

T_EX Live CD-ROM

The T_EX Live Guide, version 2

Sebastian Rahtz and Michel Goossens

Contents

| | | |
|----------|---|------------|
| 1 | Introduction | 81 |
| 1.1 | History and acknowledgements | 81 |
| 1.2 | Future versions | 82 |
| 2 | Structure and contents of the CD-ROM | 82 |
| 2.1 | The TDS tree | 82 |
| 3 | Installation and use under Unix | 83 |
| 3.1 | Running T _E X Live from the CD-ROM | 83 |
| 3.2 | Installing T _E X Live to a hard disk | 84 |
| 3.3 | Installing individual packages from T _E X Live to a hard disk | 84 |
| 3.4 | texconfig | 86 |
| 3.5 | Building on a new platform | 86 |
| 4 | A user's guide to the Web2c system | 86 |
| 4.1 | Kpathsea path searching | 87 |
| 4.2 | Filename databases | 89 |
| 4.3 | Runtime options | 93 |
| 5 | Other packages on the CD-ROM | 93 |
| 5.1 | OzT _E X | 93 |
| 5.2 | CMacTeX | 94 |
| 5.3 | MikTeX | 94 |
| 5.4 | emTeX | 94 |
| A | The texmf.cnf file | 95 |
| B | Catalogue of Packages | 101 |

- - * - -

1 Introduction

This documentation describes the main features of the T_EX Live CD-ROM, a T_EX/L^AT_EX distribution for Unix, Windows32, Amiga and NeXT systems, that includes T_EX, L^AT_EX 2_ε, METAFONT, MetaPost, many other programs such as Makeindex, dvips, xdvi and BIBT_EX; and a very complete set of macros, fonts and documentation conforming to the *T_EX Directory Standard* which can be used with nearly every T_EX setup.

This T_EX package uses the Web2c implementation of the programs, which tries to make T_EXing as easy as possible, and takes full advantage of the efficient and highly customizable Kpathsea library from Karl Berry. It can be run either directly from the CD-ROM, or installed on a hard disk.

The T_EX Live runnable systems contain two experimental extensions to normal T_EX:

1. ϵ -T_EX, which adds a small but powerful set of new primitives, and the T_EX--X_EL extensions for left to right typesetting; in default mode, ϵ -T_EX is 100% compatible with ordinary T_EX. See `share/texmf/doc/html/e-tex/etex.htm` on the CD-ROM for details.
2. pdfT_EX, which can optionally write Acrobat PDF format instead of dvi; there is no formal documentation for this yet, but the file `share/texmf/tex/pdftex/example.tex` shows how it is used. The L^AT_EX `hyperref` package has an option 'pdftex' which turns on all the program features.

While ϵ -T_EX is stable, pdfT_EX is under continual development; the version on the CD-ROM may not be stable. Most platforms have version 0.11 of May 7th, but some have a slightly earlier one of May 5th, which may have problems including PNG files.

The entire GUTenberg distribution for Windows is included on the CD-ROM, ready to install, as are the following complete packages:

- OzT_EX 3.0 for Macintosh
- CMacTeX 2.6 for Macintosh
- Macintosh utilities (Alpha, Excalibur, etc.)
- MikTeX for Windows 95
- emTeX for MSDOS and OS/2
- T_EX shells for Windows and DOS (Winedt, e4t, TeXtelnExtel, emTeXgi)

These are provided unchanged from CTAN, and have not been integrated in any way with the rest of the CD-ROM.

1.1 History and acknowledgements

This CD-ROM distribution is a joint effort by the T_EX Users Group, the UK T_EX Users Group, and the French T_EX Users (GUTenberg), with the support of the Dutch, German and Czech/Slovak user groups. Discussion began in late 1993 when the Dutch T_EX Users Group was starting work on its 4AllT_EX CD-ROM for MSDOS users, and it was hoped at that time to issue a single, rational, CD-ROM for all systems. This was far too ambitious a target, but it did spawn not only the very successful 4AllT_EX CD-ROM, but also the TUG Technical Council working group on a *T_EX Directory Structure*, which specified how to create consistent and manageable collections of T_EX support files. The final draft of the TDS was published in the

December 1995 issue of *TUGboat*, and it was clear from an early stage that one desirable product would be a model structure on CD-ROM. The CD-ROM you now have is a very direct result of the working group's deliberations. It was also clear that the success of the 4AllTeX CD-ROM meant that Unix users would benefit from a similarly easy system, and this is the other main strand of **TeX Live**.

We undertook to make a new Unix-based TDS CD-ROM in the autumn of 1995, and quickly identified Thomas Esser's teTeX as the ideal setup, as it already had multi-platform support and was built with portability across file systems in mind. Thomas agreed to help, and work began seriously at the start of 1996. The first edition was released in May 1996. At the start of 1997, Karl Berry completed a major new release of his Web2c package, which included nearly all the features which Thomas Esser had added in teTeX, and we decided to base the 2nd edition of the CD-ROM on the standard Web2c, with the addition of teTeX's `texconfig` script.

We are particularly grateful to: Karl Berry for extra advice, encouragement, and (of course) for providing the Web2c distribution; Thomas Esser, without whose marvellous teTeX package this CD-ROM would certainly not exist, and whose continual help makes it a better product; and Ulrik Vieth, for checking many assumptions at the start, and providing a great deal of extra material for the documentation tree.

Fabrice Popineau did the excellent port of Web2c 7.0 to Windows 95/NT and provided much help; Andreas Scherer contributed the Amiga compilation; Gregor Hoffleit contributed the TeXview material for NextStep users, and the NextStep binaries. At Florida State University Supercomputer Research Institute, Mimi Burbank arranged access to a slew of different computers to compile TeX on, and acted as an essential guinea-pig whenever asked. Michel Goossens provided access to computers at CERN, and Robin Fairbairns stepped in to provide an Alpha running Linux at Cambridge.

Some of this documentation is drawn from the teTeX guide by Thomas Esser and Dirk Hillbrecht; the catalogue of packages depends very much on the ongoing work of Graham Williams (<mailto:Graham.Williams@cbr.dit.csiro.au>), who kindly agreed to allow us to use it here. Mimi Burbank, Robin Fairbairns and Ulrik Vieth worked hard to improve this text.

1.2 Future versions

This CD-ROM is not a perfect product! We plan to re-issue it once a year, and would like to provide

more help material, more utilities, more installation programs, and (of course) an ever-improved and checked tree of macros and fonts. This work is all done by hard-pressed volunteers in their limited spare time, and a great deal remains to be done. If you can help, don't hesitate to put your name forward!

Corrections, suggestions and additions for future revisions should be sent to:

Sebastian Rahtz
7 Stratfield Road
Oxford OX2 7BG
United Kingdom
<mailto:s.rahtz@elsevier.co.uk>

Updates, notes, and suggestions will be made available on CTAN in `info/texlive`. A WWW page for information and ordering details is at <http://www.tug.org/tex-live.html>.

2 Structure and contents of the CD-ROM

The CD-ROM top level directories are:

- bin** The TeX family programs, arranged in separate platform directories;
- info** Documentation in GNU 'info' format for the TeX system;
- macintosh** The OzTeX and CMacTeX packages ready to install, plus some other utilities;
- man** Documentation in Unix man pages for the TeX system;
- msdos** DOS TeX packages — emTeX, and three TeX shells;
- support** The source of all programs, including the main Web2c TeX and METAFONT distribution; this directory also includes various bits of TeX-related software which are *not* installed by default, such as MusixTeX support programs, and a complete set of Ghostscript;
- share** The main support tree of macros, fonts and documentation;
- wingut** The GUTenberg distribution for Windows; this consists of compressed archives which must be unpacked and installed on a hard disk. Please see the detailed instructions in French;
- win32** TeX packages for Windows 95 and NT users (MikTeX, and the original package of the Win32 port of Web2c).

There are also two installation scripts for Unix systems, `install-cd.sh` and `install-pkg.sh`; we discuss them on p. 83.

2.1 The TDS tree

The **TeX Live** `share/texmf` tree consists of various 'collections', each of which has a set of 'packages', of

which there are over 400 on the CD-ROM. Normal installation allows the user to copy all of a collection to a local hard disk from the CD-ROM, but it is also possible to install just one package of a collection. Each of the collections is divided into *basic* (1), *recommended* (2) and *other* (3). The collections are:

ams The American Mathematical Society macro packages and fonts

bibtex BIB \TeX styles and databases

doc General guides and documentation in various formats, including HTML and PDF

dvips Support for Rokicki's dvi to PostScript driver

fonts Font sources, metrics, PostScript and bitmap forms

formats Eplain, Rev \TeX , physxx, texsis, alateX, text1, lollipop, etc.

generic Extra macros for use with any format

graphics Macro packages for graphics

lang Support for non-English languages

latex L \TeX , including official tools and all L \TeX 2 ϵ contributed packages

metapost Support for MetaPost

plain Macros for plain \TeX

systems Binaries for Unix platforms

texlive Basic material for the distribution

The appendix starting on p. 101 lists all the packages in alphabetical order with the collection they are found in, and a brief description. Thus all packages in collection `latex1` are what one must have to get started with L \TeX , packages in `latex2` are recommended for most users, and `latex3` contains optional packages. The directory `share/texmf/lists` contains lists of all files in each package (used by the installation package).

3 Installation and use under Unix

You can use the **\TeX Live** CD-ROM in three ways:

1. You can mount the CD-ROM on your file system, adjust your `PATH`, and run everything off the CD-ROM; this takes very little disk space, and gives you immediate access to everything on the CD-ROM; although the performance will not be optimal, it is perfectly acceptable on, for instance, PCs running Linux;
2. You can install all or part of the system to your local hard disk; this is the best method for many people, if they have enough disk space to spare (a minimum of about 10 megabytes, or 100 megabytes for a recommended good-sized system);

3. You can install selected packages to work either with your existing \TeX system or a **\TeX Live** system you installed earlier.

Each of these methods is described in more detail in the following sections.

Warning: This CD-ROM is in ISO 9660 (High Sierra) format, with Rock Ridge extensions. In order to take full advantage of the CD-ROM on a Unix system, your system needs to be able to use the Rock Ridge extensions. Please consult the documentation for your `mount` command to see if it is possible. If you have several different machines on a local network, see if you can mount the CD-ROM on one which *does* support Rock Ridge, and use it from the others.

Linux, FreeBSD, Sun, SGI and DEC Alpha systems should be able to use the CD-ROM with no problems. We would appreciate receiving detailed advice from other system users who also succeed, for future versions of this documentation.

The discussion below about installation assumes you have been able to mount the CD-ROM with full Rock Ridge compatibility.

3.1 Running \TeX Live from the CD-ROM

The organisation of Web2c means that you can run programs simply by adding the appropriate directory under `bin` on the CD-ROM to your `PATH`, and the support files will all be found with no further ado. The following table shows the list of available directories and the systems they apply to.

| | |
|------------------|------------------------------|
| alpha-linux | DEC Alpha Linux |
| alpha-osf3.2 | DEC Alpha OS 3.2 |
| amiweb2c | Amiga |
| hppa11-hpux9.05 | HP9000 HPUX 9.05 |
| hppa11-hpux10.20 | HP9000 HPUX 10.20 |
| i386-linux | Intel PC with Linux (ELF) |
| i586-freebsd2.2 | Intel PC with Free BSD |
| i686-linux | Intel Pentium Pro with Linux |
| mab-nextstep3 | NextStep 3 |
| mips-irix4.0.5 | SGI IRIX 4.0.5 |
| mips-irix5.3 | SGI IRIX 5.3 |
| mips-irix6.3 | SGI IRIX 6.3 |
| mips-ultrix4.4 | DECstation Ultrix 4.4 |
| rs6000-aix3.2.5 | IBM RS 6000 AIX 3.2.5 |
| rs6000-aix4.1.1 | IBM RS 6000 AIX 4.1.1 |
| sparc-sunos4.1.3 | Sun Sparc Sunos 4.1.3 |
| sparc-solaris2.5 | Sun Sparc Solaris 2.5 |
| sparc-solaris2.4 | Sun Sparc Solaris 2.4 |
| sparc-linux | Sun Sparc Linux |
| win32 | Windows 95 or NT |

You may worry that when you subsequently make fonts or change configuration, things will go wrong because you cannot change files on the CD-ROM. However, you can maintain a parallel, writeable, \TeX tree on your hard disk; this is searched before the main tree on the CD-ROM. The default location is `/usr/local/texmf`, but you can override this by setting the `TEXMFLOCAL` environment variable.

Thus *sh* or *bash* users on an Intel PC running Linux who mount the \TeX Live CD-ROM on `/cdrom` by issuing the command:

```
mount -t iso9660 /dev/cdrom /cdrom
```

might add the following to their `.profile` script:

```
PATH=/cdrom/bin/i386-linux:$PATH
export PATH
```

If in doubt, ask your local system support guru to help you work out how to mount your CD-ROM or which directory to use for your system.

Appropriate support files will be installed on your hard disk the first time you need them. It is a good idea to immediately run the `texconfig` script to initialize things, and check it all works.

3.2 Installing \TeX Live to a hard disk

All of the necessary steps to install all or part of the distribution on your hard disk are achieved by mounting the CD-ROM, changing to the top-level directory, and typing:

```
sh install-cd.sh
```

(On some Unix systems, you may need to use *sh5* or *bsh*). This works by accessing lists of collections and packages from the CD-ROM, and trying to guess what sort of computer system you are on; it should start by displaying the following:

```
Initializing collections... Done.
Counting selected collections... Done.
Calculating disk space requirements for
collections...Done.
Initializing system packages... Done.
```

It will then show the main control screen (Figure 1), which lets you change four things:

1. the type of system you are on, or want to install for;
2. the collections you want to install, at *basic*, *recommended* or *other* level;
3. the location on your hard disk to put the files;
4. some runtime behaviour features.

You choose options by typing a letter or number and pressing return. In the example, a Linux ELF system has been detected, the default of all collections to recommended level has been chosen, and the

default installation directory is `/usr/local`; note that the disk space required for the current installation configuration is also displayed. If you make a suggested setup, you need about 172 megabytes of disk free; however, the basic setup will only take about 10 megabytes, and you can enhance it with selected packages as you need them.

Under the directory you choose for installation, the installation script will put the binaries in a subdirectory of `bin`, and the support tree in `share/texmf`.

The `options` item lets you decide whether to make new fonts be created in another location (if you want the main package mounted read-only for most users), and whether to make symbolic links for the *man* and GNU *info* pages in the ‘standard’ locations.

When you choose `<C>` for collections, you will see the display of available collections, the level of installation selected, and the disk space required (Figure 2). You can set alternative levels of installation for each collection, ranging from *none* to *all*. You can either set this for all collections at once, or choose a particular collection and set its level (Figure 3).

When you are finished, return to the main screen, and ask the installation to start. It will take each of the collections and systems that you requested, consult the list of files on the CD-ROM, and build a master list of files to transfer. These will then be copied to your hard disk, and the initialization sequence run (creating format files etc.). When this has finished, all you need do is add the correct subdirectory of `bin` in the \TeX installation to your path, and start using \TeX . If you want to move the binaries up one level, e.g. from `/usr/local/bin/alpha-osf3.2` to `/usr/local/bin`, you need to edit `share/texmf/web2c/texmf.cnf` and change the line

```
prefix = $SELFAUTOPARENT
```

to

```
prefix = $SELFAUTODIR
```

You can of course change the value of `prefix` to any directory you like, and move the support directory there.

3.3 Installing individual packages from \TeX Live to a hard disk

You may want to use the \TeX Live CD-ROM to either update an existing setup, or add features to an earlier installation from the CD-ROM. The main installation program is intended for the first time only, and subsequently you should use the

```

=====> TeX Live installation procedure <=====
===> Note: Letters/digits in brackets indicate menu items <===
===>     for commands or configurable options           <===
  Detected system: Intel PC with Linux (ELF)
  <C> collections:   21 out of 30, disk space required: 163955 kB
  <S> systems:       1 out of 20, disk space required:   7946 kB
                        total disk space required: 171901 kB

  <D> directories:
        TEXDIR = /usr/local
  <O> options:
        [ ] alternate directory for automatically generated fonts
        [ ] create symlinks in standard directories
  Other commands:
        <I> start installation, <H> help, <Q> quit
Enter command:

```

Figure 1: Installation screen, example 1

```

Current collections setup:           total size : 171901 kB
=====
      name      selection      size
<1>  ams        [recommended]   6359 kB
<2>  bibtex     [recommended]   6584 kB
<3>  doc        [recommended]  26531 kB
<4>  dvips      [recommended]    563 kB
<5>  fonts      [recommended]  21862 kB
<6>  formats    [recommended]   1003 kB
<7>  generic    [recommended]    501 kB
<8>  graphics   [recommended]  10373 kB
<9>  lang        [recommended]   3287 kB
<W>  metapost   [recommended]   1280 kB
<X>  latex      [recommended]  28333 kB
<Y>  plain      [recommended]    756 kB
<Z>  texlive    [recommended]  56523 kB
                        SUM:   163955 kB
=====
global commands: select <n>one / <b>asic / r<e>commended / <a>ll
                  for all collections
<R>  return to platform menu
<Q>  quit
Enter command to modify current selection:

```

Figure 2: Installation screen, example 2

```

Collection: Fonts
=====
Fonts, including metrics, virtual fonts and sources
=====
<N>  no packages
<B>  basic packages           [ 2007 kB]
<E>  basic + recommended packages [ 21862 kB]
<A>  all packages            [ 34303 kB]
=====
<R>  return to collection menu
<Q>  quit
Enter command:

```

Figure 3: Installation screen, example 3

`install-pkg.sh` script on the CD-ROM. Run this by mounting the CD-ROM, changing to the mounted directory, and typing

```
sh install-pkg.sh options
```

The script supports nine options; the first four let you set the individual package you want to install, the whole collection (i.e., `ams2`), the name of the mounted CD-ROM directory, and the name of the directory containing the list files (normally these latter two will be set automatically):

```
--package=name
--collection=name
--cddir=name
--listdir=name
```

What actually happens is controlled by four more switches; the first two allow you to exclude documentation or source files from the installation; the third stops the default action of running `MakeTeXls-R` on completion to rebuild the file database, and the last does nothing but list the files that would be installed:

```
--nodoc
--nosrc
--nohash
--listonly
```

Finally, you can specify that instead of installing the files, the script should make a `tar` archive in a specified location:

```
--archive=name
```

Thus, if we simply wanted to see the files that make up the package `fancyhdr` before we installed, our command and output would be as follows:

```
sh install-pkg.sh --package=fancyhdr --listonly
texmf/doc/latex/fancyhdr/fancyhdr.dvi
texmf/doc/latex/fancyhdr/fancyhdr.tex
texmf/lists/latex3/fancyhdr
texmf/source/latex/fancyhdr/README
texmf/source/latex/fancyhdr/fancyheadings.new
texmf/tex/latex/fancyhdr/extramarks.sty
texmf/tex/latex/fancyhdr/fancyhdr.sty
texmf/tex/latex/fancyhdr/fixmarks.sty
```

Other examples of usage are:

- Install the L^AT_EX package `arseneau`:

```
install-pkg.sh --package=arseneau
```
- Install the L^AT_EX package `alg` with no source files and no documentation:

```
install-pkg.sh \
  --package=alg --nosrc --nodoc
```
- Install all the packages available in the ‘extra’ Plain T_EX collection:

```
install-pkg.sh --collection=plain3
```
- Place all files which are need for PStricks in a tar file in `/tmp`:

```
install-pkg.sh --package=pstricks \
  --archive=/tmp/pstricks.tar
```

3.4 texconfig

After the installation program has copied all files to their final locations, you can call a program called `texconfig` that allows you to configure the system to fit your local needs. This can be called at any other time to change your setup, with a full-screen (which requires the `dialog` program) or command-line interface. It should be used for all maintenance, like changes of installed printers, or rebuilding of the file database. Both modes have help text to guide you through the facilities.

3.5 Building on a new platform

If you have a platform for which we have not provided binary sources, you will need to compile T_EX and friends from scratch. This is not as hard as it sounds. What you need is all in the directory `support/texk-7.0` on the CD-ROM.

To compile T_EX, you should get `gcc`, `flex` and a recent version of GNU `make`. `gcc-2.5.8`, `flex-2.4.7` and GNU `make-3.72.1` or newer should be fine. You may be able to work with other C compilers and Make programs, but you will need a good understanding of building Unix programs to sort out problems.

You should first install the support tree from the T_EX Live CD-ROM (do a basic install, with no system binaries chosen). Then copy the `texk-7.0` directory to your disk, and run

```
configure -prefix=$TEXMF
```

where `$TEXMF` is the place where you installed T_EX Live.

Now type `make install-exec` and relax...

4 A user's guide to the Web2c system

Web2c contains a set of T_EX-related programs, i.e., T_EX itself, METAFONT, MetaPost, BIBT_EX, etc. The original implementation was by Tomas Rokicki, who in 1987 developed a first T_EX-to-C system adapting change files under Unix, which were primarily the work of Howard Trickey and Pavel Curtis. Tim Morgan became the maintainer of the system, and during this period the name changed to Web-to-C. In 1990, Karl Berry took over the work, assisted by dozens of additional contributors. The latest result is Web2c Version 7, which was released in February 1997, and forms the basis of the present T_EX Live CD-ROM.

The Web2c 7.0 system runs on Unix, Windows 95/NT, DOS, Amiga, and other operating systems. It uses Knuth's original sources for T_EX and other

basic programs written in `web` and translates them into C source code. Moreover, the system offers a large set of macros and functions developed to augment the original `TEX` software. The most commonly used components are:

`bibtex` Maintaining bibliographies.
`dmp troff` to MPX (MetaPost pictures).
`dvicopy` Virtual font expansion.
`dvitomp` DVI to MPX (MetaPost pictures).
`dvitype` DVI to human-readable text.
`gftodvi` Generic font proofsheets.
`gftopk` Generic to packed fonts.
`gftype` GF to human-readable text.
`makempx` MetaPost label typesetting.
`mf` Creating typeface families.
`mft` Prettyprinting METAFONT source.
`mpost` Creating technical diagrams.
`mpto` MetaPost label extraction.
`newer` Compare modification times.
`patgen` Creating hyphenation patterns.
`pkto gf` Packed to generic fonts.
`pktype` PK to human-readable text.
`pltotf` Property list to TFM.
`pooltype` Display WEB pool files.
`tangle` WEB to Pascal.
`tex` Typesetting.
`tftopl` TFM to property list.
`vftovp` Virtual font to virtual property list
`vptovf` Virtual property list to virtual font.
`weave` WEB to `TEX`.

The precise functions and syntax of these programs are described in the documentation of the individual packages or of `Web2c` itself. However, knowing a few principles governing the whole family of programs will help you to benefit optimally from your `Web2c` installation.

All programs honor the standard GNU options:

`-help` print basic usage summary.
`-verbose` print detailed progress report.
`-version` print version information, then exit.

For locating files the `Web2c` programs use the path searching library `Kpathsea`. This library uses a combination of environment variables and a few configuration files to optimize searching the `TEX` directory tree. `Web2c` 7.0 can handle more than one directory tree simultaneously, which is useful if one wants to maintain `TEX`'s standard distribution and local extensions in two distinct trees. To speed up file searches the root of each tree has a file `ls-R`, containing an entry showing the name and relative pathname for all files “hanging” under that root.

4.1 `Kpathsea` path searching

Let us first describe the generic path searching mechanism of the `Kpathsea` library.

We call a *search path* a colon- or semicolon-separated list of *path elements*, which are basically directory names. A search path can come from (a combination of) many sources. To look up a file “`my_file`” along a path “`./dir`”, `Kpathsea` checks each element of the path in turn: first `./my_file`, then `/dir/my_file`, returning the first match (or possibly all matches).

In order to adapt optimally to all operating systems’ conventions, on non-Unix systems `Kpathsea` can use filename separators different from “colon” (“`:`”) and “slash” (“`/`”).

To check a particular path element p , `Kpathsea` first checks if a prebuilt database (see “Filename database” on p. 89) applies to p , i.e., if the database is in a directory that is a prefix of p . If so, the path specification is matched against the contents of the database.

If the database does not exist, or does not apply to this path element, or contains no matches, the filesystem is searched (if this was not forbidden by a specification starting with “`!!`” and if the file being searched for must exist). `Kpathsea` constructs the list of directories that correspond to this path element, and then checks in each for the file being searched for.

The “file must exist” condition comes into play with VF files and input files read by `TEX`'s `\openin` command. Such files may not exist (e.g., `cmr10.vf`), and so it would be wrong to search the disk for them. Therefore, if you fail to update `ls-R` when you install a new VF file, it will never be found.

Each path element is checked in turn: first the database, then the disk. If a match is found, the search stops and the result is returned.

Although the simplest and most common path element is a directory name, `Kpathsea` supports additional features in search paths: layered default values, environment variable names, config file values, users’ home directories, and recursive subdirectory searching. Thus, we say that `Kpathsea` *expands* a path element, meaning transforming all the specifications into basic directory name or names. This is described in the following sections in the same order as it takes place.

Note that if the filename being searched for is absolute or explicitly relative, i.e., starts with “`/`” or “`./`” or “`././`”, `Kpathsea` simply checks if that file exists.

4.1.1 Path sources

A search path can come from many sources. In the order in which Kpathsea uses them:

1. A user-set environment variable, for instance, `TEXINPUTS`. Environment variables with a period and a program name appended override; e.g., if “`latex`” is the name of the program being run, then `TEXINPUTS.latex` will override `TEXINPUTS`.
2. A program-specific configuration file, for example, a line “`S /a:/b`” in `dvips' config.ps`.
3. A Kpathsea configuration file `texmf.cnf`, containing a line like “`TEXINPUTS=/c:/d`” (see below).
4. The compile-time default.

You can see each of these values for a given search path by using the debugging options (see “Debugging actions” on p. 92).

4.1.2 Config files

Kpathsea reads *runtime configuration files* named `texmf.cnf` for search path and other definitions. The search path used to look for these files is named `TEXMFCNF` (by default such a file lives in the `share/texmf/web2c` subdirectory). All `texmf.cnf` files in the search path will be read and definitions in earlier files override those in later files. Thus, with a search path of “`.$TEXMF`”, values from `./texmf.cnf` override those from `$TEXMF/texmf.cnf`.

While reading the description of the format of the file `texmf.cnf` below, please also refer to p. 95, which lists the `texmf.cnf` file on the CD-ROM.

- Comments start with “`%`” and continue to the end of the line.
- Blank lines are ignored.
- A `\` at the end of a line acts as a continuation character, i.e., the next line is appended. Whitespace at the beginning of continuation lines is not ignored.
- Each remaining line must look like


```
variable[.prognam] [=] value
```

 where the “`=`” and surrounding whitespace is optional.
- The *variable* name may contain any character other than whitespace, “`=`”, or “`.`”, but sticking to “`A-Za-z_`” is safest.
- If “`.prognam`” is present, the definition only applies if the program that is running is named *prognam* or *prognam.exe*. This allows different flavors of \TeX to have different search paths, for example.

- *value* may contain any characters except “`%`” and “`@`”. The “`$var.prog`” feature is not available on the right-hand side; instead, you must use an additional variable (see the definition of the variable `latex2e_inputs` for example). A “`;`” in *value* is translated to “`:`” if running under Unix; this is useful to write a single `texmf.cnf` which can be used under both Unix and NT.
- All definitions are read before anything is expanded, so you can use variables before they are defined.

A configuration file fragment illustrating most of these points is shown below:

```
% TeX input files -- i.e.,
% anything found by \input or \openin ...
latex209_inputs = \
  :.$TEXMF/tex/latex209//:$TEXMF/tex//
latex2e_inputs = \
  :.$TEXMF/tex/latex//:$TEXMF/tex//
TEXINPUTS = :.$TEXMF/tex//
TEXINPUTS.latex209 = $latex209_inputs
TEXINPUTS.latex2e = $latex2e_inputs
TEXINPUTS.latex = $latex2e_inputs
```

4.1.3 Path expansion

Kpathsea recognizes certain special characters and constructions in search paths, similar to that in Unix shells. As an general example, the following complex path: `~$USER/{foo,bar}//baz` expands to all subdirectories under directories `foo` and `bar` in `$USER`'s home directory that contain a directory or file `baz`. These expansions are explained in the sections below.

4.1.4 Default expansion

If the highest-priority search path (see “Path sources” on p. 88) contains an *extra colon* (i.e., leading, trailing, or doubled), Kpathsea inserts at that point the next-highest-priority search path that is defined. If that inserted path has an extra colon, the same happens with the next-highest. For example, given an environment variable setting

```
setenv TEXINPUTS /home/karl:
```

and a `TEXINPUTS` value from `texmf.cnf` of

```
 :.$TEXMF//tex
```

then the final value used for searching will be:

```
/home/karl: :.$TEXMF//tex
```

Since it would be useless to insert the default value in more than one place, Kpathsea changes only one extra “`:`” and leaves any others in place: it checks first for a leading “`:`”, then a trailing “`:`”, then a doubled “`:`”.

4.1.5 Brace expansion

A useful feature is brace expansion, which means that, for instance, `v{a,b}w` expands to `vaw:vbw`. Nesting is allowed. This can be used to implement multiple \TeX hierarchies, by assigning a brace list to `$TEXMF`.

For example, in `texmf.cnf`, you find the following definition:

```
texdir = $TEXMFLOCAL/tex,!!$TEXMFMAIN/tex
```

Then you can write something like:

```
TEXINPUTS = .;$texdir//
```

which means that after looking in the current directory, first the full `$TEXMFLOCAL/tex` directory tree (on disk) and then the `!!$TEXMFMAIN/tex` tree (using the data base file `ls-R` *only*) will be searched. It is a convenient way for running two parallel \TeX structures, one “frozen” (like on a CD-ROM) and the other being continuously updated with new versions as they become available. By using the `$texdir` variable in all definitions, one is sure to always search the up-to-date tree first.

4.1.6 Subdirectory expansion

Two or more consecutive slashes in a path element following a directory *d* is replaced by all subdirectories of *d*: first those subdirectories directly under *d*, then the subsubdirectories under those, and so on. At each level, the order in which the directories are searched is *unspecified*.

If you specify any filename components after the `“//”`, only subdirectories with matching components are included. For example, `“/a//b”` expands into directories `/a/1/b`, `/a/2/b`, `/a/1/1/b`, and so on, but not `/a/b/c` or `/a/1`.

Multiple `“//”` constructs in a path are possible, but `“//”` at the beginning of a path is ignored.

4.1.7 List of special characters and their meaning: a summary

The following list summarises the meaning of special characters in Kpathsea configuration files.

- : Separator in path specification; at the beginning or the end of a path it substitutes the “default” path expansion.
- ; Separator on non-Unix systems (acts like :).
- \$ Variable expansion.
- ~ Represents the user’s home directory.
- {...} Brace expansion, e.g., `a{1,2}b` will become `a1b:a2b`.
- // Subdirectory expansion. It can occur in the middle or at the end of a path (not at the beginning).

% Start of comment.

\ Continuation character (allows multi-line entries).

!! Search *only* database to locate file, *do not* search the disk.

4.2 Filename databases

Kpathsea goes to some lengths to minimize disk accesses for searches. Nevertheless, at installations with enough directories, searching each possible directory for a given file can take an excessively long time (this is especially true if many hundreds of font directories have to be traversed.) Therefore, Kpathsea can use an externally-built “database” file named `ls-R` that maps files to directories, thus avoiding the need to exhaustively search the disk.

A second database file `aliases` allows you to give additional names to the files listed in `ls-R`. This can be helpful to adapt to “8.3” filename conventions in source files.

4.2.1 `ls-R` filename database

As explained above, the name of the main filename database must be `ls-R`. You can put one at the root of each \TeX installation hierarchy you wish to search (`$TEXMF` by default); most sites have only one hierarchy. Kpathsea looks for `ls-R` files along the `TEXMFDBS` path.

The recommended way to create and maintain “`ls-R`” is to run the `MakeTeXls-R` script coming with the distribution. It is invoked by the various “`MakeTeX...`” scripts. In principle, this script just runs the command

```
cd /your/texmf/root && ls -LAR ./ >ls-R
```

presuming your system’s `ls` produces the right output format (GNU’s `ls` is all right). To ensure that the database is always up to date, it is easiest to rebuild it regularly via `cron`, so that for changes in the installed files—perhaps after installing or updating a \LaTeX package—the file `ls-R` is automatically updated.

If a file is not found in the database, by default Kpathsea goes ahead and searches the disk. If a particular path element begins with `“!!”`, however, *only* the database will be searched for that element, never the disk.

4.2.2 `kpsewhich`: Standalone path searching

The `kpsewhich` program exercises path searching independent of any particular application. This can be useful as a sort of `find` program to locate files in \TeX hierarchies (this is used heavily in the distributed “`MakeTeX...`” scripts).

```
kpsewhich option... filename...
```

Options can start with either “-” or “--”, and any unambiguous abbreviation is accepted.

Kpathsea looks up each non-option argument on the command line as a filename, and returns the first file found. There is no option to return all the files with a particular name (you can run the Unix “find” utility for that).

The more important options are described next.

-dpi=*num* Set the resolution to *num*; this only affects “gf” and “pk” lookups. “-D” is a synonym, for compatibility with dvips. Default is 600.

-format=*name*

Set the format for lookup to *name*. By default, the format is guessed from the filename. In fact, the recognized filename extensions and the allowable *names* (including any leading “.”) are the same.

You can also specify an integer for *name*; this is the only way to specify formats that don’t have an associated suffix, such as MetaPost support files and dvips configuration files. It’s also somewhat faster, since no unused formats need to be initialized. The integers appear in the output of “-help”. Currently recognized file type numbers, with their description, possible file extensions, and the corresponding environment variables (between parentheses¹) as follows:

- 0 Generic font files
 - .gf (GFFONTS, GLYPHFONTS, TEXFONTS)
- 1 packed font files
 - .pk (PKFONTS, TEXPKS, GLYPHFONTS, TEXFONTS)
- 2 T_EX bitmap font
 - (GLYPHFONTS)
- 3 Adobe PostScript font metrics
 - .afm (AFMFONTS)
- 4 METAFONT memory dump
 - .base (MFBASES, TEXMFINI)
- 5 BibT_EX bibliography database
 - .bib (BIBINPUTS, TEXBIB)
- 6 BibT_EX styles
 - .bst (BSTINPUTS)
- 7 Runtime configuration files
 - .cnf (TEXMFCNF)
- 8 Web2c filename database
 - ls-R (TEXMFDBS)
- 9 T_EX memory dump
 - .fmt (TEXFORMATS, TEXMFINI)
- 10 T_EX generic font maps
 - .map (TEXFONTMAPS)
- 11 MetaPost memory dump
 - .mem (MPMEMS, TEXMFINI)
- 12 METAFONT source files

- .mf (MFINPUTS)
- 13 METAFONT program strings
 - .pool (MFPPOOL, TEXMFINI)
- 14 METAFONT prettyprinter style files
 - .mft (MFTINPUTS)
- 15 MetaPost sources
 - .mp (MPINPUTS)
- 16 MetaPost program strings
 - .pool (MPPPOOL, TEXMFINI)
- 17 MetaPost support files
 - (MPSUPPORT)
- 18 Ω compiled process
 - .ocp (OCPINPUTS)
- 19 Ω font metrics
 - .ofm (OFMFONTS, TEXFONTS)
- 20 Ω property list
 - .opl (OPLFONTS, TEXFONTS)
- 21 Ω translation process files
 - .otp (OTPINPUTS)
- 22 Ω virtual fonts
 - .ovf (OVFFONTS, TEXFONTS)
- 23 Ω virtual property lists
 - .ovp (OVPFONTS, TEXFONTS)
- 24 graphics/figure
 - .eps .epsi (TEXPICTS, TEXINPUTS)
- 25 Source input files read by T_EX
 - .tex .ltx .dtx .texi .texinfo
 - .txi .cls .sty .eps .epsi
 - (TEXINPUTS)
- 26 T_EX documentation
 - .ps .pdf .doc .txt (TEXDOCS)
- 27 T_EX program strings
 - .pool (TEXPOOL, TEXMFINI)
- 28 T_EX system package sources
 - .dtx .ins (TEXSOURCES)
- 29 PostScript header/font
 - .pro (TEXPSHEADERS, PSHEADERS)
- 30 Troff fonts
 - (TRFONTS)
- 31 T_EX font metric files
 - .tfm (TFMFONTS, TEXFONTS)
- 32 PostScript type1 fonts
 - .pfa .pfb (T1FONTS, T1INPUTS, TEXPSHEADERS, PSHEADERS)
- 33 virtual fonts
 - .vf (VFFONTS, TEXFONTS)
- 34 dvips configuration files
 - config.###, ###.map (TEXCONFIG)
- 35 MakeIndex style files
 - .ist (TEXIDXSTYLE, INDEXSTYLE)

These environment variables are set by default in the configuration file `texmf.cnf`. It is only when you want to override one or more of the values specified in that file that you might want to set them explicitly in your execution environment.

Note that the “-format” and “-path” options are mutually exclusive.

¹ You can find definitions for these environment variables in the file `texmf.cnf` (p. 95)

- `-mode=string`
Set the mode name to *string*; this also only affects “gf” and “pk” lookups. No default: any mode will be found.
- `-must-exist`
Do everything possible to find the files, notably including searching the disk. By default, only the `ls-R` database is checked, in the interest of efficiency.
- `-path=string`
Search along the path *string* (colon-separated as usual), instead of guessing the search path from the filename. “//” and all the usual expansions are supported. The options “-path” and “-format” are mutually exclusive.
- `-progrname=name`
Set the program name to *name*. This can affect the search paths via the “.progrnam” feature in configuration files. The default is “kpsewhich”.
- `-show-path=name`
shows the path used for file lookups of file type *name*. Either a filename extension (“.pk”, “.vf”, etc.) or an integer can be used, just as with “-format” option.
- `-debug=num`
sets the debugging options to *num*.

4.2.3 Examples of use

Let us now have a look at Kpathsea in action.

```
>> kpsewhich -format=.tex article.cls
/usr/local/share/texmf/tex/latex/base/article.cls
```

We are looking for the file `article.cls` in the T_EX source file directories (type `.tex`, format type 25). We find it in the subdirectory `tex/latex/base` below the “TEXMF” root directory. To save space, in the following examples we will denote with `...` the repetitive part `/usr/local/share/texmf` preceding each file path.

```
>> kpsewhich tugboat.bib
.../bibtex/bib/beebe/tugboat.bib
```

BIB_TE_X bibliography databases correspond to format type `.bib`. Here we located file `tugboat.bib`.

```
>> kpsewhich cmr10.pk
.../fonts/pk/ljfour/public/cm/cmr10.600pk
```

```
>> kpsewhich -dpi=300 cmr10.pk
```

```
>> kpsewhich ptmb8r.pk
.../fonts/pk/modelless/dpi597/ptmb8r.pk
```

```
>> kpsewhich -dpi=300 ptmb8r.pk
.../fonts/pk/modelless/dpi300/ptmb8r.pk
```

Font bitmap glyph files of type `.pk` correspond to format type 2. They are used by visualization programs like `dvips` and `xdvi`. On our system we found the Computer Modern file `cmr10` for the mode `ljfour`, at a base resolution of 600 dpi (dots per inch). However, when specifying that we are only interested in a resolution of 300dpi (`-dpi=300`) we are told there is no such font available on the system. In fact, a program like `dvips` or `xdvi` would go off and actually build the `.pk` files at the required resolution using the script `MakeTeXPK`. The last two commands look for a file `ptmb8r.pk`. When specifying no explicit resolution the system returns one (at 597 dpi) which is closest to the “default” set in the `MakeTeXPK` script (600 dpi). However, when specifying the desired resolution (300 dpi) the full path name of the relevant target file is shown.

Next we turn our attention to `dvips`’s header (format type 29) and configuration files (format type 34).

```
>> kpsewhich tex.pro
.../dvips/base/tex.pro

>> kpsewhich -format=34 psfonts.map
.../dvips/base/psfonts.map

>> kpsewhich -format=.map config.ps
.../dvips/config/config.ps
```

We first look at a few of the commonly used files, namely the general prolog `tex.pro` for T_EX support, before turning our attention to the generic configuration file (`config.ps`) and the PostScript font map `psfonts.map`. Note how we fool the system by asking for `config.ps` as if it had a suffix of `.map`.

We now look a little closer at the URW Times PostScript support files. The name for these in Berry’s font naming scheme is “utm”. The first file we look at is the configuration file, which contains the name of the map file.

```
>> kpsewhich -format=34 config.utm
.../dvips/config/config.utm
```

The contents of that file is

```
p +utm.map
```

which points to the file `utm.map`, which we want to locate next.

```
>> kpsewhich utm.map
.../dvips/urw/utm.map
```

In this map file, which resides in `dvips`’s `urw` subdirectory, the file names of the Type1 PostScript

fonts referenced are defined. The contents looks like (we only show part of the lines):

```
utmb8r NimbusRomNo9L-Medi ... <utmb8a.pfb
utmbi8r NimbusRomNo9L-MediItal... <utmbi8a.pfb
utmr8r NimbusRomNo9L-Regu ... <utmr8a.pfb
utmri8r NimbusRomNo9L-ReguItal... <utmri8a.pfb
utmbo8r NimbusRomNo9L-Medi " ... <utmb8a.pfb
utmro8r NimbusRomNo9L-Regu " ... <utmr8a.pfb
```

Let's, for instance take the Times Regular instance `utmr8a.pfb`, and find its position in the `texmf` directory tree by using a search with format type 32.

```
>> kpsewhich utmr8a.pfb
.../fonts/type1/urw/utm/utmr8a.pfb
```

It should be evident from these few examples how one can easily locate the whereabouts of a given file. This is especially important if you suspect that the wrong version of a file is picked up somehow, since `kpsewhich` will show you the first file encountered.

4.2.4 Debugging actions

Sometimes it is necessary to really investigate how a program resolves file references. To make this feasible in a convenient way Kpathsea offers various debug levels:

- 1 `stat` calls (file tests). When running with an up-to-date `ls-R` database this should almost give no output.
- 2 References to hash tables (like `ls-R` database, map files, configuration files).
- 4 File open and close operations.
- 8 General path information for file types searched by Kpathsea. This is useful to find out where a particular path for the file was defined.
- 16 Directory list for each path element (only relevant for searches on disk).
- 32 File searches.

A value of `-1` will set all the above options; in practice you will probably always use these levels if you need any debugging.

Similarly, with the `dvips` program one can, by setting some debug switches, follow in detail where files are picked up from. Alternatively, when a file is not found, the debug trace shows in which directories the program looks for the given file, so that one can get an indication what the problem is.

Generally speaking, as most programs call the Kpathsea library internally, you can select a debug option by using the `KPATHSEA_DEBUG` environment variable, and setting it to (a combination of) values as described in the above list.

Let us consider, as an example, a small \LaTeX source file, `hello_world.tex`, which contains the following input.

```
\documentclass{article}
\begin{document}
Hello World!
\end{document}
```

This little file only used the font `cmr10`, so let us look how `dvips` prepares the PostScript file.

```
>> dvips -d4100 hello_world -o
```

In this case we have combined `dvips`'s debug class 4 (font paths) with Kpathsea's path element expansion (see `dvips` Reference Manual). We get something like shown below (we have rearranged the output for easier display).

```
debug:start search(file=texmf.cnf, must_exist=1,
                  find_all=1,
                  path=./usr/local/bin/texlive:/usr/local/bin:
                    /usr/local/bin/share/texmf/web2c:/usr/local:
                    /usr/local/share/texmf/web2c:
                    /././teTeX/TeX/share/texmf/web2c:).
kdebug:start search(file=ls-R, must_exist=1,
                   find_all=1,
                   path=/usr/local/texmf:/usr/local/share/texmf).
kdebug:search(ls-R) =>/usr/local/share/texmf/ls-R
kdebug:start search(file=aliases, must_exist=1,
                   find_all=1,
                   path=/usr/local/texmf:/usr/local/share/texmf).
kdebug:search(aliases) =>
kdebug:start search(file=config.ps, must_exist=0,
                   find_all=0,
                   path=./usr/local/texmf/dvips//:
                     !!/usr/local/share/texmf/dvips//).
kdebug:search(config.ps) =>
  /usr/local/share/texmf/dvips/config/config.ps
kdebug:start search(file=/root/.dvipsrc,
                   must_exist=0, find_all=0,
                   path=./usr/local/texmf/dvips//:
                     !!/usr/local/share/texmf/dvips//).
kdebug:search($HOME/.dvipsrc) =>
  ...
kdebug:start search(file=psfonts.map, must_exist=0,
                   find_all=0,
                   path=./usr/local/texmf/dvips//:
                     !!/usr/local/share/texmf/dvips//).
kdebug:search(psfonts.map) =>
  /usr/local/share/texmf/dvips/base/psfonts.map
```

First `dvips` locates its working files. It first found `texmf.cnf` (with the definitions of the paths of the other files), then the file data base `ls-R` (to optimize file searching). It goes on to find the generic configuration file `config.ps`, and then looks for the customization file `.dvipsrc` (which, in this case is *not found*). Finally `dvips` locates the generic map file for PostScript fonts `psfonts.map` (defining the relation between the internal and external names for the PostScript fonts).

At this point `dvips` identifies itself to the user: `dvipsk 5.66a Copyright 1986-97 Radical Eye Software (www.radicleye.com)`

then goes on to look for the prolog file `texc.pro`,

```
kdebug:start search(file=texc.pro, must_exist=0,
                    find_all=0,
                    path=./usr/local/texmf/dvips//:
                    !!/usr/local/share/texmf/dvips//:
                    /usr/local/texmf/fonts//type1//:
                    !!/usr/local/share/texmf/fonts//type1//).
kdebug:search(texc.pro) =>
  /usr/local/share/texmf/dvips/base/texc.pro
```

After having found the file, `dvips` outputs date and time, and informs us that it will generate the file `hello_world.ps`, then that it needs the font file `cmr10`, and that the latter is declared as “resident”

```
' TeX output 1997.05.01:1316' -> hello_world.ps
Defining font () cmr10 at 10.0pt
Font cmr10 <CMR10> is resident.
```

Now the search is on for the file `cmr10.tfm`, which is found, then a few more prolog files (not shown), and finally for the `Type1` instance `cmr10.pfb` of the font (which is found) and included in the output file (see last line).

```
kdebug:start search(file=cmr10.tfm, must_exist=1,
                    find_all=0,
                    path=./usr/local/texmf/fonts/tfm//:
                    !!/usr/local/share/texmf/fonts/tfm//:
                    /var/tex/fonts/tfm//).
kdebug:search(cm10.tfm) =>
  /usr/local/share/texmf/fonts/tfm/public/cm/cmr10.tfm
kdebug:start search(file=texps.pro, must_exist=0,
                    find_all=0,
                    ...
  <texps.pro>.

kdebug:start search(file=cmr10.pfb, must_exist=0,
                    find_all=0,
                    path=./usr/local/texmf/dvips//:
                    !!/usr/local/share/texmf/dvips//:
                    /usr/local/texmf/fonts//type1//:
                    !!/usr/local/share/texmf/fonts//type1//).
kdebug:search(cm10.pfb) =>
  /usr/local/share/texmf/fonts/type1/public/cm/cmr10.pfb
<cmr10.pfb>[1]
```

4.3 Runtime options

Another of the nice features of `Web2c 7.0` is its possibility to control a number of memory parameters (in particular, array sizes) via the runtime file `texmf.cnf` read by `Kpathsea`. A detailed list of all set-table parameters can be found in that file (see p. 95, Part 3 starting at line 261). The most interesting values are:

main_memory Total words of memory available, for `TeX`, `METAFONT`, and `MetaPost`. You must make a new format file for each different setting. For instance, you could generate a “huge” version of `TeX`, and call the format file `hugetex.fmt`. Using the standard way of specifying the program name used by `Kpathsea` the particular value of the `main_memory` variable

will then be read from `texmf.cnf` (See p. 95, line 280 for the generic value and line 281 for the “huge” one instantiated by `hugetex`).

extra_mem_bot Extra space for “large” `TeX` data structures: boxes, glue, breakpoints, etc. Especially useful if you use `PiCTEX`.

font_mem_size Number of words for font information available for `TeX`. This is more or less the total size of all TFM files read.

hash_extra Additional space for the hash table of control sequence names. Approximately 10,000 control sequences can be stored in the main hash table; if you have a large book with numerous cross-references, this might not be enough. On line 297 and 298 of file `texmf.cnf` as shown in p. 95 you see that both the `hugetex` and `pdftex` program invocations ask for an extra 10,000 control sequences (the default value of `hash_extra` is zero, as seen on line 296).

Of course, this facility is no substitute for truly dynamic arrays and memory allocation, but since this is extremely difficult to implement in present `TeX`, these runtime parameters provide a practical compromise allowing some flexibility.

5 Other packages on the CD-ROM

While the main portion of `TeX Live` (the fonts, macros and documentation) can be used on any `TeX` system, the set of runnable binaries is not suitable for everyone. To make the disk as widely useful as possible, we have included the original distributions of four complete `TeX` systems, two for Macintosh, one for Windows 95, and one for DOS and OS/2. Windows 3.1 users should look at the `GUTenberg` distribution on the CD-ROM.

5.1 OzTeX²

`OzTeX` is a Macintosh `TeX` system created by Andrew Trevorrow. The `OzTeX` application includes `TeX`, `INITEX`, a DVI previewer, a DVI-to-PostScript translator (Tom Rokicki’s `dvips`) and a driver for QuickDraw printers. `OzTeX` also includes `dvidvi`, `dvicopy`, and Angus Duggan’s PostScript utilities: `psbook`, `psnup`, `psselect` and `pstops`.

The version of `dvips` included in `OzTeX` supports `HyperTeX` and the partial downloading of PostScript fonts. It has also been enhanced for Mac users in a number of ways: Standard Mac PostScript fonts (LWFN files) can be downloaded, fully or partially. All `OzTeX`-specific `\special` commands are supported, such as the inclusion of

² This section was written by Andrew Trevorrow.

PICT/PNTG/EPST files. The `dvips` output can be sent directly to the current printer.

OzTeX's previewer has lots of features to make it easy to proofread DVI files. It can handle PK and PostScript fonts. Anti-aliasing is supported. Virtual fonts are processed on the fly. The previewer supports most of the `\special` commands generated by L^AT_EX's `color`, `graphics/x` and `hyperref` packages. It recognizes all `dvips`-specific `\specials` and those it cannot handle (like rotation) are silently ignored.

OzTeX includes all the most popular formats and macro packages. Plain T_EX, L^AT_EX, AMS-T_EX, AMS-L^AT_EX and REV_TE_X are all installed and ready to run.

OzTeX is easy to extend and customize. A default configuration file is read when OzTeX starts up; it contains a host of parameters for setting up search paths, telling T_EX how much memory to allocate for various arrays, specifying which T_FM's are for PostScript fonts, etc. A Config menu makes it easy to load other config files at any time. And for even more flexibility, OzTeX can automatically load a specified config file just before typesetting, previewing or printing.

5.1.1 Additional programs

The usual assortment of T_EX-related programs are provided with OzTeX, including OzMF, a Mac implementation of METAFONT, and OzMP, a Mac port of John Hobby's MetaPost program for producing PostScript pictures using a METAFONT-like language.

The following programs are also distributed with OzTeX, courtesy of their authors; BibT_EX by Vince Darley; MakeIndex by Rick Zaccane; Excalibur, a T_EX/L^AT_EX spelling checker, by Rick Zaccane and Robert Gottshall; and AlphaLite, a T_EX/L^AT_EX-savvy text editor, by Pete Keleher.

For the latest information about OzTeX, keep an eye on the Web page at the URL <http://www.kagi.com/authors/akt/oztex.html>.

An even better way to keep up-to-date is to join the `oztex-info` mailing list. To subscribe, send some e-mail to

`majordomo@maths.adelaide.edu.au`

with the following line in the *body* of the message:

`subscribe oztex-info`

OzTeX is distributed as shareware, so you are welcome to try it out before paying the registration fee. The individual fee is US\$30 and the site fee is US\$300. See the "Shareware Fee" item in OzTeX's Help menu for details on how to pay. E-mail support

is provided to registered users. Send all queries and comments to Andrew Trevorrow (akt@kagi.com).

5.2 CMacTeX³

CMacTeX is an implementation of T_EX for the Macintosh by Thomas Kiffe (<mailto:tkiffe@math.tamu.edu>). It includes the three main parts of any T_EX installation — T_EX, METAFONT and `dvips`. It also includes two dvi previewers, a utility for printing dvi files on a non PostScript printer, a PostScript previewer and numerous utilities for manipulating T_EX fonts. Full support for the automatic generation of pk font files is an integral part of the distribution. CMacTeX can be configured to work in an integrated fashion with BBedit, Alpha, and MPW. It will run on any Macintosh with 8 MB of RAM and System 7.

CMacTeX is shareware. The registration fee is US\$35 for a single-user license and US\$150 for a site license.

Installation instructions can be found in the file `/macintosh/cmactex/ReadMeFirst`

5.3 MiKTeX⁴

MiKTeX 1.07 is an implementation by Christian Schenk (<mailto:cschenk@berlin.snafu.de>) of T_EX and METAFONT related utilities for Windows NT and Windows 95. The MiKTeX distribution includes T_EX; L^AT_EX 2_ε Dec'96 including standard packages; METAFONT; MetaPost; `dvips` MakeIndex; BIBT_EX; YAP (Yet Another Previewer); TeXware (`dvitype` etc.); METAFONTware (`gftopk` etc.); `psutils` (`psselect`, `pstops` etc.); and DVICopy.

Installation instructions can be found in the file `/win32/miktex/README.TXT`

5.4 emTeX

The emTeX distribution for DOS and OS/2 is written by Eberhard Mattes (<mailto:mattes@azu.informatik.uni-stuttgart.de>). It includes the T_EX typesetter, the METAFONT font generation program, printer drivers, screen previewers, and tools like BIBT_EX and MakeIndex. It also includes the macro packages L^AT_EX 2.09 and L^AT_EX 2_ε. Fonts are included as pixel files and METAFONT source files.

Installation instructions can be found in the file `/msdos/emtex/README.ENG`

³ This section is taken from the CMacTeX documentation.

⁴ This section is drawn from the documentation.

A The texmf.cnf file

```

1  % original texmf.cnf -- runtime path configuration file for kpathsea.
2  % (If you change or delete 'original' on the previous line, the
3  % distribution won't install its version over yours.)
4  % Public domain.
5  %
6  % What follows is a super-summary of what this .cnf file can
7  % contain. Please read the Kpathsea manual for more information.
8  %
9  % texmf.cnf is generated from texmf.cnf.in, by replacing @var@ with the
10 % value of the Make variable 'var', via a sed file texmf.sed, generated
11 % (once) by kpathsea/Makefile (itself generated from kpathsea/Makefile.in
12 % by configure).
13 %
14 % Any identifier (sticking to A-Za-z_ for names is safest) can be assigned.
15 % The '=' (and surrounding spaces) is optional.
16 % No % or @ in texmf.cnf.in, for the sake of autogeneration.
17 % (However, %'s and @'s can be edited into texmf.cnf or put in envvar values.)
18 % $foo (or ${foo}) in a value expands to the envvar or cnf value of foo.
19 %
20 % Earlier entries (in the same or another file) override later ones, and
21 % an environment variable foo overrides any texmf.cnf definition of foo.
22 %
23 % All definitions are read before anything is expanded, so you can use
24 % variables before they are defined.
25 %
26 % If a variable assignment is qualified with '.PROGRAM', it is ignored
27 % unless the current executable (last filename component of argv[0]) is
28 % named PROGRAM. This foo.PROGRAM construct is not recognized on the
29 % right-hand side. For environment variables, use FOO_PROGRAM.
30 %
31 % Which file formats use which paths for searches is described in the
32 % various programs' and the kpathsea documentation.
33 %
34 % // means to search subdirectories (recursively).
35 % A leading !! means to look only in the ls-R db, never on the disk.
36 % A leading/trailing/doubled : in the paths will be expanded into the
37 % compile-time default. Probably not what you want.
38 %
39 % Part 1: Search paths and directories.
40 %
41 % The root of everything below.
42 prefix = $SELFAUTOPARENT
43 %
44 % You can set an environment variable to override this if you're testing
45 % a new TeX tree, without changing anything else.
46 %
47 % You may wish to use one of the $SELFAUTO... variables here so TeX will
48 % find where to look dynamically. See the manual and the definition
49 % below of TEXMFCNF.
50 %
51 % If you have multiple trees, you can use shell brace notation, for example:
52 % TEXMF = {/usr/local/mytex,/usr/local/othertex}
53 % and also set TEXMFDBS to /usr/local/mytex:/usr/local/othertex.
54 TEXMFLOCAL=/usr/local/texmf
55 TEXMFMAIN = $prefix/share/texmf
56 TEXMFLS_R = $TEXMFLOCAL
57 % Where to look for ls-R files. There need not be an ls-R in the

```

```

58 % directories in this path, but if there is one, Kpathsea will use it.
59 TEXMFDBS = $TEXMFLOCAL;$TEXMFMAIN
60
61 % Where you want generated files to go. Choose one of the texmf trees
62 % listed in $TEXMF. The following is the default:
63 VARTEXMF = $TEXMFLOCAL
64
65 % The TeX inputs and fonts directories.
66 texdir = {$TEXMFLOCAL/tex,!$TEXMFMAIN/tex}
67 omegadir = {$TEXMFLOCAL/omega,!$TEXMFMAIN/omega}
68 fontdir = {$TEXMFLOCAL/fonts,!$TEXMFMAIN/fonts}
69 dbmain=!$TEXMFMAIN
70 %
71 dbtex = $texdir
72 dbomega = $omegadir
73 dbfonts = $fontdir
74
75 % TeX input files -- i.e., anything to be found by \input or \openin,
76 % including .sty, .eps, etc.
77 TEXINPUTS = .;$dbtex//
78
79 % LaTeX 2e specific macros are stored in latex.
80 % latex209 is not supported, at the request of the authors of LaTeX
81 %
82 latex_inputs = .;$dbtex/latex//;$dbtex/generic//
83 TEXINPUTS.latex = $latex_inputs
84 TEXINPUTS.latextex = $latex_inputs
85
86 % Omega
87 TEXINPUTS.lambda2e = .;$dbomega/lambda//;$latex_inputs
88 TEXINPUTS.lambda = .;$dbomega/lambda//;$latex_inputs
89
90 % Fontinst needs to read afm files.
91 TEXINPUTS.fontinst = .;$dbtex//;$dbfonts/afm//
92
93 % Plain TeX. Have the command tex check all directories as a last
94 % resort, we may have plain-compatible stuff anywhere.
95 plain_inputs = $dbtex/plain//;$dbtex/generic//
96 TEXINPUTS.textex = .;$dbtex//;$plain_inputs
97 TEXINPUTS.tex = .;$plain_inputs;$dbtex//
98 TEXINPUTS.omega = .;$dbomega//;$plain_inputs;$dbtex//
99
100 % INITEX. May as well make this separate so it can search on disk;
101 % initex is seldom run, and might be used directly after files have been
102 % added, when ls-R may not up be to date.
103 TEXINPUTS.initex = .;$texdir//
104 TEXINPUTS.iniomega = .;$omegadir//;$texdir//
105
106 % Earlier entries override later ones, so put this last.
107 TEXINPUTS.viomega = .;$dbomega//;$dbtex//
108 TEXINPUTS = .;$dbtex//
109
110 % Metafont, MetaPost inputs.
111 MFINPUTS = .;{$TEXMFLOCAL,$dbmain}/metafont//;{$dbfonts,$VARTEXFONTS}/source//
112 MPINPUTS = .;{$TEXMFLOCAL,$dbmain}/metapost//
113
114 % Dump files (fmt/base/mem) for vir{tex,mf,mp} to read (see
115 % web2c/INSTALL), and string pools (.pool) for ini{tex,mf,mp}. It is
116 % silly that we have six paths and directories here (they all resolve to

```



```

117 % a single place by default), but historically ...
118 TEXFORMATS = .;{$TEXMFLOCAL,$dbmain}/web2c
119 MFBASES = .;{$TEXMFLOCAL,$dbmain}/web2c
120 MPMEMS = .;{$TEXMFLOCAL,$dbmain}/web2c
121 TEXPOOL = .;{$TEXMFLOCAL,$dbmain}/web2c
122 MFPOOL = .;{$TEXMFLOCAL,$dbmain}/web2c
123 MPPPOOL = .;{$TEXMFLOCAL,$dbmain}/web2c
124
125 % If you have a read-only central font directory and therefore need to
126 % cache MakeTeXPK-created fonts locally, set this as appropriate and
127 % also set the 'vartexfonts' feature in MT_FEATURES in MakeTeXnames.cnf.
128 VARTEXFONTS = /var/tex/fonts
129
130 % Device-independent font metric files.
131 VFFONTS = .;$dbfonts/vf//
132 TFMFONTS = .;$dbfonts/tfm//;$VARTEXFONTS/tfm//
133
134 % The $MAKETEX_MODE below means the drivers will not use a cx font when
135 % the mode is ricoh. If no mode is explicitly specified, kpse_prog_init
136 % sets MAKETEX_MODE to /, so all subdirectories are searched. See the manual.
137 PKFONTS = .;{$dbfonts,$VARTEXFONTS}/pk/$MAKETEX_MODE//
138
139 % xdvi needs to find bitmaps for PostScript fonts, which can be
140 % generated by the standalone program gsftopk, among others.
141 PKFONTS.xdvi = .;{$dbfonts,$VARTEXFONTS}/pk/{$MAKETEX_MODE,modeless}//
142
143 % Similarly for the GF format, which only remains in existence because
144 % Metafont outputs it (and MF isn't going to change).
145 GFFONTS = .;$dbfonts/gf/$MAKETEX_MODE//
146
147 % A backup for PKFONTS and GFFONTS. Not used for anything.
148 GLYPHFONTS = .;$dbfonts
149
150 % For texfonts.map and included map files used by MakeTeXPK.
151 % See ftp://ftp.tug.org/tex/fontname.tar.gz.
152 TEXFONTMAPS = .;{$TEXMFLOCAL,$dbmain}/fontname
153
154 % BibTeX bibliographies and style files.
155 BIBINPUTS = .;{$TEXMFLOCAL,$dbmain}/bibtex/bib//
156 BSTINPUTS = .;{$TEXMFLOCAL,$dbmain}/bibtex/bst//
157
158 % MFT style files.
159 MFTINPUTS = .;{$TEXMFLOCAL,$dbmain}/mft//
160
161 % PostScript headers, prologues (.pro), encodings (.enc) and fonts.
162 TEXPSHEADERS = .;$TEXMFLOCAL/dvips;$dbmain/dvips//;$dbfonts/type1//
163
164 % PostScript Type 1 outline fonts.
165 T1FONTS = .;$dbfonts/type1//;$TEXMFLOCAL/dvips//;$dbmain/dvips//
166
167 % PostScript AFM metric files.
168 AFMFONTS = .;$dbfonts/afm//
169
170 % Dvips' config.* files (this name should not start with 'TEX'!).
171 TEXCONFIG = .;$TEXMFLOCAL/dvips;$dbmain/dvips//
172
173 % Makeindex style (.ist) files.
174 INDEXSTYLE = .;{$TEXMFLOCAL,$dbmain}/makeindex//
175

```

```

176 % Used by DMP (ditroff-to-mpx), called by makempx -troff.
177 TRFFONTS = /usr/lib/font/devpost
178 MPSUPPORT = .;{$TEXMFLOCAL,$dbmain}/metapost/support
179
180 % For xdvi to find mime.types and .mailcap, if they do not exist in
181 % $HOME. These are single directories, not paths.
182 % (But the default mime.types, at least, may well suffice.)
183 MIMELIBDIR = $prefix/etc
184 MAILCAPLIBDIR = $prefix/etc
185
186 % TeX documentation and source files, for use with kpsewhich.
187 TEXDOCS = .;{$TEXMFLOCAL,$dbmain}/doc//
188 TEXSOURCES = .;{$TEXMFLOCAL,$dbmain}/source//
189
190 % Omega-related fonts and other files.
191 OFMFFONTS = .;{$dbfonts,$VARTEXFONTS}//ofm//
192 OPLFFONTS = .;{$dbfonts,$VARTEXFONTS}//opl//
193 OVFFONTS = .;{$dbfonts,$VARTEXFONTS}//ovf//
194 OVPPFFONTS = .;{$dbfonts,$VARTEXFONTS}//ovp//
195 OTPINPUTS = .;{$TEXMFLOCAL,$dbmain}/omega/otp//
196 OCPINPUTS = .;{$TEXMFLOCAL,$dbmain}/omega/ocp//
197
198 % For MakeTeX.common, MakeTeX.site, ls-R.
199 web2cdir = {$TEXMFLOCAL,$dbmain}/web2c
200 TEXMFCNF_DIR = $TEXMFMAIN/web2c
201
202 % The MakeTeX* scripts rely on KPSE_DOT. Do not change it.
203 KPSE_DOT = .
204
205 % This definition isn't used from this .cnf file itself (that would be
206 % paradoxical), but the compile-time default in paths.h is built from it.
207 % The SELFAUTO* variables are set automatically from the location of
208 % argv[0], in kpse_set_prognam.
209 %
210 % About the /. construction;
211 % 1) if the variable is undefined, we'd otherwise have an empty path
212 %    element in the compile-time path. This is not meaningful.
213 % 2) if we used /$VARIABLE, we'd end up with // if VARIABLE is defined,
214 %    which would search the entire world.
215 %
216 % The TETEXDIR stuff isn't likely to relevant unless you're using teTeX,
217 % but it doesn't hurt.
218 %
219 TEXMFCNF = .;$SELFAUTOLOC;$SELFAUTODIR;$SELFAUTODIR/share/texmf/web2c;$SELFAUTOPARENT;\
220 $SELFAUTOPARENT/share/texmf/web2c;/.$TETEXDIR;/.{$TEXMFLOCAL,$dbmain}/web2c;$web2cdir
221
222 % Part 2; Non-path options.
223
224 % Write .log/.dvi/etc. files here, if the current directory is unwritable.
225 % TEXMFOUTPUT = /tmp
226
227 % If a dynamic file creation fails, log the command to this file, in
228 % either the current directory or TEXMFOUTPUT. Set to the
229 % empty string or 0 to avoid logging.
230 MISSFONT_LOG = missfont.log
231
232 % Set to a colon-separated list of words specifying warnings to suppress.
233 % To suppress everything, use TEX_HUSH = all; this is equivalent to
234 % TEX_HUSH = checksum;lostchar;readable;special

```

```
235  TEX_HUSH = 0
236
237  % Enable system commands via \write18{...}?
238  shell_escape = 0
239
240  % Allow TeX \openout on filenames starting with '.' (e.g., .rhosts)?
241  openout_any = 0
242
243  % Enable the MakeTeX... scripts by default? These must be set to 0 or 1.
244  % Particular programs can and do override these settings, for example
245  % dvips's -M option. Your first chance to specify whether the scripts
246  % are invoked by default is at configure time.
247  %
248  % These values are ignored if the script names are changed; e.g., if you
249  % set DVIPSMAKEPK to 'foo', what counts is the value of the environment
250  % variable/config value 'FOO', not the 'MAKETEXPK' value.
251  %
252  % MAKETEXTEX = 0
253  % MAKETEXPK = 0
254  % MAKETEXMF = 0
255  % MAKETEXTFM = 0
256
257  % What MetaPost runs to make MPX files. This is passed an option -troff
258  % if MP is in troff mode. Set to '0' to disable this feature.
259  MPXCOMMAND = makempx
260
261  % Part 3; Array and other sizes for TeX (and Metafont and MetaPost).
262  %
263  % If you want to change some of these sizes only for a certain TeX
264  % variant, the usual dot notation works, e.g.,
265  % main_memory.hugetex = 20000000
266  %
267  % If a change here appears to be ignored, try redumping the format file.
268
269  % Memory. Must be less than 8,000,000.
270  %
271  % main_memory is relevant only to initex, extra_mem_* only to non-ini.
272  % Thus, have to redump the .fmt file after changing main_memory; to add
273  % to existing fmt files, increase the other. (To get an idea of how
274  % much, try \tracingstats=2 in your TeX source file;
275  % web2c/tests/memtest.tex might also be interesting.)
276  %
277  % To increase space for boxes (as might be needed by, e.g., PiCTeX),
278  % increase extra_mem_bot.
279  %
280  main_memory = 263000 % words of memory available; also applies to mf&mp
281  main_memory.hugetex = 1100000
282  extra_mem_top = 0    % extra high memory for chars, tokens, etc.
283  extra_mem_bot = 0    % extra low memory for boxes, glue, breakpoints, etc.
284
285  % Words of font info for TeX (total size of all TFM files, approximately).
286  font_mem_size = 100000
287  font_mem_size.hugetex = 400000
288  font_mem_size.pdfTeX = 400000
289
290  % Total number of fonts. Must be >= 50 and <= 2000 (without tex.ch changes).
291  font_max = 500
292  font_max.hugetex = 900
293
```

```

294 % Extra space for the hash table of control sequences (which allows 10K
295 % names as distributed).
296 hash_extra = 0
297 hash_extra.hugetex = 10000
298 hash_extra.pdfTEX = 10000
299
300 % Max number of characters in all strings, including all error messages,
301 % help texts, font names, control sequences. These values apply to TeX and MP.
302 pool_size = 125000
303 pool_size.hugetex = 500000
304 pool_size.pdfTEX = 500000
305 % Minimum pool space after TeX/MP's own strings; must be at least
306 % 25000 less than pool_size, but doesn't need to be nearly that large.
307 string_vacancies = 25000
308 string_vacancies.hugetex = 45000
309 string_vacancies.pdfTEX = 45000
310 max_strings = 15000           % max number of strings
311 max_strings.hugetex = 55000   % max number of strings
312 max_strings.pdfTEX = 55000   % max number of strings
313 pool_free = 5000             % min pool space left after loading .fmt
314
315 % Hyphenation trie. As distributed, the maximum is 65535; this should
316 % work unless 'unsigned short' is not supported or is smaller than 16
317 % bits. This value should suffice for UK English, US English, French,
318 % and German (for example). To increase, you must change
319 % 'ssup_trie_opcode' and 'ssup_trie_size' in tex.ch (and rebuild TeX);
320 % the trie will then consume four bytes per entry, instead of two.
321 %
322 % US English, German, and Portuguese; 30000.
323 % German; 14000.
324 % US English; 10000.
325 %
326 trie_size = 64000
327
328 hyph_size = 1000             % number of hyphenation exceptions, >610 and <32767.
329 buf_size = 3000              % max length of input lines or control sequence names
330 nest_size = 100              % simultaneous semantic levels (e.g., groups)
331 max_in_open = 15             % simultaneous input files and error insertions
332 param_size = 500             % simultaneous macro parameters
333 save_size = 4000             % for saving values outside current group
334 save_size.pdfTEX = 30000     % for saving values outside current group
335 save_size.hugetex = 30000    % for saving values outside current group
336 stack_size = 300             % simultaneous input sources
337
338 % These work best if they are the same as the I/O buffer size, but it
339 % doesn't matter much. Must be a multiple of 8.
340 dvi_buf_size = 16384 % TeX
341 gf_buf_size = 16384 % MF
342
343 % It's probably inadvisable to change these. At any rate, we must have:
344 % 45 < error_line < 255;
345 % 30 < half_error_line < error_line - 15;
346 % max_print_line < 60 ;
347 % These apply to Metafont and MetaPost as well.
348 error_line = 79
349 half_error_line = 50
350 max_print_line = 79

```

B Catalogue of Packages

Table 1: **T_EX** Live packages

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|---|
| a4 | latex3 | Originally for L ^A T _E X 2.09 but updated for L ^A T _E X 2 _ε . Mostly superseded by L ^A T _E X 2 _ε support for a4 paper but defines the extra option of widemargins. The geometry package is usually better. |
| aiaa | latex3 | A bundle of L ^A T _E X/BIBT _E X files and sample documents to aid those producing papers and journal articles according to the guidelines of the American Institute of Aeronautics and Astronautics (AIAA) |
| achemso | latex3 | L ^A T _E X and BIBT _E X style for American Chemical Society |
| acronym | latex3 | This package ensures that all acronyms used in the text are spelled out in full at least once. It also provides an environment to build a list of acronyms. |
| adrlist | latex3 | Using address lists in L ^A T _E X. |
| aguplus | latex3 | Styles for American Geophysical Union. |
| alatex | formats3 | An extended L ^A T _E X with better modularity |
| alg | latex3 | L ^A T _E X environments for typesetting algorithms |
| algorithms | latex3 | Defines a floating algorithm environment designed to work with the algorithmic package. |
| alpha-linux | systems1 | System binaries for Alpha running Linux. |
| alpha-osf3.2 | systems1 | System binaries for Alpha running OSF 3.2. |
| altfont | latex3 | A generalised replacement for some parts of psnfss and mfnfss. Similar to psfont with the PostScript specific code removed. |
| amiweb2c | systems1 | An Amiga port of the complete UNIX-TeX system. |
| amsfonts | ams2 | A set of miscellaneous T _E X fonts from the American Mathematical Society that augment the standard set normally distributed with T _E X. The set includes: Extra mathematical symbols; Blackboard bold letters (uppercase only); Fraktur letters; Subscript sizes of bold math italic and bold Greek letters; Subscript sizes of large symbols such as sum and product; Added sizes of the Computer Modern small caps font; Cyrillic fonts (from the University of Washington); Euler math fonts. |
| amslatex | ams2 | A collection of loosely related files that are distributed together by the American Mathematical Society. These files are miscellaneous enhancements to L ^A T _E X whose aim is superior information structure of mathematical documents and superior printed output. |
| amstex | ams2 | American Mathematical Society plain T _E X macros |
| answers | latex3 | Styles for setting questions (or exercises) and answers. |
| apa | latex3 | L ^A T _E X class and BIBT _E X style used to format text according to the American Psychological Association Publication Manual (4th ed.) specifications for manuscripts or, with an option to the package, in an APA journal style format or as a regular document. |
| apl | fonts3 | Fonts for typesetting APL programs. |
| arabtex | lang3 | Macros and fonts for typesetting Arabic |
| arseneau | latex2 | Miscellaneous macros by Donald Arseneau. |
| ascii | fonts3 | Support for IBM extended ASCII font. |
| astro | fonts3 | Astronomical (planetary) symbols. |
| aurora | dvips3 | Header files for dvips to make colour separations |
| autotab | latex3 | Generating tabular setups. |
| babel | latex1 | Multilingual support for L ^A T _E X. |
| backgammon | fonts3 | Style for typesetting backgammon boards. |
| bakoma | fonts2 | Computer Modern and AMS fonts in PostScript Type1 form. |
| barcodes | fonts3 | Fonts for making barcodes. |
| barr | graphics3 | Diagram macros by Michael Barr. |
| base | latex1 | Basic L ^A T _E X system. |
| bbding | fonts3 | An NFSS-interface to the symbol font bbding containing many of the Zapf dingbats fonts. |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|--|
| bbm | fonts3 | Blackboard variant fonts for Computer Modern, with L ^A T _E X support |
| bbtbase | bibtex1 | Basic B _I T _E X styles. |
| bbtdoc | bibtex2 | Basic B _I T _E X documentation/ |
| beebe | bibtex2 | Nelson Beebe's collection of T _E X-related bibliographies, and B _I T _E X style files |
| beton | latex3 | Typeset a L ^A T _E X 2 _ε document with the Concrete fonts designed by Don Knuth and used in his book "Concrete Mathematics". |
| biblist | latex3 | B _I T _E X styles by Joachim Schrod. |
| blue | formats3 | Kees van der Laan's BLUe format, a concise but expressive document preparation system modelled on Knuth's manmac |
| bm | latex2 | This is a package for accessing bold symbols in math mode. (Similar to the AMS <code>\boldsymbol</code> command, but taking more care over spacing, delimiters etc.). |
| booktabs | latex2 | Nicer layout of tables |
| borceux | graphics3 | Diagram macros by Francois Borceux |
| bridge | latex3 | Macros for typesetting Bridge diagrams. |
| calc | latex2 | Adds infix expressions to perform arithmetic in the L ^A T _E X commands <code>\setcounter</code> , <code>\addtocounter</code> , <code>\setlength</code> , and <code>\addtolength</code> . |
| calendar | plain3 | Plain macros for making nice calendars |
| calrfs | latex3 | Nicer calligraphic letters. |
| camel | latex3 | Comprehensive bibliography manager (prototype citation engine for L ^A T _E X3). Will become B _I T _E X 1.0 on release. Under development. |
| caption | latex2 | Extends caption capabilities for figures and tables, such as the caption width, style, font. Many aspects are tunable as options. |
| carlisle | latex2 | Miscellaneous small packages by David Carlisle |
| ccfonts | latex | L ^A T _E X support for Concrete fonts. |
| cchess | fonts3 | Macros and fonts for typesetting Chinese Chess board diagrams. |
| cellular | plain3 | Cellular table construction |
| changebar | latex2 | Generate changebars in L ^A T _E X documents. |
| chemcono | latex3 | A L ^A T _E X style file for using compound numbers in chemistry documents. It works like <code>\cite</code> and the <code>\thebibliography</code> , using <code>\fcite</code> and <code>\theffbibliography</code> instead. It allows compound names in documents to be numbered and does not affect the normal citation routines. |
| chemsym | latex3 | Macros for typing chemical symbols |
| cheq | fonts3 | Adobe chess font. |
| cherokee | fonts3 | Fonts for Cherokee scripts |
| chess | fonts3 | Fonts for typesetting chess boards. |
| circ | graphics3 | Macros for typesetting circuit diagrams. Several electrical symbols like resistor, capacitor, transistors etc., are defined. The symbols can be connected with wires. |
| circuit | graphics3 | Language for drawing circuit diagrams. |
| cirth | fonts3 | Fonts for Cirth |
| cite | latex2 | Supports compressed, sorted lists of numerical citations: [8,11-16]. |
| cm | fonts1 | Computer Modern fonts |
| cmbright | fonts2 | Computer Modern Bright fonts |
| cmcyralt | latex3 | Alternative Russian encoding support |
| cmextra | fonts2 | Extra Computer Modern fonts, from the American Mathematical Society |
| cmpica | fonts3 | A Computer Modern Pica variant |
| cmps | fonts2 | Type1 versions of PostScript fonts, from Blue Sky and Y&Y. |
| codepage | latex3 | Support for variant code pages. |
| colorsep | dvips3 | Support for colour separation when using dvips |
| concmath | fonts3 | Concrete math fonts derived from Computer Modern math fonts using parameters from Concrete text fonts. A L ^A T _E X package providing the necessary font definition code is included. |
| concrete | fonts3 | Concrete fonts |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|--|
| context | generic3 | ppchtex is a package that can be used to typeset chemical formulas. The package is a separate module of the context macro package for T _E X (context is a full featured, parameter driven macro package, which fully supports advanced interactive documents). |
| countlto | latex3 | Setting \count1 to \count9 |
| croatian | lang3 | Fonts for typesetting Croatian scripts |
| crosswrđ | latex3 | Macros for typesetting crossword puzzles. |
| csfonts | fonts2 | Czech/Slovak-tuned METAFONT Computer Modern fonts. |
| cslatex | latex | L ^A T _E X support for Czech/Slovak typesetting. |
| csplain | plain2 | Plain T _E X support for Czech/Slovak typesetting. |
| curves | graphics3 | Draws curves in the L ^A T _E X picture environment using parabolas between points with continuous slope at points. Equivalent to technical pens with compasses and French curves. |
| custom-bib | latex2 | Package generating customized BIBT _E X bibliography styles from a generic file using docstrip. |
| dancers | fonts3 | Font for the Sherlock Holmes ‘Dancing Men’ |
| dates | latex3 | Macros for parsing date strings. |
| deleg | latex3 | Provides a more flexible numbering of equations, subequations, and ‘recycled’ equations, including ‘partial’ equation numbers (‘3a’, ‘3b’ etc.). |
| devanagari | lang3 | Fonts for typesetting Devanagari |
| dialogl | latex3 | Macros for constructing interactive L ^A T _E X scripts |
| dinbrief | latex3 | German letter DIN style. |
| doc1 | texlive1 | Basic documentation for T _E X Live. |
| doc2 | texlive2 | Recommended documentation for T _E X Live. |
| dotseqn | latex3 | Flush left equations with dotted letters to the numbers |
| draftcopy | latex3 | Places the word DRAFT (or other words) in light grey diagonally across the background (or at the bottom) of each (or selected) pages of the document. |
| dratex | graphics3 | General drawing macros entirely in T _E X |
| dropping | latex3 | A L ^A T _E X 2 _ε macro for dropping the first character(s) (or word(s)) of a paragraph. This is an extension of the L ^A T _E X 2.09 package dropcaps. This package automatically takes care of finding the font name. |
| dtk | latex3 | Macros for the DANTE publication. |
| duerer | fonts3 | Computer Duerer fonts. |
| dvips | generic1 | Tom Rokicki’s dvi to PostScript driver |
| dvipsbas | dvips1 | Basic support files for dvips. |
| ean | generic3 | Font for making EAN barcodes. |
| easy | latex3 | Macros for simplifying the writing of equations. |
| ec | fonts2 | The ec fonts support the complete L ^A T _E X T1 encoding, as defined at the 1990 TUG conference hold at Cork/Ireland. They are intended to be as stable as the cm fonts are, i.e., there shall be no more changes to the tfm files. The ec fonts also contain a Text Companion Symbol font, called tc, featuring many useful characters needed in typesetting, for example oldstyle digits, currency symbols (including the newly created Euro symbol), the permille sign, copyright, trade mark and servicemark as well as a copleft sign, and many others. Recent releases of L ^A T _E X 2 _ε support the ec fonts. The dc fonts, which were termed as preliminary versions, will disappear from the archives. |
| ecc | fonts3 | ‘European’ (T1 encoded) version of the Concrete fonts. |
| edmac | plain3 | A macro package for typesetting scholarly critical editions |
| eepic | graphics2 | A set of T _E X macros for L ^A T _E X implementing several extensions to EPIC and the L ^A T _E X picture drawing environment, including the drawing of lines at any slope, the drawing of circles in any radii, and the drawing of dotted and dashed lines much faster with much less T _E X memory, and providing several new commands for drawing ellipses, arcs, splines, and filled circles and ellipses. |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|---|
| eiad | latex3 | Macros and EIAD fonts. |
| elsevier | latex3 | Preprint style for Elsevier Science journals |
| elvish | fonts3 | Font for typesetting Tolkien Elvish script |
| endfloat | latex3 | Place all figures on pages by themselves at the end of the document with markers like “[Figure 3 about here]” appearing in the text (by default) near to where the figure (or table) would normally have occurred. |
| engwar | fonts3 | Font for typesetting Tolkien Engwar script, by Michael Urban |
| envelop | latex3 | Printing addresses on envelopes |
| envelop | latex3 | A \LaTeX 2 ϵ package for producing mailing envelopes and labels, including barcodes and address formatting according to the US Postal Service rules. Redefines the standard <code>\makeaddress</code> command of the \LaTeX 2 ϵ letter documentclass. |
| eplain | formats2 | Simple but powerful extended version of the plain format, adding support for bibliographies, tables of contents, enumerated lists, verbatim input of files, numbered equations, tables, two-column output, footnotes and commutative diagrams. |
| epslatex | doc2 | An extensive document which explains how to use Encapsulated PostScript (EPS) files in \LaTeX 2 ϵ documents. Includes explanations of Bounding Boxes, and more. |
| eqname | latex3 | Style for different equation numbering. |
| eqnarray | latex3 | More generalised equation arrays with numbering. |
| euler | latex3 | Provides a setup for using the AMS Euler family of fonts for math in \LaTeX documents. “The underlying philosophy of Zapf’s Euler design was to capture the flavor of mathematics as it might be written by a mathematician with excellent handwriting.” [concrete-tug] The euler package is based on Knuth’s macros for the book “Concrete Mathematics”. The text fonts for the Concrete book are provided by the beton package. |
| everydel | latex3 | \LaTeX package which provides hooks into <code>\selectfont</code> . |
| everyshi | latex3 | Hooks for taking action at every <code>\shipout</code> |
| exam | latex3 | Package for typesetting exam scripts. |
| exams | latex3 | Exam questions can be multiple choice or free form long/short answer questions. Options include the typesetting of the exam itself, an exam showing all the answers and a collection of questions and answers. Questions can be parametrized. Use of a random generator provides for automatic shuffling of multiple choice items. |
| expdlist | latex3 | Expanded description environments |
| export | latex3 | This package allows the user to export/import the values of \LaTeX registers (counters, rigid and rubber lengths only). It is definitely NOT for faint-hearted users. |
| fancyhdr | latex3 | Support for sophisticated control of page headers and footers in \LaTeX 2 ϵ . It supersedes fancyheadings. |
| fancyheadings | latex2 | Better control over page headers and footers in \LaTeX . This is an up-to-date version for \LaTeX . For \LaTeX 2 ϵ it is now called fancyhdr. |
| fancyvrb | latex2 | Sophisticated handling of verbatim text, to write it out, read it in, and typeset it |
| fax | latex3 | Document class for preparing faxes. |
| fc | fonts3 | Fonts for African languages, complementary to Computer Modern. |
| feynmf | graphics3 | Macros and fonts for creating Feynman (and other) diagrams. |
| float | latex2 | Improves the interface for defining floating objects such as figures and tables. Introduces the boxed float and the ruled float. You can define your own floats and improve the behaviour of the old ones. Also incorporates the H option of the superseded here package. You can select this as automatic default with <code>\floatplacement{figure}{H}</code> . |
| floatfig | latex3 | Allows text to be wrapped around figures. |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|-------------------|-------------------|---|
| floatflt | latex3 | Float text around figures and tables which do not span the full width of a page. This is an improved version of floatfig. It is more or less similar to floatingtable. The tables/figures can be set left/right or alternating on even/odd pages. Works with the multicol package. Doesn't work well in the neighbourhood of list environments unless you change your L ^A T _E X document. |
| fncychap | latex3 | This package provides six predefined chapter headings. Each can be modified using a set of simple commands. Optionally one can modify the formatting routines in order to create additional chapter headings. This package was previously known as FancyChapter. |
| foiltex | latex3 | A L ^A T _E X 2 _ε class for overhead transparencies. Can be used with fancybox to place a variety of borders around the slides. |
| fontinst | latex3 | T _E X macros for converting Adobe Font Metric files to T _E X metric and virtual font format |
| fontmisc | fonts1 | Miscellaneous METAFONT input files |
| fontname | texlive1 | Karl Berry's scheme for naming fonts in T _E X |
| fonts | latex1 | Extra line and circle fonts for L ^A T _E X |
| footnote | latex3 | More sophisticated footnotes. |
| footnpag | latex3 | Allows footnotes on individual pages to be numbered from 1, rather than being numbered sequentially through the document. |
| formats | texlive2 | Prebuilt T _E X format and METAFONT base files |
| fp | latex3 | Provides an extensive collection of arithmetic operations for fixed point real numbers of high precision. |
| french | lang2 | Style for French typography |
| fribrief | latex3 | A L ^A T _E X class for writing letters. |
| fundus | latex3 | Providing L ^A T _E X access to various font families. |
| futhark | fonts3 | Fonts for the Older Futhark script |
| g-brief | latex3 | A document class for L ^A T _E X 2 _ε . Serves for formatting formless letters in german or english language. |
| gb4e | latex3 | Government Binding styles. |
| general | doc1 | Useful general documentation. |
| genmisc | generic3 | Miscellaneous small files for all formats, specific to the T_EX Live CD-ROM. |
| geometry | latex3 | A package which allows L ^A T _E X 2 _ε users to customise page layout (page sizes) using an easy and flexible user interface. You can specify <code>\geometry{body={6.5in,8.75in}, top=1.2in, left=2cm, nohead}</code> . This is an update of the now superseded pagesize package. |
| german | latex2 | Style for German typography. |
| germbib | bibtex2 | German variants of standard B _I B _T E _X styles. |
| go | fonts3 | Fonts and macros for typesetting go games. |
| gothic | fonts3 | Gothic and ornamental initial fonts by Yannis Haralambous. |
| graphics | latex2 | The primary L ^A T _E X package for the support of the inclusion of graphics generally produced with other tools. This package aims to give a consistent interface to including the file types that are understood by your printer driver. |
| gray | fonts3 | Fonts for gray scales |
| hands | fonts3 | Pointing hand fonts |
| harpoon | latex3 | Extra harpoons, using the graphics package |
| harvard | bibtex2 | The Harvard bibliography style family. |
| harvmac | plain3 | Paul Ginsparg's Harvard macros for scientific articles |
| hh | latex3 | Fancy boxing effects |
| histogr | latex3 | Drawing histograms with the L ^A T _E X picture environment. |
| hppa1.1-hpux10.20 | systems1 | System binaries HP running hpux10.20. |
| hppa1.1-hpux9.05 | systems1 | System binaries HP running hpux9.05. |
| html | doc2 | Various T _E X documentation converted to HTML |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|-----------------|-------------------|--|
| hyper | latex3 | Redefines \LaTeX cross-referencing commands to insert <code>\special</code> commands for HyperTeX dvi viewers |
| hyperref | latex3 | Redefines \LaTeX cross-referencing commands to insert <code>\special</code> commands for HyperTeX dvi viewers, or translation to Acrobat. |
| hyphen | lang1 | Collection of hyphenation patterns. |
| i386-linux | systems1 | System binaries for Intel machines running Linux. |
| i586-freebsd2.2 | systems1 | System binaries for Intel PC running FreeBSD 2.2. |
| i686-linux | systems1 | System binaries for Intel Pentium Pro running Linux. |
| ieeepes | latex3 | Allows typesetting of transactions, as well as discussions and closures, for the IEEE Power Engineering Society Transactions journals. |
| ifacmtg | latex3 | Elsevier Science preprint style for IFAC meetings. |
| indxcite | latex3 | A package to automatically generate an Author Index based on citations made using \BIBTeX . It requires the use of the harvard and index packages and $\LaTeX 2_{\epsilon}$. |
| info | doc2 | Documentation in GNU info form |
| inputenc | latex3 | Controlling input encoding |
| ipa | latex3 | Style for using International Phonetic Alphabet fonts |
| isostds | latex3 | Class and package files for typesetting ISO International Standard documents. Several standard documents have been printed by ISO from camera-ready copy prepared using \LaTeX and these files. One set of files is for generic ISO typesetting and the other is an extension set of packages for typesetting ISO 10303 standards. |
| jadetex | latex3 | Macro package on top of \LaTeX to typeset \TeX output of Jade DSSSL implementation. |
| jknappen | latex2 | Miscellaneous macros, mostly for making use of extra fonts, by Jörg Knappen. |
| jsmisc | plain3 | Miscellaneous useful macros by Joachim Schrod. |
| jura | latex3 | A document class for German law students. |
| knuth | doc3 | Knuth's own documentation, including the \TeX book and the METAFONTbook |
| koma-script | latex3 | A replacement for the article/report/book classes with emphasis on European rules of typography and paper formats as laid down by Jan Tschichold. |
| kuvio | graphics3 | Drawing macros and fonts for diagrams. |
| labels | latex3 | Support for printing sheets of sticky labels (but could also be used for business cards). The number of rows and columns of labels, and their size, can be changed. |
| lamstex | formats3 | A merge of the best in \AMSTeX and \LaTeX |
| lastpage | latex3 | Reference the number of pages in your \LaTeX document (as in a page footer that says: Page N of M). |
| lgreek | latex3 | Macros for using Silvio Levy's Greek fonts |
| lineno | latex3 | Adds line numbers to selected paragraphs with reference possible through the \LaTeX <code>\ref</code> and <code>\pageref</code> cross reference mechanism. Version 2.00 supports numbering of one in five lines and switching the line numbers from the left to the right side of the page in twoside mode. |
| listings | latex3 | Package for pretty-printed program listings, with support for a range of languages. |
| localloc | latex3 | Macros for localizing \TeX register allocations |
| logic | fonts3 | METAFONT font for drawing logic diagrams. |
| lollipop | formats3 | A new generation format |
| lshort | latex1 | Short introduction to \LaTeX . |
| ltablex | latex3 | Modifies the tabularx environment to combine the features of the tabularx package (auto-sized columns in a fixed width table) with those of the longtable package (multi-page tables). |
| ltxdoc | latex1 | Class for documented $\LaTeX 2_{\epsilon}$ classes. |
| ltxmisc | latex2 | Miscellaneous \LaTeX styles. |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|---|
| lw35ps | fonts2 | Font metrics and L ^A T _E X font description files for standard 35 PostScript fonts. |
| ly1 | latex3 | Support for LY1 L ^A T _E X encoding, i.e. the Y&Y texnansi encoding. |
| mab-nextstep3 | systems1 | System binaries for Next boxes running NextStep 3. |
| mailing | latex3 | Macros for mail merging |
| makeindex | texlive1 | Documentation for the MakeIndex program. |
| malvern | fonts3 | A new sans-serif font family |
| mapcodes | latex3 | Support for multiple character sets and encodings. |
| maple | latex3 | Styles and examples for the MAPLE newsletter. |
| mathcomp | latex2 | A package which provides access to some interesting characters of the Text Companion fonts (TS1 encoding) in math mode. |
| mcite | latex3 | Support for collapsing multiple citations into one, as customary in physics journals |
| mdwtools | latex3 | Miscellaneous tools by Mark Wooding, including support for @, a doafter command, footnotes, mathenv for various alignment in maths, list handling, trivial maths oddments, rewrite of L ^A T _E X's <code>tabular</code> and <code>array</code> environments, verbatim handling, and syntax diagrams. |
| mff | latex3 | A package to provide something similar to 'multiple master' fonts, but using METAFONT; you specify a font by a set of METAFONT parameters, and T _E X makes up a .mf file to generate the required font; this package is not integrated with NFSS (or MakeTeXTFM) yet fun. |
| mflogo | latex1 | L ^A T _E X package and font definition file to access the Knuthian 'logo' fonts described in 'The METAFONTbook' and the METAFONT and MetaPost logos in L ^A T _E X documents. |
| mfmisc | fonts1 | Small support files for METAFONT. |
| mfnfss | latex3 | Font description files for extra fonts like yinit and ygoth |
| mfpic | graphics3 | Macros which generate METAFONT code for drawing pictures. |
| mftoeps | fonts3 | a METAFONT package for generating (encapsulated PostScript) files readable by CorelDRAW!, Adobe Illustrator and Fontographer. METAFONT writes PostScript code to a LOG-file, and from the LOG-file the code can be extracted by either T _E X or AWK. DOS batch files, T _E X source, and AWK source are placed in the subdirectory PROGS. |
| midnight | generic3 | A set of useful macro tools |
| minitoc | latex3 | Table of contents per chapter. |
| mips-irix4.0.5 | systems1 | System binaries for SGI box running Irix 4.0.5. |
| mips-irix5.3 | systems1 | System binaries for SGI box running Irix 5.3. |
| mips-irix6.3 | systems1 | System binaries for SGI box running Irix 6.3. |
| mips-ultrix4.4 | systems1 | System binaries for MIPS machine running Ultrix 4.4. |
| misc | latex3 | Miscellaneous small macro files for L ^A T _E X. |
| misc209 | latex2 | Miscellaneous small macro files for L ^A T _E X2.09. |
| mnras | plain3 | Styles for the Monthly Notices of the Royal Astronomical Society. |
| monster | latex3 | Towards a more rational and modular L ^A T _E X, by Matt Swift; a set of powerful tools |
| moreverb | latex3 | A verbatim mode that can handle TABs properly, can number lines, can number lines in an included file, can produce boxed verbatims, etc. |
| mpbase | metapost1 | Basic MetaPost support files. |
| mpfnmark | latex3 | A package which provides the command <code>\mpfootnotemark</code> , which can be used in the same way as <code>\footnotemark</code> . The difference between these two macros is that within minipage environments the latter uses the standard footnote marker style (defined by <code>\thefootnote</code>), while the new command uses the minipage footnote marker style (defined by <code>\thempfootnote</code>). |
| mslapa | latex3 | L ^A T _E X and B ^I B _T E _X style files for a respectably close approximation to APA (American Psychological Association) citation and reference style. |
| mtbe | plain3 | Examples from <i>Mathematical T_EX by Example</i> by Arvind Borde |
| musictex | generic3 | Typesetting music with T _E X. |
| musixtex | generic3 | Extended MusicT _E X, with better slurs |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|---|
| myletter | latex3 | Another letter package. |
| nassflow | latex3 | Drawing Nassi-Schneidermann diagrams. |
| natbib | bibtex2 | A bibliography style that handles author-year and numbered references. |
| newalg | latex3 | Format algorithms like Cormen, Leiserson and Rivest. |
| newsletr | plain3 | Macros for making newsletters |
| newthm | latex3 | A modified version of the theorem-style which provides generation of lists of theorems. |
| niceframe | latex3 | Support for fancy framing of pages |
| nomenc1 | latex3 | Nomenclature package for producing lists of symbols using the capabilities of the MakeIndex program. |
| ntgclass | latex2 | Versions of the standard L ^A T _E X article and report classes, rewritten to reflect a more European design, by the Dutch T _E X Users Group |
| numline | latex3 | Macros for numbering lines. |
| objectz | latex3 | Macros for typesetting Object Z |
| oca | fonts3 | OCR font |
| ocr-a | fonts3 | Fonts for OCR-A |
| ocr-b | fonts3 | Fonts for OCR-A |
| ogham | fonts3 | Fonts for typesetting Ogham script |
| ogonek | latex3 | Support for Polish typography and the ogonek |
| oldstyle | latex3 | Font information needed to load the <i>cmi</i> and <i>cmib</i> fonts for use to produce oldstyle numbers |
| osmanian | fonts3 | Osmanian fonts by Alan Stanier for writing Somali |
| ot2cyr | fonts2 | Macros to use to the OT2 Cyrillic encoding |
| overword | latex3 | This package provides two macros which can be used as building blocks for the parsing of text. For an example of their use, see the calendar package. |
| pandora | fonts3 | The Pandora font family |
| paper | latex3 | A class derived from article, tuned for producing papers for journals. Introduces new layout options and font commands for sections/parts. Defines a new keywords environment, and subtitle and institution commands for the title section. New commands for revisions. And more. |
| parallel | latex3 | Provides a parallel environment which allows two columns of text to be typeset. Useful for typesetting two languages side-by-side. |
| patch | latex3 | Macros for package management. |
| pb-diagram | latex3 | Diagram package, using LAMST _E X fonts, by Paul Burchard. |
| pdcmac | plain3 | Damian Cugley's macro tools. |
| pdf | doc2 | Documentation in PDF format. |
| pdftex | plain2 | Macro packages for variant T _E X which writes PDF format. |
| phonetic | fonts3 | METAFONT Phonetic fonts, based on Computer Modern |
| physe | formats3 | PHYSE format |
| phyzzx | formats3 | A T _E X format for physicists |
| picinpar | latex3 | Insert pictures into paragraphs. (NOTE: Piet van Oostrum does not recommend this package. Picins is recommended instead.) |
| pictex | graphics2 | Picture drawing macros for L ^A T _E X. |
| piff | latex3 | Macro tools by Mike Piff |
| plainmisc | plain1 | Miscellaneous useful macros for plain T _E X |
| plaintex | plain1 | Basic Plain T _E X macros |
| plfonts | fonts3 | Computer Modern variant fonts for Polish |
| plgraph | generic3 | L ^A T _E X graphics package with wrapper to allow it to be used with generic plain T _E X |
| pmgraph | latex3 | A set of extensions to L ^A T _E X picture environment, including a wider range of vectors, and a lot more box frame styles. |
| poligraf | generic3 | Page preparation for prepress, color separation, crop-marks, color and gray scale bars, booklet preparation, etc. |
| prelim2e | latex3 | Allows the marking of preliminary versions of a document |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|---|
| prettyref | latex3 | Additional functionality to L ^A T _E X 2 _ε label-reference mechanism. It allows the author to “preformat” all types of labels. |
| progkeys | latex3 | The file ‘programs.sty’ is intended to allow a parameterized way of typesetting programs with T _E X/L ^A T _E X commands inside. The file ‘keywords.sty’ allows use and define sets of keywords that will be typeset with different fonts, according to the wish of the user. |
| program | latex3 | Typesetting programs and algorithms |
| proofs | latex3 | Macros for building proof trees. |
| psfonts | fonts2 | PostScript fonts for use with T _E X and L ^A T _E X. |
| psfrag | graphics2 | A set of macros and a PostScript header which allows L ^A T _E X constructions (equations, picture environments, etc.) to be precisely superimposed over Encapsulated PostScript figures. The user can use his/her favorite drawing tool to create an EPS figure, placing simple text “tags” where each replacement is to be placed. PSfrag will automatically remove those tags from the figure and replace them with the L ^A T _E X construction that the user specifies, properly aligned, scaled, and/or rotated. |
| psizzl | formats3 | A T _E X format from SLAC |
| pslatex | latex2 | A small package that makes L ^A T _E X default to ‘standard’ PostScript fonts. It is basically a merger of the times and mathptm styles from the psnfss suite of packages. You must have installed standard L ^A T _E X and PSNFSS PostScript fonts to use this package. The main novel feature is that the pslatex package tries to compensate for the visual differences between the Adobe fonts by scaling Helvetica by 90%, and ‘condensing’ Courier (i.e. scaling horizontally) by 85%. The package is supplied with a (unix) shell file for a ‘pslatex’ command that allows standard L ^A T _E X documents to be processed, without needing to edit the file. |
| psnfss | fonts2 | Font definition files, macros and font metrics for common PostScript fonts |
| psnfssx | latex3 | Extra styles and encodings for PS fonts, including Y&Y encoding support. |
| pspicture | latex2 | Replacement for core L ^A T _E X picture macros to use PostScript <code>\special</code> commands |
| pstricks | graphics2 | An extensive collection of PostScript macros that is compatible with most T _E X macro packages, including Plain T _E X, L ^A T _E X, AMS-T _E X, and AMS-L ^A T _E X. Included are macros for color, graphics, pie charts, rotation, trees and overlays. It has many special features, including: a wide variety of graphics (picture drawing) macros, with a flexible interface and with color support. There are macros for coloring or shading the cells of tables. |
| punk | fonts3 | Donald Knuth’s punk font |
| qobitree | graphics3 | L ^A T _E X macros for typesetting trees |
| qsymbols | latex3 | For defining systematic mnemonic abbreviations, starting with ‘ for math symbols and \” for arrows, from the amssymb and stmaryrd packages |
| ragged2e | latex3 | L ^A T _E X package which defines new commands <code>\Centering</code> , <code>\RaggedLeft</code> , and <code>\RaggedRight</code> and new environments Center, FlushLeft, and FlushRight, which set ragged text and are easily configurable to allow hyphenation. |
| rccs | latex3 | Use RCS (revision control system) tags in L ^A T _E X documents. |
| realcalc | plain3 | Macros for real arithmetic calculations. |
| refman | latex3 | Variant report and article styles |
| revtex | latex2 | Styles for American Physical Society, American Institute of Physics, and Optical Society of America. Only works in compatibility mode under L ^A T _E X 2 _ε . |
| rlepf | generic3 | A macro package for use with epsf.tex which allows PostScript labels in an eps file to be replaced by T _E X labels. |
| rotating | latex2 | A package built on the standard L ^A T _E X graphics package to perform all the different sorts of rotation one might like, including complete figures and tables and captions. |
| rofloat | latex3 | Rotate floats. |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|------------------|-------------------|---|
| rplain | latex3 | Redefines the ‘plain’ pagestyle. The page numbers are now in the lower right corner. |
| rs6000-aix3.2.5 | systems1 | System binaries for RS6000 running AIX 3.2.5. |
| rs6000-aix4.1.1 | systems1 | System binaries for RS6000 running AIX 4.1.1. |
| sauter | fonts3 | Extensions to the CM fonts, providing a parameterization scheme to build fonts at true design sizes |
| scale | latex3 | A package to scale a document by $\sqrt{2}$. This is useful if you are preparing a document on e.g. A5 paper and want to print on A4 paper to achieve a better resolution. |
| script | latex3 | Variant report / book styles |
| semantic | latex3 | Eases the typesetting of notation of semantics and compilers. Includes T-diagrams, various derivation symbols and inference threes. |
| seminar | latex2 | Produce overhead slides (transparencies) with bells and whistles. |
| setspace | latex3 | Provides commands and environments for doing double and one-and-a-half line spacing based on pt size. If a different spacing is required then the <code>\setstretch{baselinestretch}</code> command is supported. The spacing environment takes one argument which is the baselinestretch to use, e.g., <code>\begin{spacing}{2.5}</code> . |
| shadbox | latex3 | A tool to shade the background of any box – text, figure, table etc. – using Plain (L)T _E X. |
| shadethm | latex3 | Package that allows declarations of the form <code>\newshadetheorem{thm}{Theorem}</code> or <code>\newshadetheorem{}[]{} or \newshadetheorem{}[]{} to produce shaded boxes from the usual command \begin{theorem} ... \end{theorem}</code> . The color package is required. |
| showlabels | latex3 | Show label commands in the margin. |
| siam | generic3 | Styles for SIAM publications |
| siggraph | latex3 | Document class for formatting papers according to the specifications for submission to the annual ACM Siggraph conference |
| slidenotes | latex3 | A class package for the easy production of a slide collection with annotations. Builds on the report style (or variants). |
| smallcap | latex3 | Support for all 4 shapes of Small caps in DC1.3 where SC becomes a family, rather than a shape (<code>\scshape</code> is replaced by <code>\scfamily</code>). Thus you can write <code>\bf\scfamily\slshape</code> to get small caps bold slanted. |
| songbook | latex3 | Package for typesetting song lyrics. |
| sparc-linux | systems1 | System binaries for Sparc running Linux. |
| sparc-solaris2.4 | systems1 | System binaries for Sparc running Solaris 2.4. |
| sparc-solaris2.5 | systems1 | System binaries for Sun Sparc running Solaris 2.5. |
| sparc-sunos4.1.3 | systems1 | System binaries for Sparc running SunOS 4.1.3. |
| sprite | graphics3 | Macros to set bitmaps with T _E X |
| ssquote | latex3 | L ^A T _E X package and font definition file to access the ‘cmssq’ fonts, i.e. Computer Modern Sans Serif Quotation Style. The L ^A T _E X package also defines a <code>chapterquotes</code> environment as an example application. |
| startex | formats3 | A T _E X format designed to help students write short reports and essays. It provides the user with a suitable set of commands for such a task. It is also more robust than plain T _E X and L ^A T _E X. |
| stmaryrd | fonts2 | St Mary Road symbols for functional programming. |
| subeqn | latex3 | Package for subequation numbering. |
| subeqnarray | latex3 | Equation array with sub numbering. |
| subfigure | latex3 | Figures divided into subfigures. |
| supertabular | latex3 | A multi-page tables package. |
| swift | latex3 | Miscellaneous macros by Matt Swift. |
| tap | plain3 | An advanced table package. |
| taylor | graphics3 | Diagram macros by Paul Taylor. |
| tbe | plain3 | Examples from Arvind Borde’s <i>T_EX by Example</i> |
| tengwar | fonts3 | Font for typesetting Tolkien Tengwar script, by Michael Urban |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|---|
| tex-ps | generic3 | Various extra support file for dvips. |
| texdraw | graphics3 | Graphical macros, using embedded PostScript. |
| texip | formats3 | Macros from <i>T_EX in Practice</i> |
| texlive | texlive1 | Basic material for T_EX Live . |
| text1 | formats3 | T _E X format from the University of Washington |
| textcomp | latex3 | Supports the Text Companion fonts which provide many text symbols (such as baht, bullet, copyright, musicalnote, onequarter, section, and yen) in the TS1 encoding. |
| textfit | latex3 | Package to support fitting of text to a given width or height by scaling the font |
| textmerg | latex3 | Merge text in T _E X and L ^A T _E X. Useful, for example, in mail merge. |
| thesis | latex3 | A class for producing a thesis based on the report class for a more European and more flexible look. Supports options like noindent, noitemization, headline, nocenter, crosshair, and chapterbib. |
| timesht | latex3 | Package for typesetting time sheets. |
| tipa | fonts3 | Fonts and macros for IPA phonetics characters. |
| tools | latex2 | Standard L ^A T _E X 2 _ε tools, for extended tabular, verbatim and theorem support |
| tracking | latex3 | Automatically adjust spaces between symbols in words or phrases to fit them into a specified length. Any chain of symbols (including spaces) in the current font may be treated. |
| treesvr | latex3 | Tree macros. |
| treetex | plain3 | Allows the automatic layout of n-ary trees with arbitrary node sizes in L ^A T _E X, using an external C program to do much of the hard work. |
| tugboat | generic2 | Macros for TUGboat articles (plain and L ^A T _E X). |
| type1cm | latex3 | A package that removes the restriction when using scalable versions of the cm fonts (Type1 Bakoma, or versions from BSR/Y&Y, or True Type versions from Kinch, PCTeX etc.) where L ^A T _E X restricts the cm fonts to discrete sizes. |
| typehtml | latex3 | Typeset HTML (i.e., World Wide Web documents) directly from L ^A T _E X. Can handle almost all of HTML2, and most of the math fragment of the draft HTML3. |
| uaclasses | latex3 | This package provides a L ^A T _E X 2 _ε document class named ‘ua-thesis’ for typesetting theses and dissertations in the official format required by the University of Arizona. Moreover, there is a fully compatible alternative document class ‘my-thesis’ for private “nice” copies of the dissertation, and the respective title pages are available as separate packages to work with “any” document class. |
| ucthesis | latex3 | A modified version of the standard L ^A T _E X REPORT style that is accepted for use with University of California PhD dissertations and Masters theses. |
| ulsy | latex3 | Extra mathematical characters |
| umlaute | latex3 | An interface to inputenc for using alternate input encodings |
| umrand | fonts3 | Package for page frames. |
| underlin | latex3 | Package for underlining. Be advised that underlining is considered bad style in typesetting. See also ulem which is a specific package for L ^A T _E X. |
| useful | doc2 | Useful documentation; various L ^A T _E X guides, FAQ, fontname docs, etc. |
| utthesis | latex3 | Produces a thesis that meets the requirements of the Graduate School of The University of Texas at Austin :-) |
| uwthesis | latex3 | University of Washington thesis |
| vdm | latex3 | Typesetting VDM schemas |
| vector | latex3 | Macros for more convenient representation of vectors in L ^A T _E X 2 _ε , both symbolically and as implicit or explicit rows/columns of elements |
| vertex | plain3 | Styles for economics working papers and journals |
| vita | latex3 | This class provides necessary macros to prepare your Curriculum Vitae or Resume. |
| vrbl | latex3 | Verbatim macros via plain T _E X |

Catalogue of Packages *continued*

| <i>Package</i> | <i>Collection</i> | <i>Description</i> |
|----------------|-------------------|--|
| vrslon | latex3 | Defines a command which produces a version number in the .dvi-file when L ^A T _E X is run. |
| wasy | fonts3 | The wasy fonts (Waldis symbol fonts) |
| wasysym | latex2 | Makes some additional characters available that come from the wasy fonts (Waldis symbol fonts). These fonts are not automatically included in NFSS2/L ^A T _E X 2 _ε since they take up important space and aren't necessary if one makes use of the packages amsfonts or amssymb. Symbols include: join, box, diamond, leadsto, sqsubset, lhd, rhd, apprle, ocircle, invneg, logof, varint, male, female, phone, clock, lightning, pointer, sun, bell, permil, smiley, various electrical symbols, shapes, music notes, circles, signs, astronomy, etc. |
| williams | latex3 | Miscellaneous macros by Peter Williams. |
| win32 | systems1 | System binaries for Windows 32. |
| wnri | fonts3 | METAFONT fonts for Old English, Indic languages in transcription, and American Indian languages. |
| wsuipa | fonts2 | Washington State University IPA phonetic fonts |
| xymtex | latex3 | Typesetting chemical structures. |
| xypic | graphics2 | Sophisticated macros and fonts, originally designed for commutative diagrams, but with general applicability. |
| yhmath | latex3 | Extended maths fonts for L ^A T _E X. |
| youngtab | latex3 | A package for typesetting Young-Tableaux mathematical symbols for the representations of groups, providing two macros, \yng(#1) and \young(#1) to generate the whole Young-Tableaux. |
| ytex | formats3 | Macro package developed at MIT. |
| zed-csp | latex3 | Typesetting Z and CSP format specifications |

◇ Sebastian Rahtz
 7 Stratfield Road
 Oxford OX2 7BG
 UK
 s.rahtz@elsevier.co.uk

◇ Michel Goossens
 CERN
 CH-211 Geneva 23
 Switzerland
 m.goossens@cern.ch