

Using L^AT_EX
Rensselaer at Hartford

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\LaTeX runs on a variety of computers at many different sites. This document tells you how to use \LaTeX on Rensselaer at Hartford Unix sites running the standardly distributed Unix version of \TeX and \LaTeX . It is not about \LaTeX itself, which is described in the manual— *\LaTeX : A Document Preparation System*, available from Addison-Wesley (ISBN 0-201-15790-X).

If you have a question that you can't answer by reading the manual and this document, ask Technical and Information Services Staff. They should also be informed of any possible \LaTeX bugs or undocumented anomalies.

1 Getting Started

1.1 Running a Sample File

Before preparing your own documents, you may want to get acquainted with \LaTeX by running it on a sample input file. First make your own copy of the file `sample.tex` by typing the following Unix command:

```
cp /home/common/tutorials/latex/sample.tex .
```

(You must type the space followed by the period at the end. This and all other Unix commands are ended by typing *return*.) A copy of the file `sample.tex` is now in your current directory; you can edit it just like any other file. If you destroy or mess up your copy, typing the above command again gets you a fresh one.

Next, run \LaTeX on the file `sample.tex` by typing:

```
latex sample
```

When \LaTeX has finished, it will have produced the file `sample.dvi` in your directory. You can print this file by typing the command:

```
dvips [-Pprinter] sample.dvi
```

The output will be produced on your site's local postscript printer. The “-P” and printer arguments are optional. After it has been printed, you can delete `sample.dvi` by typing

```
rm sample.dvi
```

\LaTeX users can use the `dviselect` command on the file `sample.tex` by typing:

```
dviselect -i sample.dvi -o outfile.dvi firstpage:lastpage
```

For example, if you have a 6 page \LaTeX dvi file called `paper.dvi`, a two page dvi file, `temp.dvi`, consisting of only the third and fourth pages can be created using the following command:

```
dviselect -i paper.dvi -o temp.dvi 3:4
```

The `temp.dvi` file can be printed on the laser printer using the standard `dvips` command. See the *dviselect* manual page for further details.

1.2 Preparing and Running L^AT_EX on Your Own Files

You must use a text editor to prepare an input file for L^AT_EX. Contact your computer's administrator for more information on the text editors available to you. The easiest way to start learning about L^AT_EX is by examining the file `small.tex` with your text editor. You can obtain your own copy of this file, in your directory, by typing the command

```
cp /home/common/tutorials/latex/small.tex .
```

After you have prepared your file, whose name should have the extension `tex`, you must run it through L^AT_EX and print the output. Follow the instructions in Section 1.1, except substitute the first name of your file for “`sample`”. Remember to save disk space by deleting the `dvi` file after printing the output.

When running L^AT_EX on your own file you will probably get error messages ending with a `?`.

Some of your options are:

<code><return></code>	To continue past this error.
<code>i <command> <return></code>	To replace bad or misspelled command in your text with another.
<code>e</code>	To get directly into the <code>vi</code> editor at the place where the error is.
<code>h</code>	For help messages.
<code>x</code>	To exit.

T_EX may write an `*` and stop without any error message. This is probably due to a missing `\end{document}` command, but other errors can cause it. Type `\stop <return>` to continue.

If you want to stop L^AT_EX in the middle of its execution, perhaps because it is printing a seemingly unending string of uninformative error messages, type *Control-C* (press `C` while holding down the key labeled *CTRL*). This will make L^AT_EX stop as if it had encountered an ordinary error, and you can return to Unix command level by typing `x`, as described in the manual. If typing *Control-C* doesn't work, typing *Control-Z* will get you immediately to Unix command level, but this will leave a stopped job hanging around. A stopped job won't hurt anything and will usually disappear when you log out, but it forces you to type two successive `logout` commands to log out.

To use the *spell* program for finding spelling errors in a L^AT_EX input file named `myfile.tex`, type the following command:

```
detex myfile.tex | spell
```

This will type a list of possibly misspelled words on your terminal. If you'd rather have the output written to a file named `foo.bar`, type

```
detex myfile.tex | spell >foo.bar
```

1.3 Previewing L^AT_EX Documents

L^AT_EX documents may be previewed on the Sun workstations by using the following command.

1.3.1 xdvi

Under *X* or *OpenWindows* environments use *xdvi* command by typing:

```
xdvi myfile.dvi
```

See the *xdvi* manual page for more information.

2 Carrying On

2.1 L^AT_EX on Unix

The only special problems in using L^AT_EX caused by the Unix operating system involve the way Unix handles files. The first problem arises because, when a program starts to write a file, Unix destroys the previous version of that file. Thus, if an error forces you to stop L^AT_EX prematurely (by typing *Control-C* or *Control-Z*), then the files that L^AT_EX was writing are incomplete, and the previous complete versions have been destroyed. You probably don't care about the output on the *dvi* file, but, if you are making a table of contents or using cross-referencing commands, then L^AT_EX also writes one or more *auxiliary files* that it reads the next time it processes the same input file. If the auxiliary files are incomplete because L^AT_EX was stopped before reaching the end of its input file, then the table of contents and cross-references will be incorrect the next time L^AT_EX is run on the same input file. You will have to run L^AT_EX a second time to get them right. If you want to avoid having to run L^AT_EX twice after making an error—for example, if your input is very long—then you should save copies of these auxiliary files before running L^AT_EX. An input file named `myfile.tex` and all the auxiliary files produced by L^AT_EX from it are included in the Unix file specifier `myfile.*`. Use the Unix `cp` command to save copies of these files.

The second problem in using L^AT_EX on Unix involves the files that L^AT_EX reads. The file whose name you type with Unix's `latex` command is called the *root file*. In addition to reading the root file, L^AT_EX also reads the files specified

by `\input` and `\include` commands. With the Unix directory system, \LaTeX must know not only the names of these file but also on what directories they are. It will have no problem finding the correct files if you follow two simple rules:

1. Run \LaTeX from the directory containing the root file.
2. Keep all files specified by `\input` and `\include` commands in the same directory as the root file.

If you follow these rules, you never have to type an Unix path specifier when using \LaTeX .

You should never break the first rule, otherwise \LaTeX will have trouble finding auxiliary files. (To run \LaTeX on someone else's file, copy the file to your directory.) If you break the second rule, specifying a file from another directory in an `\input` or `\include` command, you must use a complete path name. For example, to include the file `hisfile.tex` from Jones' directory `/foo/bar`, you can type

```
\include{/udir/jones/foo/bar/hisfile}
```

A `~` character may not appear in the argument of an `\input` or `\include` command, so you *can't* use a file name such as `~jones/foo/bar/hisfile`.

For people who don't like to obey rules, here is exactly how \LaTeX finds its files. The root file is found by Unix according to its usual rules. \LaTeX 's auxiliary files are read and written in the directory from which it is run. All file names specified in the \LaTeX input, including the names of document-style (`sty`) files specified by the `\documentstyle` command, are interpreted relative to the directory from which \LaTeX is run. If \LaTeX does not find a file starting in this directory, it looks in the system directory `/usr/local/lib/tex/inputs`. You can change the directories in which \LaTeX looks for its input files by setting the environment variable `TEXINPUTS`. Putting the command

```
setenv TEXINPUTS ../udir/jones/myown:/usr/local/tex/macros:
```

in your `.login` file causes \LaTeX to look for files first in the current directory, then in Jones' `/myown` directory, and then in the system directory. You might want to do this if your name is Jones and you have your own personal document-style files in your `/myown` directory.

2.2 Document Styles

2.2.1 Special Styles

The only document styles or style options currently available here that are not described in the manual are the `proc` and the `galley` style options for making camera-ready copy for conference proceedings.

2.2.2 The proc Style Option

The `proc` option is used with the `article` document style. It produces two-column output for ACM and IEEE conference proceedings. The command `\copyrightspace` makes the blank space at the bottom of the first column of the first page, where the proceedings editor will insert a copyright notice. This command works by producing a blank footnote, so it is placed in the text of the first column. It must go after any `\footnote` command that generates a footnote in that column.

L^AT_EX automatically numbers the output pages. It's a good idea to identify the paper on each page of output. Placing the command

```
\markright{Jones---Foo}
```

in the preamble (before the `\begin{document}` command) prints “Jones—Foo” at the bottom of each page.

2.2.3 The galley Style Option

The `galley` option is used with the `article` document style. It produces two-column output for Rensselaer at Hartford Computer Science Conference Proceedings.

A sample document, `galley.tex`, can be copied to your directory by typing the following command:

```
cp /home/common/tutorials/latex/galley.tex .
```

You can run L^AT_EX on `galley.tex` in the usual way.

2.3 Where the Files Are

All L^AT_EX files mentioned in the manual, including the `sty` and `doc` files, are in the directory `/apps/net/tex/inputs`. Fonts are stored in `/apps/net/tex/fonts`. The `*.tfm` files are used by T_EX and L^AT_EX. The `*.pk` files are pixel files used by *pstex* and other device drivers.

2.4 Running `lablst.tex` and `idx.tex`

A list of labels and citations in an input file is printed by running L^AT_EX on the input file `lablst.tex`, which is done by typing

```
latex lablst
```

L^AT_EX will then ask for the name of the input file, which should be typed without an extension, and for the name of the main document style (e.g., `article`), used by that file.

The index entries on an `idx` file are printed by running L^AT_EX on the file `idx.tex`, which is done by typing

latex idx

L^AT_EX will ask for the name of the `idx` file, which is typed without an extension.

2.5 Differences from the Manual

All L^AT_EX features described in the manual are provided by the Unix implementation.

2.6 Fonts

Almost all the symbols available on our fonts can be generated by ordinary L^AT_EX commands. However, there are type sizes not obtainable by L^AT_EX's size-changing commands with the ordinary document styles. Consult a local T_EX expert to find the T_EX name for such a font.

Tables 1 and 2 allow you to determine if the font for a type style at a particular size is preloaded, loaded on demand, or unavailable. Table 1 tells you what size of type is used for each L^AT_EX type-size command in the various document-style options. For example, with the 12pt option, the `\large` declaration causes L^AT_EX to use 14pt type. Table 2 tells, for every type size, to which class of fonts each type style belongs. For example, in 14pt type, `\bf` uses a preloaded font and the other five type-style commands use load-on-demand fonts. Roman (`\rm`) and math italic (`\mit`) fonts are all preloaded; the `\em` declaration uses either italic (`\it`) or roman.

2.7 Special Versions

No foreign-language or other special versions of L^AT_EX are currently available at Rensselaer at Hartford.

size	default (10pt)	11pt option	12pt option
<code>\tiny</code>	5pt	6pt	6pt
<code>\scriptsize</code>	7pt	8pt	8pt
<code>\normalsize</code>	10pt	11pt	12pt
<code>\large</code>	12pt	12pt	14pt
<code>\Large</code>	14pt	14pt	17pt
<code>\LARGE</code>	17pt	17pt	20pt
<code>\huge</code>	20pt	20pt	25pt
<code>\Huge</code>	25pt	25pt	25pt

Table 1: Type sizes for L^AT_EX size-changing commands.

	<code>\it</code>	<code>\bf</code>	<code>\sl</code>	<code>\sf</code>	<code>\sc</code>	<code>\tt</code>
5pt	D	D	X	X	X	X
6pt	X	D	X	X	X	X
7pt	P	D	X	X	X	X
8pt	P	D	D	D	D	D
9pt	P	P	D	D	D	P
10pt	P	P	P	P	D	P
11pt	P	P	P	P	D	P
12pt	P	P	P	P	D	P
14pt	D	P	D	D	D	D
17pt	D	P	D	D	D	D
20pt	D	D	D	D	D	D
25pt	X	D	X	X	X	X

Table 2: Font classes: P = preloaded, D = loaded on demand, X = unavailable.