	subequations
bcent	center	btab	tabular
bcenum	compactenum	btabs	tabular*
bcenumo	compactenum	btabx	tabularx
bcitem	compactitem	btabl	table
bcitemo	compactitem	btablo	table
bdes	description	btabls	table*
benu	enumerate	btablso	table*
benuo	enumerate	btbl	table
bequ	equation	btblo	table
bequs	equation*	btbls	table*
beqn	eqnarray	btblso	table*
beqns	eqnarray*	btabb	tabbing
bfig	figure	bbib	thebibliography
bfigo	figure	bindex	theindex
bframe	frame	btheo	theorem
bframeo	frame	btitpg	titlepage
bflalig	flalign	btrivl	trivlist
bflaligs	flalign*	bvarw	varwidth
bfll	flushleft	bverb	verbatim
bflr	flushright	bvers	verse
bgath	gather	bwrap	wrapfigure
bgaths	gather*	bwrapo	wrapfigure
bgathed	gathered	bwrapo2	wrapfigure
bgathedo	gathered	bwrapoo	wrapfigure
bite	itemize		
biteo	itemize		

Table 2: Commands and Declarations.

textemdash midr mathnormal renewcomo renewcommand renewcomo renewcommand renewcomo renewcommand renewcomo renewcommand additocounter mit mathit mewc renewcommand by adden additolength mit mathit mewc renewcommand by the second property of the set of the second property of th	Abbreviation	Command	Abbreviation	Command	Abbreviation	Command
adlen addtolength mtt mathtt mewer renewcommand adeount addtolength mtt mathtt mewer renewcommand before textbf midr mathtt mewer renewcommand before textbf midr mathtt mewer renewcommand biblio bibliographystle bibliographystle bibliographystle bibliographystle bibliographystle bibliographystle bibliographystle bibliem makebox makebox makebox rhoxo raisebox bibitem bibitem mboxo makebox rhoxo raisebox bibitem bibitem makebox makebox rhoxo raisebox bibitem bibitem makebox makebox rhoxo raisebox bibitem bibitem mboxo makebox sec section makebox center centering mboxo makebox sec section makebox center centering mboxo makebox sec section makebox center centering mboxo makebox sec section makebox sec section makebox center centering mboxo makebox sec section makebox sec subsection makebox sec section makebox sec section makebox sec subsection makebox sec section makebox sec subsection mewommand sec subsection section foot foot foot section newcommand sec subsubsection foot foot foot sec sec subsubsection sec subsubsection foot foot sec sec subsubsection sec subsubsection sec subsubsection sec subsubsection sec sec subsubsection sec subsubsection sec subsubsection sec subsubsection sec sec subsubsection sec sec subsubsection sec sec sec subsubsection sec sec sec subsubsection sec sec sec sec subsubsection sec		textendash	midr	midrule	renewcomo	renewcommand
adlen addtolength mit mathit rnewc renewcommand adcount addocounter mit mathit rncmo renewcommand bid textbf mid midrule rnewcoo renewcommand bid biseries mnorm mathnormal rncmoo renewcommand biblio bibliography mdd mdseries rmc rnfamily bibstyle bibliographystyle bott bottomrule makebox makebox rboxo raisebox bibitem bibitem mboxo makebox rboxoo raisebox bibitem bibitem mboxo makebox sec section center centering mboxo makebox sec section center centering mboxo makebox sec section center centering mboxoo makebox sec section center centering mboxo makebox sec section makebox control center centering mboxo makebox sec section section centidro cmidrule ncol space & space & space & space section center centering mboxo makebox sec section section comidro cmidrule ncol space & space sec section subsection center centering mcovo newcommand seco subsection foot footnote ncm newcommand seco subsection foot footnote ncm newcommand seco subsubsection frac frac newco newcommand seco subsubsection frac frac newco newcommand spars subparagraph fboxoo framebox newcoo newcommand spars subparagraph fboxoo framebox newcoo newcommand spars subparagraph fboxoo framebox newco newcolumntype set settlength second s		textemdash	mnorm	mathnormal	renewcomoo	renewcommand
adlen additocounter mit mathit rnewco renewcommand bf textbf mid midrule rncmo renewcommand bfd bfseries mnorm mathormal rncmo renewcommand biblio bibliographystyle mdd mdseries rmc rnfamily botr bottomrule makebox makebox rboxo raisebox bibitem bibitem mboxo makebox rboxoo raisebox bibitem bibitem makebox makebox sec section center centering mboxoo makebox sec section chaper chapter mpar marginpar sec section center center mpar marginpar sec section center center multic multic multic multic cmidro cmidrule ncm newcommand ssec subsection cmidro fem		textemdash w/sp	msf	mathsf	rncm	renewcommand
addoount addrocounter mit mathit rrncmo renewcommand bf textbf midr midrule rrnewcoo renewcommand biblio bibliography mdd mdseries rmc rmfamily bibliste bibliom mbox mbox rbox raisebox bibitem bibitem makebox makebox rboxo raisebox bibitem bibitem mboxo makebox sec section* center centering mboxo makebox sec section* center chapter mpar marginpar sec section* chap chapter mpar marginpar sec section* cmidro cmidrule mulic multicolumn sec subsection* em emph ncm newcommand ssec subsection* em emph ncm newcommand ssec subsection frac frac	adlen	-	mtt	mathtt	rnewc	renewcommand
bfd bíseries midr midrule mewcoo renewcommand bíd bíseries morm mathormal mrcmoo renewcommand bíblio bíbliography mdd mdseries rmc mfamily bibstyle bibliographystyle bott bottomrule mboxo makebox rboxo raisebox bibitem bibitem mboxo makebox rboxoo raisebox bibitem bibitem mboxo makebox sec section center centering mboxo makebox sec section makebox chap chapter mpar marginpar seco section makebox cmidrule cmidrule multic multicolumn ssec subsection em emph ncm newcommand ssec subsection foot footnote ncmo newcommand ssec subsubsection frac frac newco newcommand ssecs subsubsection frac frac newco newcommand ssecs subsubsection frac frac newco newcommand spar subparagraph fboxoo framebox newco newcommand spar subparagraph sparo subparagraph sparo subparagraph sparo newlength set textsf stextsf textsf it text newn newlin newline sc textsc schape includegraphics nenv newenvironment to the text text text text text newno newenvironment to the text text text newno newenvironment to text text text text text text newno newenvironment to the text text text text newno newenvironment to the text text text text text text text	adcount		mit	mathit	rncmo	renewcommand
biblio bibliographystyle bibliographystyle bibliographystyle bibliographystyle bibliographystyle bott bottomrule makebox makebox rboxo raisebox bibitem bibitem mboxo makebox rboxoo raisebox bibitem bibitem mboxo makebox sec section center centering mboxoo makebox sec section section center centering mboxoo makebox sec subsection section center centering mboxoo makebox sec subsection section center centering mboxoo sec section section section section section section section section section foot footnote ncmo newcommand sec subsubsection foot footnote ncmo newcommand sec subsubsection foot footnote ncmo newcommand sec subsubsection section foot footnote ncmo newcommand sec subsubsection foot framebox nct newcolumntype spara subparagraph floxoo framebox nct newcolumntype spara subparagraph sec sec subsubared subsubsection newcolumntype sel setlength hw2tw headw=textw npg newpage stocunt stepcounter hw2tw headw=textw npg newpage sf textsf textsf item item newline sc section newlength sec textsc ite item newlength newlength section sequention newlength set textsf item textit newenvo newenvironment the textit textit textit newenvo newenvironment the textit textit textit itextit newenvo newenvironment the textit tital sishape nenvo newenvironment the textit tital sishape nenvo newenvironment the textit tital sishape nenvo newenvironment to the textit tital sishape nenvo newenvironment to the textit tital sisterities paraboxoo parabox		textbf	midr	midrule	rnewcoo	renewcommand
bibstyle bibliographystyle mbox makebox rbox raisebox bott bottomrule makebox makebox rboxoo raisebox bibitem bibitem mboxo makebox rboxoo raisebox bibitem bibitem mboxo makebox sec section makebox sec subsection makebox makebox sec subsection makebox sec subsubsection foot footnote nemo newcommand sssec subsubsection foot footnote nemo newcommand sssec subsubsection flox flox flox newco newcommand spar subparagraph flox flox flox flox newco newcommand spar subparagraph flox flox flox flox newco newcommand spar subparagraph geometry geometry newct newcolumntype set set subsubsection newcolumntype geometry set newcolumntype set set set set set set set set set se	bfd	bfseries	mnorm	mathnormal	rncmoo	renewcommand
bibstyle bibliographystyle mbox mbox rbox raisebox botr bottomrule makebox makebox rboxo raisebox bibitem bibitem mboxo makebox rboxo raisebox bibitem bibitem makebox makebox sec section center centering mboxo makebox sec section center center center marginpar sec section mid cindrule multic multicolumn sec subsection mid cmidrule neol newcommand ssec subsubsection* mem pmp newcon newcommand spar subsubsection* box fbox </td <td>biblio</td> <td>bibliography</td> <td>mdd</td> <td>mdseries</td> <td>rmc</td> <td>rmfamily</td>	biblio	bibliography	mdd	mdseries	rmc	rmfamily
bibitem bibitem mboxo makebox rboxo raisebox bibitem bibitem mboxo makebox rboxoo raisebox bibitem bibitem makebox makebox sec section makebox sec subsection multic multicolumn sec subsection multicolumn sec subsection multicolumn sec subsection multicolumn sec subsubsection multicolumn sec subsubsection multicolumn sec subsubsection mew command sec subsubsection new command sec subsubsection subsubacetion new command sec subsubsection subsubacetion new command sec subsubsection subsubacetion new co	bibstyle		mbox	mbox	rbox	•
bibitemo bibitem makebox makebox sec section center centering mboxoo makebox secs section chap chapter mpar marginpar seco section cmidro cmidrule multic multicolumn ssec subsection cmidro cmidrule ncol space & space secs subsection em emph ncm newcommand sseco subsection emd em newc newcommand sseco subsection foot footnote ncmo newcommand sssec subsubsection frac frac newco newcommand sssecs subsubsection fbox fbox ncmoo newcommand spar subparagraph fboxo framebox nct newcolumntype sparo subparagraph geometry geometry newct newcolumntype sel setlength hw headwidth newpg newpage st count stepcounter hw2tw headw=textw npg newpage sf textsf sffamily item item newlin newline sc textsc incg includegraphics nenv newenvironment sld sishape nenvo newenvironment to textit textit textit textit newenv newenvironment to textit tit textit newenv newenvironment to textit textit latex LaTeX newenvo newenvironment to text text text flatex lated par paragraph top top rule lettrine lettrine paro paragraph top top rule lettrine lettrine paro paragraph top top rule text parbox parbox tops this pagestyle toc tableofcontents tableofco	•		makebox	makebox	rboxo	raisebox
centercenteringmboxoomakeboxsecssection*chapchaptermparmarginparsecosectioncmidrcmidrulemulticmulticolumnssecsubsectioncmidrocmidrulencolspace & spacessecssubsection*ememphncmnewcommandssecsubsubsection*footfootnotencmonewcommandssecsubsubsection*fracfracnewconewcommandssecsubsubsection*fboxfboxncmoonewcommandsparsubparagraphfboxoframeboxncmoonewcolumntypesparsubparagraph*fboxooframeboxnctnewcolumntypesparsubparagraph*fboxooframeboxnctnewcolumntypesparsubparagraph*hwheadwidthnewpgnewpagest countstepcounterhw2twheadwetextwnpgnewpagesftextsfhrefhrefnlinenewlinesctextsfitoitemnewlinnewlengthsctextsfincgincludegraphicsnewnnewlengthsltextslingincludegraphicsnenvnewenvironmentsqrtsqrtitdtextifnewenvnewenvironmenttttextstlatexLaTeXnewenvnewenvironmenttttexttttlatexLaTeXnewenvonewenvironmenttt<	bibitem	bibitem	mboxo	makebox	rboxoo	raisebox
chap cmidr cmidr cmidrolechapter cmidrule cmidrulemultic multicolumn multicolumn ssec space & space space & space sp	bibitemo	bibitem	makebox	makebox	sec	section
chape cmidr cmidr cmidrochapter cmidrule multic multic multic multic multicolumn sec cmidro cmidro cmidrol midrol em em em em em em h em foot footnote footnote frac frac frac frac frac hbox fbox fbox fbox fbox fbox framebox frac frac frac frac frac frac frac newco newco newcommand newcommand ssec newcommand ssec newcommand ssec subsubsection ssec subsubsection ssec subsubsection ssec subsubsection spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph spar subparagraph subparagraph spar subparagraph subparagraph spar subparagraph subparagraph spar subparagraph subparagraph subparagraph subparagraph subparagraph spar subparagraph <b< td=""><td>center</td><td>centering</td><td>mboxoo</td><td>makebox</td><td>secs</td><td>section*</td></b<>	center	centering	mboxoo	makebox	secs	section*
cmidr cmidrule multic multicolumn ssec subsection cmidro cmidrule ncol space & space secs subsection* em emph ncm newcommand ssecs subsubsection foot footnote ncmo newcommand ssecs subsubsection* frac frac newco newcommand ssecs subsubsection* fbox fbox ncmo newcommand spar subparagraph* fboxo framebox newco newcommand spars subparagraph* fboxo framebox newco newcolumntype set setlength fboxo framebox nct newcolumntype set subparagraph* fboxo framebox newco newcolumntype set setlength hw headwidth newg newcolumntype set seteungth fboxo fbox newentyn newenyage sf textsf	chap	•	mpar	marginpar	seco	section
cmidrocmidrulencolspace & spacessecssubsection*ememphncmnewcommandssecosubsubsection*footfootnotencmonewcommandsssecssubsubsection*fracfracnewconewcommandsssecosubsubsection*fboxfboxncmoonewcommandsparsubparagraphfboxoframeboxnewconewcommandsparssubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraph*hwheadw=textwnewpagestcountstepcounterhw2twheadw=textwnpgnewpagestcountstecounthrefhrefnlinenewpagesftextsfhrefhrefnlinenewlinesfdsffamilyitemitemnewlennewlengthsctextscincgincludegraphicsnewlennewlengthsltextsliftextiltextilslslshapeittextiltextilslslshape<	-		_		ssec	subsection
em emph em newc newcommand ssec subsubsection foot footnote ncmo newcommand ssec subsubsection foot footnote ncmo newcommand ssec subsubsection frac frac newco newcommand ssec subsubsection frac frac newco newcommand ssec subsubsection flox flow framebox ncmoo newcommand spar subparagraph floxoo framebox nct newcolumntype sparo subparagraph geometry geometry newct newcolumntype setl setlength hw headwidth newpg newpage stcount stepcounter hw2tw headwetextw npg newpage stcount stepcounter hw2tw headwetextw npg newpage sf textsf href href nline newline sfd sffamily item item newlin newline sc textsc ito item nlen newlength scd schape includegraphics newlen newenvironment sl textsl listof itshape nenvo newenvironment sqrt sqrt sqrt itd ishape nenvo newenvironment tt textit tatexs LaTeX newenvo newenvironment tt textit tatexe LaTeX newenvo newenvironment tt textit titatexe LaTeX newenvo newenvironment tt textit titatexe LaTeXe newenvo newenvironment tt textit titatitatexe LaTeXe newenvo newenvironment two textwidth latexes LaTeXe pgref pageref tex TeX yep lbl label par paragraph topr toprule lettrine lettrine pgro paragraph topr toprule lettrine lettrine pgro paragraph topr toprule lettrine lettrine paro paragraph topr toprule lettrine rule parboxoo parbox thispagestyle thispagestyle tule rule parboxoo parbox upd upshape mrm mathrm pboxo parbox upd upshape mrm mathrm pboxo parbox usepo usepackage msf mathsf pboxoo parbox usepo usepackage msf mathsf pboxoo parbox usepo usepackage	cmidro	cmidrule	ncol		ssecs	subsection*
emdemnewcnewcommandsssecsubsubsectionfootfootnotencmonewcommandsssecssubsubsection*fracfracnewconewcommandsssecosubsubsectionfboxfboxncmoonewcommandsparsubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraph*geometrygeometrynewctnewcolumntypesetlsetlengthhwheadwidthnewpagnewpagestoountstepcounterhw2twheadw=textwnpgnewpagestoountstepcounterhrefnhrefnlinenewlinesfdsffamilyitemitemnlinenewlinesctextsitoitemnlennewlengthscscshapeincgincludegraphicsnewlennewlengthsltextslincgoincludegraphicsnenvnewenvironmentsqrtsqrtitdtextitnewenvnewenvironmentsqrtsqrtlatexLaTeXnewenvonewenvironmenttttextttlatexsLaTeXnewenvonewenvironmenttttextttlatexeLaTeXenewenvonewenvironmenttttextttlatexeLaTeXenewenvonewenvironmenttttttextttlatexeLaTeXenewenvonewenvironmenttttttextlatexeLaTeXenewenvonewenv	em	emph	ncm		sseco	subsection
fracfracnewconewcommandsssecosubsubsectionfboxfboxncmoonewcommandsparsubparagraphfboxoframeboxnewconewcolumntypesparosubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraphgeometrygeometrynewctnewcolumntypesetlsetlengthhwheadwitchnewpgnewpagesftextsfhrefhrefnlinenewlinesftextsfitemitemnewlinesctextscitoitemnewlinesctextscitoitemnlennewlengthsltextslincgincludegraphicsnenvnewenvironmentsqrtsgrtittextitnewennewenvironmentsqrtsgrtitditshapenenvnewenvironmenttttextttlatexLaTeXnewenvonewenvironmenttttextttlatexsLaTeXenewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmentttdttfamilylatexesLaTeXenewenvonewenvironmentttdttextttlabellabelparparagraphtexsTeXlabellabelparparagraphtexsTeXlettrinelettrinepgspagestyletoctableofcontentslistflistoffablesparboxo<	emd	=	newc	newcommand	sssec	subsubsection
fboxfboxncmoonewcommandsparsubparagraphfboxooframeboxnctnewcolumntypesparosubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraph*geometrygeometrynewctnewcolumntypesetlsetlengthhwheadwatthnewpgnewpagestcountstepcounterhw2twheadwatextwnpgnewpagesftextsfhrefhrefnlinenewlinesfdsffamilyitemitemnewlinnewlinesctextscitoitemnlennewlengthsctextscincgincludegraphicsnewlennewlengthsltextslintditshapenenvonewenvironmentsqrtsqrtittextitnewenvnewenvironmentsqrtsqrtlatexLaTeXnewenvonewenvironmentttttlatexsLaTeXnewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmenttwtext xwistlatexe </td <td>foot</td> <td>footnote</td> <td>ncmo</td> <td>newcommand</td> <td>sssecs</td> <td>subsubsection*</td>	foot	footnote	ncmo	newcommand	sssecs	subsubsection*
fboxoframeboxnewcoonewcommandsparssubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraphgeometrynewctnewcolumntypesetlsetlengthhwheadwidthnewpgnewpagesftextsfhw2twheadw=textwnpgnewpagesftextsfhrefhrefnlinenewlinesctextsfhrefhrefnlinenewlinescschapeitoitemnlennewlengthscscshapeincgincludegraphicsnenvnewengthsltextslingoincludegraphicsnenvnewenvironmentsqrtsqrtittextitnewenvnewenvironmentsqrtsqrtlatexLaTeXnewenvonewenvironmenttttextttlatexLaTeXnewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmentttdttfamilylatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splbllabelparparagraph*tildetextascitildelettrinelettrinepgspagestyletoctableofcontentslistflistoffaguresparboxparboxtpgsthispagestyleruleruleparboxooparboxuptextupmbfmathbf <td< td=""><td>frac</td><td>frac</td><td>newco</td><td>newcommand</td><td>ssseco</td><td>subsubsection</td></td<>	frac	frac	newco	newcommand	ssseco	subsubsection
fboxoframeboxnewcoonewcommandsparssubparagraph*fboxooframeboxnctnewcolumntypesparosubparagraphgeometrynewctnewcolumntypesetlsetlengthhwheadwidthnewpgnewpagesftextsfhw2twheadw=textwnpgnewpagesftextsfhrefhrefnlinenewlinesctextsfhrefhrefnlinenewlinescschapeitoitemnlennewlengthscscshapeincgincludegraphicsnenvnewengthsltextslingoincludegraphicsnenvnewenvironmentsqrtsqrtittextitnewenvnewenvironmentsqrtsqrtlatexLaTeXnewenvonewenvironmenttttextttlatexLaTeXnewenvonewenvironmentttttlatexeLaTeXenewenvonewenvironmentttdttfamilylatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splbllabelparparagraph*tildetextascitildelettrinelettrinepgspagestyletoctableofcontentslistflistoffaguresparboxparboxtpgsthispagestyleruleruleparboxooparboxuptextupmbfmathbf <td< td=""><td>fbox</td><td>fbox</td><td>ncmoo</td><td>newcommand</td><td>spar</td><td>subparagraph</td></td<>	fbox	fbox	ncmoo	newcommand	spar	subparagraph
floxoo framebox nct newcolumntype sparo subparagraph geometry geometry newct newcolumntype setl setlength hw headwidth newpg newpage stcount stepcounter hw2tw headw=textw npg newpage sf textsf href href nline newline sfd sffamily item item newlin newline sc textsc ito item nlen newlength scd scshape includegraphics newlen newlength sl textsl incgo includegraphics nenv newenvironment sqrt sqrt sqrt it textit newenv newenvironment sqrt sqrt sqrt latex LaTeX newenv newenvironment tt textit tatexs LaTeX newenvo newenvironment tt textit titatex LaTeX newenvo newenvironment tt textit titatexe LaTeXe newenvo newenvironment tt textit titatexe LaTeXe newenvo newenvironment twe textwidth latexes LaTeXe newenvo newenvironment twe textwidth latexes LaTeXe pare paragraph texs TeX w/sp lbl label par paragraph texs TeX w/sp lbl label pars paragraph topr toprule lettrine lettrine pgs pagestyle toc tableofcontents listf listoftables parboxo parbox tableofcontents tableofcontents listf listoftables parboxo parbox thispagestyle thispagestyle rule rule parboxoo parbox upd upshape mrm mathrm pboxo parbox usep usepackage msf mathsf pboxoo parbox usep usepackage mft werb verb verb verb verb	fboxo	framebox	newcoo	newcommand	_	
geometry geometry newct newcolumntype setl setlength hw headwidth newpg newpage stcount stepcounter hw2tw headw=textw npg newpage sf textsf href nline newline sfd sffamily item item newlin newline sc textsc ito item nlen newline sc textsc ito item nlen newlength sc sc schape incg includegraphics newlen newenyth sl textsl incgo includegraphics nenv newenvironment sqrt sqrt sqrt it textit newenv newenvironment sqrt sqrt sqrt it textit newenv newenvironment sqrt sqrt sqrt latex LaTeX newenv newenvironment tt textit textit tit textit tit textit newenvironment tt textit textit latexs LaTeX newenvo newenvironment tt textit textit latexe LaTeX newenvo newenvironment tt textit textit latexes LaTeXe newenvo newenvironment tw textwidth latexes LaTeXe pgref pageref tex TeX label label par paragraph texs TeX w/sp lbl label pars paragraph tide textasciitilde lettrine lettrine paro paragraph topr toprule lettrine lettrine pgs pagestyle toc tableofcontents listf listoftables parboxo parbox tableofcontents tableofcontents listf listoftables parboxo parbox tpgs thispagestyle rule rule parboxoo parbox tpgs thispagestyle rule rule parboxoo parbox upd upshape mrm mathrm pboxo parbox usep usepackage msf mathsf pboxoo parbox usep usepackage msf mathst ref ref verb verb verb	fboxoo	framebox	nct	newcolumntype	_	1 0 1
hwheadwidthnewpgnewpagestcountstepcounterhw2twheadw=textwnpgnewpagesftextsfhrefhrefnlinenewlinesfdsffamilyitemitemnewlinnewlinesctextscitoitemnlennewlengthscdscshapeincgincludegraphicsnewlennewlengthsltextslincgoincludegraphicsnenvnewenyironmentsldslshapeittextitnewenvnewenvironmentsqrtsqrtlatexLaTeXnewenvonewenvironmenttttextttlatexLaTeXnewenvonewenvironmentttttlatexsLaTeXev/spnenvoonewenvironmenttwtextwidthlatexesLaTeXenewenvoonewenvironmenttwtextwidthlatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splbllabelparsparagraph*tidetextasciitildelettrinelettrinepgspagestyletoctableofcontentslistflistoffiguresparboxparboxtpgsthispagestyleruleruleparboxooparboxthispagestylethispagestyleruleruleparboxooparboxuptextupmbfmathralpboxooparboxurlurlurl <td>geometry</td> <td>geometry</td> <td>newct</td> <td></td> <td>_</td> <td></td>	geometry	geometry	newct		_	
hw2tw headw=textw npg newpage sf textsf href href nhref nline newline sfd sffamily item item newlin newline sc textsc ito item nlen newlength scd scshape incg includegraphics newlen newlength sl textsl incgo includegraphics nenv newenvironment sld slshape it textit newenv newenvironment sqrt sqrt itd itshape nenvo newenvironment sqrt sqrt latex LaTeX newenvo newenvironment tt texttt latexs LaTeX newenvo newenvironment tt tt tifamily latexe LaTeXev newenvo newenvironment tw textwidth latexes LaTeXev/sp nenvo newenvironment tw textwidth latexes LaTeXew/sp pgref pageref tex TeX label label par paragraph texs TeX w/sp lbl label pars paragraph topr toprule lettrine lettrine paro paragraph toc tableofcontents listf listoffigures parbox parbox tableofcontents listt listoftables parboxoo parbox tpgs thispagestyle rule rule parboxoo parbox upd upshape mrm mathbf pbox parbox usep usepackage msf mathsf pboxoo parbox usepo usepackage mtt mathtt ref ref	•	•	newpg	• •	stcount	•
hrefhrefnlinenewlinesfdsffamilyitemitemnewlinnewlinesctextscitoitemnlennewlengthscdscshapeincgincludegraphicsnewlennewlengthsltextslincgoincludegraphicsnenvnewengthsldslshapeittextitnewenvnewenvironmentsqrtsqrtitditshapenenvonewenvironmentsqrtsqrtlatexLaTeXnewenvonewenvironmenttttextttlatexsLaTeX w/spnenvoonewenvironmenttttextwidthlatexeLaTeXenewenvoonewenvironmenttwtextwidthlatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splbllabelparsparagraph*tildetextasciitildelettrinelettrineparoparagraphtoortableofcontentslistflistoffiguresparboxparboxtableofcontentslisttlistoftablesparboxoparboxthispagestyleruleruleparboxooparboxuptextupmbfmathbfpboxparboxupdupshapemrmmathralpboxooparboxusepusepackagemsfmathstpboxooparboxusepusep	hw2tw	headw=textw			sf	
itoitemnlennewlengthscdscshapeincgincludegraphicsnewlennewlengthsltextslincgoincludegraphicsnenvnewenvironmentsldslshapeittextitnewenvnewenvironmentsqrtsqrtitditshapenenvonewenvironmentsqrtosqrtlatexLaTeXnewenvonewenvironmenttttextttlatexsLaTeX w/spnenvoonewenvironmentttttlatexeLaTeXenewenvoonewenvironmenttwtextwidthlatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splbllabelparsparagraph*tildetextasciitildelettrinelettrineparoparagraphtoprtoprulelettrinelettrinepgspagestyletoctableofcontentslistflistoffiguresparboxparboxtpgsthispagestyleruleruleparboxooparboxtpgsthispagestyleruleruleparboxooparboxuptextupmbfmathbfpboxparboxupdupshapemrmmathcalpboxooparboxusepusepackagemsfmathttrefrefverbverb	href	href			sfd	sffamily
incg includegraphics newlen newlength sl textsl incgo includegraphics nenv newenvironment sld slshape it textit newenv newenvironment sqrt sqrt itd itshape nenvo newenvironment sqrto sqrt latex LaTeX newenvo newenvironment tt texttt latexs LaTeX newenvo newenvironment tt texttt latexe LaTeXe newenvo newenvironment ttw textwidth latexe LaTeXe newenvo newenvironment tw textwidth latexes LaTeXe newenvo newenvironment tw textuty latexes LaTeXe newenvo newenvironment to translate	item	item	newlin	newline	sc	textsc
incgoincludegraphicsnenvnewenvironmentsldslshapeittextitnewenvnewenvironmentsqrtsqrtitditshapenenvonewenvironmentsqrtosqrtlatexLaTeXnewenvonewenvironmenttttextttlatexsLaTeX w/spnenvoonewenvironmentttdttfamilylatexeLaTeXenewenvoonewenvironmenttwtextwidthlatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splb1labelparsparagraph*tildetextasciitildelettrinelettrineparoparagraphtoprtoprulelettrinelettrinepgspagestyletoctableofcontentslistflistoffiguresparboxparboxtableofcontentstableofcontentslisttlistoftablesparboxoparboxthispagestylethispagestyleruleruleparboxooparboxuptextupmbfmathbfpboxparboxurlurlmcalmathcalpboxooparboxusepusepackagemsfmathstpboxoooparboxusepousepackagemttmathttrefrefverbverb	ito	item	nlen	newlength	scd	scshape
incgoincludegraphicsnenvnewenvironmentsldslshapeittextitnewenvnewenvironmentsqrtsqrtitditshapenenvonewenvironmentsqrtosqrtlatexLaTeXnewenvonewenvironmenttttextttlatexsLaTeX w/spnenvoonewenvironmentttdttfamilylatexeLaTeXenewenvoonewenvironmenttwtextwidthlatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splb1labelparsparagraph*tildetextasciitildelettrinelettrineparoparagraphtoprtoprulelettrinelettrinepgspagestyletoctableofcontentslistflistoffiguresparboxparboxtableofcontentstableofcontentslisttlistoftablesparboxoparboxthispagestylethispagestyleruleruleparboxooparboxuptextupmbfmathbfpboxparboxurlurlmcalmathcalpboxooparboxusepusepackagemsfmathstpboxoooparboxusepousepackagemttmathttrefrefverbverb	incg	includegraphics	newlen	newlength	sl	textsl
ittextitnewenvnewenvironmentsqrtsqrtitditshapenenvonewenvironmentsqrtsqrtlatexLaTeXnewenvonewenvironmenttttextttlatexsLaTeXenewenvoonewenvironmentttdttfamilylatexeLaTeXenewenvoonewenvironmenttwtextwidthlatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splbllabelparsparagraph*tildetextasciitildelettrinelettrineparoparagraphtoprtoprulelettrineolettrinepgspagestyletoctableofcontentslistflistoffiguresparboxparboxtableofcontentstableofcontentslisttlistoftablesparboxoparboxthispagestyleruleruleparboxooparboxthispagestyleruleruleparboxooparboxuptextupmbfmathbfpboxparboxurlurlmcalmathcalpboxooparboxusepusepackagemsfmathsfpboxooparboxusepousepackagemttmathttrefrefverbverb	incgo		nenv	newenvironment	sld	slshape
latexLaTeXnewenvonewenvironmenttttextttlatexsLaTeX w/spnenvoonewenvironmentttdttfamilylatexeLaTeXenewenvoonewenvironmenttwtextwidthlatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splbllabelparsparagraph*tildetextasciitildelettrinelettrineparoparagraphtoprtoprulelettrineolettrinepgspagestyletoctableofcontentslistflistoffiguresparboxparboxtableofcontentstableofcontentslisttlistoftablesparboxoparboxthispagestyleruleruleparboxooparboxthispagestyleruleoruleparboxoooparboxuptextupmbfmathbfpboxparboxupdupshapemrmmathcalpboxooparboxusepusepackagemsfmathsfpboxoooparboxusepousepackagemttmathttrefrefverbverb		textit	newenv	newenvironment	sqrt	sqrt
latexsLaTeX w/spnenvoonewenvironmentttdttfamilylatexeLaTeXenewenvoonewenvironmenttwtextwidthlatexesLaTeXe w/sppgrefpagereftexTeXlabellabelparparagraphtexsTeX w/splbllabelparsparagraph*tildetextasciitildelettrinelettrineparoparagraphtoprtoprulelettrineolettrinepgspagestyletoctableofcontentslistflistoffiguresparboxparboxtableofcontentstableofcontentslisttlistoftablesparboxoparboxtpgsthispagestyleruleruleparboxooparboxthispagestylethispagestyleruleoruleparboxoooparboxuptextupmbfmathbfpboxparboxupdupshapemrmmathcalpboxooparboxusepusepackagemsfmathsfpboxoooparboxusepousepackagemttmathttrefrefverbverb	itd	itshape	nenvo	newenvironment	sqrto	
latexe LaTeXe newenvoo newenvironment tw textwidth latexes LaTeXe w/sp pgref pageref tex TeX label label par paragraph texs TeX w/sp lbl label pars paragraph* tilde textasciitilde lettrine lettrine paro paragraph topr toprule lettrineo lettrine pgs pagestyle toc tableofcontents listf listoffigures parbox parbox tableofcontents tableofcontents listt listoftables parboxo parbox tpgs thispagestyle rule rule parboxoo parbox thispagestyle thispagestyle ruleo rule parboxoo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathtt ref ref verb verb	latex	LaTeX	newenvo	newenvironment	tt	texttt
latexes LaTeXe w/sp pgref pageref tex TeX w/sp label label par paragraph texs TeX w/sp lbl label pars paragraph* tilde textasciitilde lettrine lettrine paro paragraph topr toprule lettrineo lettrine pgs pagestyle toc tableofcontents listf listoffigures parbox parbox tableofcontents tableofcontents listt listoftables parboxo parbox tpgs thispagestyle rule rule parboxoo parbox thispagestyle thispagestyle ruleo rule parboxoo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url url mcal mathcal pboxoo parbox usep usepackage msf mathtt ref ref verb verb	latexs	LaTeX w/sp	nenvoo	newenvironment	ttd	ttfamily
label label par paragraph texs TeX w/sp lbl label pars paragraph* tilde textasciitilde lettrine lettrine paro paragraph topr toprule lettrineo lettrine pgs pagestyle toc tableofcontents listf listoffigures parbox parbox tableofcontents tableofcontents listt listoftables parboxo parbox tpgs thispagestyle rule rule parboxoo parbox thispagestyle thispagestyle ruleo rule parboxoo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt mathtt ref ref verb verb	latexe	LaTeXe	newenvoo	newenvironment	tw	textwidth
lbl label pars paragraph* tilde textasciitilde lettrine lettrine paro paragraph topr toprule lettrineo lettrine pgs pagestyle toc tableofcontents listf listoffigures parbox parbox tableofcontents tableofcontents listt listoftables parboxo parbox tpgs thispagestyle rule rule parboxoo parbox thispagestyle thispagestyle ruleo rule parboxoo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathbf ref ref verb verb	latexes	LaTeXe w/sp	pgref	pageref	tex	TeX
lettrine lettrine paro paragraph topr toprule lettrineo lettrine pgs pagestyle toc tableofcontents listf listoffigures parbox parbox tableofcontents tableofcontents listt listoftables parboxo parbox tpgs thispagestyle rule rule parboxoo parbox thispagestyle thispagestyle ruleo rule parboxooo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url url mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt ref ref verb verb	label	label	par	paragraph	texs	TeX w/sp
lettrineolettrinepgspagestyletoctableofcontentslistflistoffiguresparboxparboxtableofcontentslisttlistoftablesparboxoparboxtpgsthispagestyleruleruleparboxooparboxthispagestylethispagestyleruleoruleparboxoooparboxuptextupmbfmathbfpboxparboxupdupshapemrmmathrmpboxoparboxurlurlmcalmathcalpboxooparboxusepusepackagemsfmathsfpboxoooparboxusepousepackagemttmathttrefrefverbverb	lbl	label	pars	paragraph*	tilde	textasciitilde
listf listoffigures parbox parbox tableofcontents tableofcontents listt listoftables parboxo parbox tpgs thispagestyle rule rule parboxoo parbox thispagestyle thispagestyle ruleo rule parboxooo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt mathtt ref ref verb verb	lettrine	lettrine	paro	paragraph	topr	toprule
listt listoftables parboxo parbox tpgs thispagestyle rule rule parboxoo parbox thispagestyle thispagestyle ruleo rule parboxooo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt mathtt ref ref verb verb	lettrineo	lettrine	pgs	pagestyle	toc	tableofcontents
rule rule parboxoo parbox thispagestyle thispagestyle ruleo rule parboxooo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt mathtt ref ref verb verb	listf	listoffigures	parbox	parbox	tableofcontents	tableofcontents
ruleo rule parboxooo parbox up textup mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt mathtt ref ref verb verb	listt	listoftables	parboxo	parbox	tpgs	thispagestyle
mbf mathbf pbox parbox upd upshape mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt mathtt ref ref verb verb	rule	rule	parboxoo	parbox	thispagestyle	thispagestyle
mrm mathrm pboxo parbox url url mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt ref ref verb verb	ruleo	rule	parboxooo	parbox	up	textup
mcal mathcal pboxoo parbox usep usepackage msf mathsf pboxooo parbox usepo usepackage mtt mathtt ref ref verb verb	mbf	mathbf	pbox	parbox	upd	upshape
msf mathsf pboxooo parbox usepo usepackage mtt ref ref verb verb	mrm	mathrm	pboxo	parbox	url	url
mtt mathtt ref ref verb verb	mcal	mathcal	pboxoo	parbox	usep	usepackage
	msf	mathsf	pboxooo	parbox	usepo	usepackage
mit mathit renewcom renewcommand verb2 verb	mtt	mathtt	ref	ref	verb	verb
	mit	mathit	renewcom	renewcommand	verb2	verb

Table 3: Greek Letters. The 'd' versions are not shown.

Abbreviation	Command	Abbreviation	Command
xa	alpha	xvp	varpi
xb	beta	xph	phi
xch	chi	xcph	Phi
xd	delta	xvph	varphi
xcd	Delta	xps	psi
xe	epsilon	xcps	Psi
xve	varepsilon	xs	sigma
xet	eta	xcs	Sigma
xg	gamma	XVS	varsigma
xcg	Gamma	XZ	zeta
xio	iota	xr	rho
xk	kappa	xvr	varrho
xl	lambda	xt	tau
xcl	Lambda	xth	theta
xm	mu	xcth	Theta
xn	nu	xvth	vartheta
XO	omega	xu	upsilon
xco	Omega	xcu	Upsilon
xp	pi	XX	xi
хср	Pi	XCX	Xi