The TeX Live Guide, 3rd edition

Sebastian Rahtz
s.rahtz@elsevier.co.uk
Michel Goossens
m.goossens@cern.ch

March 1998

Contents

List of Tables

1 Introduction

This documentation describes the main features of the **TEX Live** 3 CD-ROM—a TEX/LATEX distribution for Unix, Windows32 and Amiga systems that includes TEX, LATEX 2_ε, METAFONT, MetaPost, Makeindex, and BIBTEX; and a wide-ranging set of macros, fonts and documentation conforming to the *TEX Directory Standard* (TDS)—which can be used with nearly every TEX setup.

This TEX package uses the Web2c (version 7.2) implementation of the programs, which tries to make TEXing as easy as possible, and takes full advantage of the efficient and highly customizable Kpathsea library from Karl Berry and Olaf Weber. It can be run either directly from the CD-ROM or installed on a hard disk.

Most of the runnable systems on the CD-ROM include a large set of drivers and support programs for TEX, including dvips (PostScript driver), xdvi (X Windows previewer), dvilj (HP LaserJet driver), lacheck (LATEX syntax checker), tex4ht (TEX to HTML converter), dviconcat and dviselect, dv2dt and dt2dv (`dvi` to ASCII and vice versa), and Angus Duggan's PostScript utilities.

1.1 Extensions to TEX

The **TEX Live** runnable systems contain three experimental extensions to normal TEX:

1. ε-TEX, which adds a small but powerful set of new primitives, and the TEX--XET extensions for left to right typesetting; in default mode, ε-TEX is 100% compatible with ordinary TEX. See `texmf/etex/doc/base/etex_man.tex` on the CD-ROM for details.

2. pdfTEX, which can optionally write Acrobat PDF format instead of DVI; there is no formal documentation for this yet, but the file `texmf/pdftex/plain/misc/example.tex` shows how it is used. The LATEX hyperref package has an option '`pdftex`', which turns on all the program features.

3. Ω (Omega), which works internally with 16-bit characters, using Unicode; this allows it to directly work with almost all the world's scripts simultaneously. It also supports dynamically loaded 'Ω Translation Processes' (OTPs), which allow the user to define

complex transformations to be performed on arbitrary streams of input. See `texmf/doc/omega/base/doc2.tex` for documentation.

ε-TEX is stable (version 2.0), although subsequent releases will add new functionality. pdfTEX (version 0.12h) and Ω (version 1.5) are under continual development; the versions on this CD-ROM are those current as of mid March 1998.

1.2 Other packages

The following complete packages are included on the CD-ROM:

- OzTEX for Macintosh.
- CMacTeX for Macintosh.
- Macintosh utilities (Alpha, Excalibur, etc.).
- MikTeX for Windows 95.
- emTeX for DOS and OS/2.
- The DJGPP version of the Web2c TEX system, which works under DOS and all Windows versions.
- TEX shells for Windows and DOS (Winedt, TeXtelmExtel, emTeXgi).

These are provided unchanged from CTAN, and have not been integrated in any way with the rest of the CD-ROM. To use the packages, go to the relevant directory and follow the installation instructions.

2 Structure and contents of the CD-ROM

The important CD-ROM top-level directories are listed below.

bin The TEX family programs, arranged in separate platform directories.

doc Documentation for **TEX Live**.

cstug Material for the Czech/Slovak TEX Users Group.

FAQ Frequently Asked Questions, in English, French and German.

info Documentation in GNU 'info' format for the TEX system.

man Documentation in the form of Unix man pages for the TEX system.

source The source of all programs, including the main Web2c TEX and METAFONT distributions.

support Various bits of TEX-related software which are *not* installed by default, such as MusixTEX, support programs, and a complete distribution of Ghostscript.

systems Packaged TEX systems which are separate from the main **TEX Live**. Subdirectories in here are:

amiga Extra support programs for the Amiga.

macintosh The OzTEX and CMacTeX packages ready to install, plus some other utilities.

msdos DOS TEX packages—djgppTEX, emTeX, and three TEX shells.

win32 TEX packages for Windows 95 and NT users —MikTeX, and the editor/shell WinEdt.

wingut The GUTenberg TEX distribution for Windows

texmf The main support tree of macros, fonts and documentation;

TUG Material about the TEX Users Group.

winedt A ready to run installation of WinEdt for Windows 95/NT.

There are also two installation scripts for Unix systems, `install-cd.sh` and `install-pkg.sh`; we discuss them on in section refsec:install on p. 5.

2.1 The TDS tree

The **TEX Live** `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. The collections are:

ams The American Mathematical Society macro packages and fonts.

bibtex BIBTEX styles and databases.

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

dvips Support for Rokicki's DVI-to-PostScript driver.

etex Support for ε-TEX.

fonts Font sources, metrics, PostScript and bitmap forms.

formats Eplain, RevTEX, 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 LATEX, including official tools and all LATEX 2_ε contributed packages.

metapost Support for MetaPost.

omega Support for Ω.

plain Macros for plain TEX.

systems Binaries for Unix, Amiga and Win32 platforms.

texlive Basic material for the distribution.

Each of the collections is divided into *basic* (1), *recommended* (2) and *other* (3). The appendix starting on page 41 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 LATEX, packages in `latex2` are recommended for most users, and `latex3` contains optional packages. The directory `texmf/lists` contains lists of all files in each package (used by the installation programs).

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 and Joliet 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 this with 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 shows the list of available systems and the corresponding directories.

DEC Alpha (3.2 and 4.0)	`alpha-osf3.2`	`alpha-osf4.0`
Amiga	`m68000-amigaos2.1`	
HP9000 HPUX 10.10	`hppa11-hpux10.10`	
Linux (on Intel Pentium)	`i386-linux`	
SGI IRIX (5.3 and 6.2)	`mips-irix5.3`	`mips-irix6.2`
IBM RS 6000 AIX (3.2.5 and 4.1.1)	`rs6000-aix3.2.5`	`rs6000-aix4.1.1`
Sun Sparc Sunos 4.1.3	`sparc-sunos4.1.3`	
Sun Sparc Solaris (2.5.1 and 2.6)	`sparc-solaris2.5.1`	`sparc-solaris2.6`
Windows 95 or NT (Intel machines)	`win32`	

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/TeX.local`, but you can override this by setting the `TEXMFLOCAL` environment variable.

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

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

Then they should include the directory containing the binaries for the given architecture into the search path by updating the `PATH` variable.

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

For convenience, these statements can also be entered into the `.profile` script.

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 script 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(a)), 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 the *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 100 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 `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 1(b)). 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 1(c)).

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. If you installed a system, an initialization sequence is now 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, you can move the binaries up one level, e.g. from `/usr/local/bin/alpha-osf3.2` to `/usr/local/bin`; if you do this, however, you must edit `texmf/web2c/texmf.cnf` (see Appendix A) and change line 50:

```
TEXMFMAIN = $SELFAUTOPARENT
```

to

```
TEXMFMAIN = $SELFAUTODIR
```

If you move the binaries to another directory tree entirely, you need to edit `TEXMFMAIN` to specify the support tree explicitly, and set `TEXMFCNF` in your environment to `$TEXMFMAIN/texmf/web2c`.

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

```
==================> TeX Live installation procedure <=================

===> Note: Letters/digits in <angle brackets> indicate menu items <===
===>       for commands or configurable options                   <===

    Proposed platform: Intel x86 with Linux (ELF)
    <P> over-ride system detection and choose platform

    <C> collections:    23 out of 33, disk space required: 176108 kB
    <S> systems:         1 out of 13, disk space required:   6359 kB
                                total disk space required: 182467 kB
    <D> directories:
          TEXMFMAIN  = /usr/TeX
            (where the main TeX system will live)
          TEXMFLOCAL = /var/TeX
            (where you will install your own styles and site changes)

    <O> options:
          [ ] alternate directory for automatically generated fonts
                         ()
          [ ] create symlinks in standard directories

    Other commands:
          <I> start installation,  <H> help,  <Q> quit
```

(a) Main control screen

```
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:
```


(b) Selecting collections

Figure 1: Examples of screens used by the installation script

```
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:
```

(c) Customizing a collection

Figure 1: Examples of screens used by the installation script (contd.)

```
>> 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 `mktexlsr` 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 it, 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 LaTeX package natbib:

  >> sh install-pkg.sh --package=natbib

- Install the LaTeX package alg with no source files and no documentation:

  >> sh install-pkg.sh --package=alg --nosrc --nodoc

- Install all the packages available in the *other* Plain TeX collection:

  >> sh install-pkg.sh --collection=plain3

- Place all files which are needed for PSTricks in a tar file in /tmp:

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

3.4 The texconfig program

After the installation program has copied all files to their final locations, you can use 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, such as changes of installed printers, or rebuilding the file database. Both modes have help text to guide you through the facilities.

4 Installation and use under Windows

This section only applies to systems running Windows 9x or NT. If you run Windows 3.1, you will have to install emTeX, DJGPP TeX, or wingut (in the top level systems directory) by hand.

It is also necessary to have your Windows set up so that it uses the Microsoft Joliet extensions for reading CD-ROMs; simply look at the CD-ROM in Explorer and see whether it shows long, mixed-case, file names. If it does not, you cannot use the ready-to-run system on the CD-ROM.

This Win32 TeX systems includes a new dvi previewer, Windvi, which is similar in usage to the established Unix xdvi. The documentation can be found in texmf/doc/windvi/windvi.html.

4.1 Running from the CD-ROM

You can run all the TeX programs directly off the CD-ROM, and have access to all the macros and fonts immediately, at the price of a slower performance than if you install on the hard disk. To do this, you must add the `bin/win32` directory of the CD-ROM to your PATH, using the Windows configuration software. Now you can run the programs at a command prompt, or use the shareware WinEdt editor, which runs the programs from convenient menus. Copy the entire `winedt` directory from the CD-ROM to your hard disk, and run `winedt.exe` from that copy.

Please respect the shareware status of WinEdt and register your copy if you intend to carry on using it.

4.2 Installing to your hard disk

Installation is started by running the program `install.exe` in the CD-ROM top level, which works by accessing lists of collections and packages from the CD-ROM. It will allow you to select the level at which each collection is installed (see section 2.1 for a description of 'collections' and 'packages', and permits you to omit the documentation and/or source segments of the packages if your disk space is limited. You will be prompted for directories in which to install the main distribution, and your local configuration. In addition, you will be able to install a shareware TeX editor, WinEdt, and the PostScript viewer Ghostscript.

Please respect the shareware status of WinEdt and register your copy if you intend to carry on using it.

Please be aware that the choice of cluster size on DOS disk partitions can radically affect the size of your TeX installation. The support tree has hundreds of small files, and it is not unusual for a complete installation to take up to 4 times the amount of space used on the CD-ROM.

When installation is complete, you will have to restart Windows, and then you can either run the TeX programs from a command prompt, or via WinEdt's menus (if you opted to install it).

5 Building on a new Unix platform

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

You should first install the support tree from the **TeX Live** CD-ROM (do a basic install, with no system binaries chosen).

5.0.1 Prerequisites

You will need about 100 megabytes of disk space to compile all of TeX and its support programs. You'll also need an ANSI C compiler, a make utility, a lexical scanner, and a parser generator. The GNU utilities (gcc, GNU make, flex, bison) are the most widely tested on different platforms. gcc-2.7.* flex-2.4.7 and GNU make-3.72.1 or newer should work well. 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.

5.0.2 Configuration

First, copy the directory `source` to your disk and change directory to where you placed it. Decide where the 'root' of the installation will be, e.g. `/usr/local` or `/usr/local/TeX`. Obviously you should use the same location that you specified when you installed the support tree.

Now, start the build process by running configure with a command-line like

```
>> ./configure -prefix=/usr/local/TeX
```

The 'prefix' directory is the one where you installed the support tree; the directory layout that will be used is as follows (where $TEXDIR stands for the directory you chose):

`$TEXDIR/man`	UNIX manual pages
`$TEXDIR/share/texmf`	main tree with fonts, macros, etc
`$TEXDIR/info`	GNU style info manuals
`$TEXDIR/bin/$PLATFORM`	binaries

You can omit the use of '`share/`' part for the `texmf` directory if you want, as `$TEXDIR/share/texmf` and `$TEXDIR/texmf` are auto-detected by configure. If you choose something different, you have to specify that directory with the `--datadir` option of configure.

If you want to leave out the `$PLATFORM` directory level (i.e. put the binaries directly into `$TEXDIR/bin`), specify the `--without-multiplatform` option for configure.

Have a look at the output of `./configure --help` for more options you can use (such as omitting optional packages such as Ω or ε-TEX).

5.0.3 Running make

Make sure the shell variable `noclobber` is not set, and then type

```
>> make world
```

and relax. . . .

It could also be useful to log all the output, e.g. by typing

```
>> sh -c "make world >world.log 2>&1" &
```

Before you think that everything is ok, please check the log file for errors (GNU make always uses the string "`Error:`" whenever a command returns an error code) and check if all binaries are built:

```
>> cd /usr/local/TeX/bin/i586-pc-linux-gnu
>> ls | wc
```

The result should be 179. `make world` is equivalent to `make all install strip`

If you need special privileges for `make install`, you can run two make jobs in separate runs:

```
>> make all
>> su
>> make install strip
```

5.0.4 Final configuration steps

Set up your `PATH` to include the directory containing the just-installed binaries (e.g. `/usr/local/TeX/bin/mips-sgi-irix6.3`); similarly, `MANPATH` and `INFOPATH` to include the relevant newly installed subdirectories, i.e. `$TEXDIR/man` and `$TEXDIR/info`.

The program texconfig allows you to set the defaults for hyphenation, paper size, print command, METAFONT mode, etc. You can run this command interactively and see what options it offers, or type

```
>> texconfig help
```

For example, if you are not using A4 format paper, you can make 'lettersize' the default using:

```
>> texconfig dvips paper letter
>> texconfig xdvi paper us
```

6 A user's guide to the Web2c system

Web2c contains a set of TeX-related programs, i.e., TeX itself, METAFONT, MetaPost, BibTeX, etc. The original implementation was by Tomas Rokicki who, in 1987, developed a first TeX-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, and in 1997 he handed the baton to Olaf Weber. The latest result is Web2c Version 7.2, which was released in March 1998, and forms the basis of the present **TeX Live** CD-ROM.

The Web2c 7.2 system runs on Unix, Windows 3.1, 9x/NT, DOS, Amiga and other operating systems. It uses Knuth's original sources for TeX 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 core TeX family 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.

pktogf 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 7.2 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.

6.1 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 page 18) 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 sought.

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 it transforms 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.

6.1.1 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's `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 page 23).

6.1.2 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 `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 appendix A, starting on page 32, 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 has the form:

  `variable``[.`*`progname`*`] [=]` *`value`*

  where the "`=`" and surrounding whitespace are optional.
- The "*`variable`*" name may contain any character other than whitespace, "`=`", or "`.`", but sticking to "`A-Za-z_`" is safest.
- If "`.`*`progname`*" is present, the definition only applies if the program that is running is named *`progname`* or *`progname`*`.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. A "`;`" in "*`value`*" is translated to "`:`" if running under Unix; this is useful to be able to have a single `texmf.cnf` for Unix, MSDOS and Windows systems.
- All definitions are read before anything is expanded, so variables can be referenced before they are defined.

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

```
TEXMF              = {$TEXMFLOCAL;!!$TEXMFMAIN}
TEXINPUTS.latex    = .;$TEXMF/tex/{latex;generic;}//
TEXINPUTS.fontinst = .;$TEXMF/tex//;$TEXMF/fonts/afm//
% e-TeX related files
TEXINPUTS.elatex   = .;$TEXMF/{etex;tex}/{latex;generic;}//
TEXINPUTS.etex     = .;$TEXMF/{etex;tex}/{eplain;plain;generic;}//
```

6.1.3 Path expansion

Kpathsea recognizes certain special characters and constructions in search paths, similar to those available in Unix shells. As a general example, the 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.

6.1.4 Default expansion

If the highest-priority search path (see "Path sources" on page 15) 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 "`:`".

6.1.5 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 (line 52) the following definition:

```
TEXMF = {$TEXMFLOCAL,!!$TEXMFMAIN}
```

Using this you can then write something like

```
TEXINPUTS = .;$TEXMF/tex//
```

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" (on a CD-ROM, for instance) and the other being continuously updated with new versions as they become available. By using the `$TEXMF` variable in all definitions, one is sure to always search the up-to-date tree first.

6.1.6 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.

6.1.7 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 (can occur anywhere in a path, except at its begining).

`%` Start of comment.

`\` Continuation character (allows multi-line entries).

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

6.2 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 DOS-like "8.3" filename conventions in source files.

6.2.1 The 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 hierarchy in your installation that you wish to be searched (`$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 mktexlsr script included with the distribution. It is invoked by the various "mktex"... 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.

6.2.2 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 "mktex"... scripts).

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

The options specified in "*option*" 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. For formats which do not have an associated unambiguous suffix, such as MetaPost support files and dvips configuration files, you have to specify the name as found in the first column of Table 1, which lists currently recognized names, a description, associated environment variables[1], and possible file extensions.

Table 1: Kpathsea file types

Name	*Description*	*Variables*	*Suffixes*
afm	Adobe font metrics	AFMFONTS	.afm
base	Metafont memory dump	MFBASES, TEXMFINI	.base
bib	BibTeX bibliography source	BIBINPUTS, TEXBIB	.bib

[1] You can find definitions for these environment variables in the file texmf.cnf (page 32)

Kpathsea file types *continued*

Name	*Description*	*Variables*	*Suffixes*
bst	BibTeX style files	BSTINPUTS	.bst
cnf	Runtime configuration files	TEXMFCNF	.cnf
dvips config	dvips configuration files, e.g., config.ps and psfonts.map	TEXCONFIG	.map
fmt	TeX memory dump	TEXFORMATS, TEXMFINI	.fmt, .efmt, .efm
gf	generic font bitmap	FONTS, GFFONTS, GLYPHFONTS, TEXFONTS	.gf
graphic/figure	Encapsulated PostScript figures	TEXPICTS, TEXINPUTS	.eps, .epsi
ist	makeindex style files	TEXINDEXSTYLE, INDEXSTYLE	.ist
ls-R	Filename databases	TEXMFDBS	
map	Fontmaps	TEXFONTMAPS	.map
mem	MetaPost memory dump	MPMEMS, TEXMFINI	.mem
mf	Metafont source	MFINPUTS	.mf
mfpool	Metafont program strings	MFPOOL, TEXMFINI	.pool
mft	MFT style file	MFTINPUTS	.mft
mp	MetaPost source	MPINPUTS	.mp
mppool	MetaPost program strings	MPPOOL, TEXMFINI	.pool
MetaPost support	MetaPost support files, used by DMP	MPSUPPORT	
ocp	Ω compiled process files	OCPINPUTS	.ocp
ofm	Ω font metrics	OFMFONTS, TEXFONTS	.ofm, .tfm
opl	Ω property lists	OPLFONTS, TEXFONTS	.opl
otp	Ω translation process files	OTPINPUTS	.otp
ovf	Ω virtual fonts	OVFFONTS, TEXFONTS	.ovf
ovp	Ω virtual property lists	OVPFONTS, TEXFONTS	.ovp
pk	packed bitmap fonts	*program*FONTS (*program* being XDVI, etc.), PKFONTS, TEXPKS, GLYPHFONTS, TEXFONTS	.pk
PostScript header	downloadable PostScript	TEXPSHEADERS, PSHEADERS	.pro, .enc
tex	TeX source	TEXINPUTS	.tex, .cls, .sty, .clo, .def
TeX system documentation	Documentation files for the TeX system	TEXDOCS	
TeX system sources	Source files for the TeX system	TEXSOURCES	
texpool	TeX program strings	TEXPOOL, TEXMFINI	.pool
tfm	TeX font metrics	TFMFONTS, TEXFONTS	.tfm
Troff fonts	Troff fonts, used by DMP	TRFONTS	
truetype fonts	TrueType outline fonts	TTFONTS	.ttf, .ttc
type1 fonts	Type 1 PostScript outline fonts	T1FONTS, T1INPUTS, TEXPSHEADERS, DVIPSHEADERS	.pfa, .pfb

Kpathsea file types *continued*

Name	*Description*	*Variables*	*Suffixes*
`type42 fonts`	Type 42 PostScript outline fonts	`T42FONTS`	
`vf`	virtual fonts	`VFFONTS, TEXFONTS`	`.vf`
`web2c files`	Web2c support files	`WEB2C`	
`other text files`	text files used by 'foo'	`FOOINPUTS`	
`other binary files`	binary files used by 'foo'	`FOOINPUTS`	

The last two entries in Table 1 are special cases, where the paths and environment variables depend on the name of the program: the variable name is constructed by converting the program name to upper case, and then appending `INPUTS`.

The 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.

`--mode=`*`string`*
: Set the mode name to "*`string`*"; this 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.

`--progname=`*`name`*
: Set the program name to "*`name`*". This can affect the search paths via the "`.`*`prognam`*" 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 a name can be used, just as with "`--format`" option.

`--debug=`*`num`*
: sets the debugging options to "*`num`*".

6.2.3 Examples of use

Let us now have a look at Kpathsea in action.

```
>> kpsewhich  article.cls
   /usr/local/texmf/tex/latex/base/article.cls
```

We are looking for the file `article.cls`. Since the "`.cls`" suffix is unambiguous we do not need to specify that we want to look for a file of type "tex" (TEX source file directories). We find it in the subdirectory `tex/latex/base` below the "`TEXMF`" root directory. Similarly, all of the following are found without problems thanks to their unambiguous suffix.

```
>> kpsewhich array.sty
   /usr/local/texmf/tex/latex/tools/array.sty
>> kpsewhich latin1.def
   /usr/local/texmf/tex/latex/base/latin1.def
>> kpsewhich size10.clo
   /usr/local/texmf/tex/latex/base/size10.clo
>> kpsewhich small2e.tex
   /usr/local/texmf/tex/latex/base/small2e.tex
>> kpsewhich tugboat.bib
   /usr/local/texmf/bibtex/bib/beebe/tugboat.bib
```

The latter is a BIBTEX bibliography database for *TUGBoat* articles.

```
>> kpsewhich cmr10.pk
```

Font bitmap glyph files of type `.pk` are used by display programs like dvips and xdvi. Nothing is returned in this case since there are no pre-generated Computer Modern "`.pk`" files on our system (since we use the Type1 versions on the CD-ROM).

```
>> kpsewhich ecrm1000.pk
   /usr/local/texmf/fonts/pk/ljfour/jknappen/ec/ecrm1000.600pk
```

For the extended Computer Modern files we had to generate "`.pk`" files, and since the default METAFONT mode on our installation is `ljfour` with a base resolution of 600 dpi (dots per inch), this instantiation is returned.

```
>> kpsewhich -dpi=300 ecrm1000.pk
```

In this case, when specifying that we are interested in a resolution of 300dpi (`-dpi=300`) we see that no such font is 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 mktexpk.

Next we turn our attention to dvips's header and configuration files. We first look at one of the commonly used files, the general prolog `tex.pro` for TEX support, before turning our attention to the generic configuration file (`config.ps`) and the PostScript font map `psfonts.map`. As the "`.ps`" suffix is ambiguous we have to specify explicitly which type we are considering ("`dvips config`") for the file `config.ps`.

```
>> kpsewhich tex.pro
   /usr/local/texmf/dvips/base/tex.pro
>> kpsewhich --format="dvips config" config.ps
   /usr/local/texmf/config/config.ps
>> kpsewhich psfonts.map
   /usr/local/texmf/dvips/base/psfonts.map
```

We now take a closer look 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="dvips config"  config.utm
   /usr/local/texmf/dvips/psnfss/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 --format="dvips config" utm.map
   /usr/local/texmf/dvips/psnfss/utm.map
```

This map file defines the file names of the Type1 PostScript fonts in the URW collection. its 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 us, for instance, take the Times Regular instance `utmr8a.pfb` and find its position in the `texmf` directory tree by using a search for Type1 font files:

```
>> kpsewhich utmr8a.pfb
   /usr/local/texmf/fonts/type1/urw/utm/utmr8a.pfb
```

It should be evident from these few examples how you 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.

6.2.4 Debugging actions

Sometimes it is necessary to 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, by setting a combination of debug switches, one can follow in detail where files are being 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, one 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 uses the font `cmr10`, so let us look how dvips prepares the PostScript file (we want to use the Type1 version of the Computer Modern fonts, hence the option `-Pcms`).

```
>> dvips -d4100 hello-world -Pcms -o
```

In this case we have combined dvips's debug class 4 (font paths) with Kpathsea's path element expansion (see dvips Reference Manual, `texmf/doc/html/dvips/dvips_toc.html`). We get something like the following (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/texmf/web2c:/usr/local:
       /usr/local/texmf/web2c:/.:/./teTeX/TeX/texmf/web2c:).
kdebug:start search(file=ls-R, must_exist=1, find_all=1,
  path=~/tex:/usr/local/texmf).
kdebug:search(ls-R) =>/usr/local/texmf/ls-R
kdebug:start search(file=aliases, must_exist=1, find_all=1,
  path=~/tex:/usr/local/texmf).
kdebug:search(aliases) => /usr/local/texmf/aliases
kdebug:start search(file=config.ps, must_exist=0, find_all=0,
  path=.:~/tex:!!/usr/local/texmf/dvips//).
kdebug:search(config.ps) => /usr/local/texmf/dvips/config/config.ps
kdebug:start search(file=/root/.dvipsrc, must_exist=0, find_all=0,
  path=.:~/tex:!!/usr/local/texmf/dvips//).
search(file=/home/goossens/.dvipsrc, must_exist=1, find_all=0,
  path=.:~/tex/dvips//:!!/usr/local/texmf/dvips//).
kdebug:search($HOME/.dvipsrc) =>
kdebug:start search(file=config.cms, must_exist=0, find_all=0,
  path=.:~/tex/dvips//:!!/usr/local/texmf/dvips//).
kdebug:search(config.cms)
=>/usr/local/texmf/dvips/cms/config.cms
```

dvips starts by locating its working files. First, texmf.cnf is found, which gives the definitions of the search paths for the other files, then the file database ls-R (to optimize file searching) and the file aliases, which makes it possible to declare several names (e.g., a short DOS-like "8.3" and a more natural longer version) for the same file. Then dvips goes on to find the generic configuration file config.ps before looking for the customization file .dvipsrc (which, in this case is *not found*). Finally, dvips locates the config file for the Computer Modern PostScript fonts config.cms (this was initiated with the -Pcms option on the dvips command). This file contains the list of the "map" files which define the relation between the TEX, PostScript and file system names of the fonts.

```
>> more /usr/local/texmf/dvips/cms/config.cms
   p +ams.map
   p +cms.map
   p +cmbkm.map
   p +amsbkm.map
```

dvips thus goes on to find all these files, plus the generic map file psfonts.map, which is always loaded (it contains declarations for commonly used PostScript fonts; see the last part of Section 6.2.3 for more details about PostScript map file handling).

At this point dvips identifies itself to the user:

```
This is dvips 5.76a Copyright 1997 Radical Eye Software (www.radicaleye.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=.:~/tex/dvips//:!!/usr/local/texmf/dvips//:
       ~/tex/fonts/type1//:!!/usr/local/texmf/fonts/type1//).
kdebug:search(texc.pro) => /usr/local/texmf/dvips/base/texc.pro
```

After having found the file in question, 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 1998.02.26:1204' -> 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) are referenced, and finally the Type1 instance cmr10.pfb of the font is located and included in the output file (see last line).

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

6.3 Runtime options

Another of the nice features of Web2c 7.2 is its possibility to control a number of memory parameters (in particular, array sizes) via the runtime file `texmf.cnf` read by Kpathsea. The listing of `texmf.cnf` is shown in Appendix A, starting on page 32; the settings of all parameters can be found in Part 3 of that file. The more important control variables are (line numbers refer to the file `texmf.cnf`):

`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 line 327 for the generic value and line 329 for the "huge" one instantiated by `hugetex`, etc.).

`extra_mem_bot` Extra space for "large" TeX data structures: boxes, glue, breakpoints, etc. Especially useful if you use PICTeX (line 300).

`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 (lines 310–314).

`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 lines 319 to 321 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.

7 Other TeX systems 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 six complete TeX systems: two for Macintosh (OzTeX and CMacTeX), one for Windows 95 (MikTeX), one for DOS and OS/2 (emTeX), and two for DOS or Windows (djgpp or wingut),

7.1 DJGPP TeX

This is a DJGPP port by Eli Zaretskii (eliz@is.elta.co.il) of TeX, Web2c 7.2, DVI drivers, and related utilities. The programs are the same versions as, and behave in an identical way to, the other Web2c 7.2-based systems, for Unix, Amiga and Win32, on this CD-ROM. In the next release of **TEX Live**, we hope to have them runnable directly from the CD-ROM.

The package is supplied as a compressed .zip archive, which is intended to be unpacked to one of your disk drives. This should minimize potential problems due to how long file names are stored on the CD-ROM and supported by various CD drivers on different operating systems.

7.1.1 Installation

Create a directory for the TEX packages and change your current working directory to be it. For example:

```
mkdir c:\texlive
cd c:\texlive
c:
```

In the following description, we assume that the root of your TEX installation is `c:\texlive`. However, there's nothing magic in that name; you can use any other name you wish. (In particular, those who have other DJGPP ports installed would probably want to use the root of their DJGPP installation tree as the place to install TEX.)

Now insert the **TEX Live** CD-ROM into your drive, wait until the LED on the drive goes off, unzip the package. For your convenience, we provide a free program for that purpose: InfoZip's UnZip; it is in the same directory where the compressed archive is held. We recommend using that unzip.exe since it will automatically support long file names on Windows 9X, where the compressed programs support them as well.

Assuming your CD-ROM drive letter is F:, type the following from the DOS prompt (if you are doing this on Windows, open a DOS box and type from there):

```
f:\systems\msdos\djgpp\unzip f:\systems\msdos\djgpp\djgpptex.zip
```

If you want to use any other unzip program, be sure to invoke it with an option that causes it to preserve directory hierarchy as recorded in the zip file (e.g., for PKUNZIP, use the `-d` switch). Also, be sure to use a program that supports long file names if you intend to use TEX programs on Windows 9X.

Finally, add the directory `c:\texlive\bin` to your `PATH`, and define variables for reading documentation:

```
set INFOPATH=c:/texlive/info;%INFOPATH%
set MANPATH=c:/texlive/man;%MANPATH%
```

(the forward slashes are important in these variables!)

That's all! You are now ready to run the programs. Some additional details can be found in `systems/msdos/djgpp/README.djgpp`

7.2 OzTEX[2]

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`)

[2]This section was written by Andrew Trevorrow.

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 PICT/PNTG/EPSF 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 LaTEX's `color`, `graphics/x` and `hyperref` packages. It recognizes all dvips-specific `\special`s and those it cannot handle (like rotation) are silently ignored.

OzTEX includes all the most popular formats and macro packages: Plain TEX, LaTEX, AMS-TEX, AMS-LaTEX and REVTEX 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 TEX how much memory to allocate for various arrays, specifying which TFMs 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.

7.2.1 Additional programs

The usual assortment of TEX-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; BibTEX by Vince Darley; MakeIndex by Rick Zaccone; Excalibur, a TEX/LaTEX spelling checker, by Rick Zaccone and Robert Gottshall; and AlphaLite, a TEX/LaTEX-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`).

7.3 CMacTeX[3]

CMacTeX is an implementation of TEX for the Macintosh by Thomas Kiffe (tom@tkiffe.com). It includes the three main parts of any TEX installation—TEX, METAFONT and dvips. It also

[3]This section is taken from the CMacTeX documentation.

includes two DVI previewers, a utility for printing DVI files on a non PostScript printer, a PostScript previewer and numerous utilities for manipulating TEX 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 `systems/macintosh/cmactex/ReadMeFirst`

7.4 MiKTeX[4]

MiKTeX 1.10 is an implementation by Christian Schenk (cschenk@berlin.snafu.de) of TEX- and METAFONT-related utilities for Windows NT and Windows 95. The MiKTeX distribution includes TEX; LATEX 2ε (December '97) including standard packages; METAFONT; MetaPost; dvips MakeIndex; BIBTEX; YAP (Yet Another Previewer); TeXware (dvitype etc.); METAFONTware (gftopk, etc.); psutils (psselect, pstops etc.); and DVIcopy.

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

7.5 emTeX

The emTeX distribution for DOS and OS/2 is written by Eberhard Mattes (mattes@azu.informatik.uni-stuttgart.de). It includes the TEX typesetter, the METAFONT font generation program, printer drivers, screen previewers, and tools like BIBTEX and MakeIndex. It also includes the macro packages LATEX 2.09 and LATEX 2ε. Fonts are included as pixel files and METAFONT source files.

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

8 History and acknowledgements

This CD-ROM distribution is a joint effort by the TEX Users Group, the UK TEX Users Group, the French TEX Users (GUTenberg), and the German TEX Users (DANTE e.V.), with the support of the Czech/Slovak, Dutch, Indian and Polish user groups. Discussion began in late 1993 when the Dutch TEX Users Group was starting work on its 4AllTEX CD-ROM for MS-DOS 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 4AllTEX CD-ROM, but also the TUG Technical Council working group on a *TEX Directory Structure*, which specified how to create consistent and manageable collections of TEX 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 showed 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

[4]This section is drawn from the documentation.

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. The 3rd edition of the CD-ROM was based on a major revision of Web2c, 7.2, by Olaf Weber; at the same time, a new revision of teTeX was being made, and **TeX Live** shares almost all of its features.

We are particularly grateful to:

- Karl Berry, who gave advice, encouragement, and (of course) provided the original Web2c distribution;
- Mimi Burbank, who arranged access at the Florida State University Supercomputer Research Institute to a slew of different computers to compile TeX on, and acted as an essential guinea-pig whenever asked;
- Kaja Christiansen, who provided essential feedback and documentation assistance;
- Thomas Esser, without whose marvellous teTeX package this CD-ROM would certainly not exist, and whose continual help makes it a better product;
- Robin Fairbairns, who edited this Guide for *Baskerville* and *TUGboat*;
- Eitan Gurari, whose TeX4ht was used to create the HTML version of this documentation, and who worked tirelessly to improve it at short notice;
- Thorsten Schmidt, for the Windows installation program, at very short notice;
- Olaf Weber, for his patient assembly and maintenance of Web2c 7.2;
- Graham Williams, on whose work the catalogue of packages depends.

Libor Skarvada, Staszek Wawrykiewicz, Erik Frambach, and Ulrik Vieth kindly translated documentation into their respective languages, checked other documentation, and provided very welcome feedback.

And special thanks to Fabrice Popineau (Win32), Eli Zaretskii (DJGPP), and Andreas Scherer (Amiga), who ported and compiled entire Web2c-based TeX systems, and worked their socks off to get versions ready for this CD-ROM.

9 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
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`.

A The texmf.cnf file

```
% Public domain.
%
% What follows is a super-summary of what this .cnf file can
% contain. Please read the Kpathsea manual for more information.
%
% texmf.cnf is generated from texmf.cnf.in, by replacing @var@ with the
% value of the Make variable `var', via a sed file texmf.sed, generated
% (once) by kpathsea/Makefile (itself generated from kpathsea/Makefile.in
% by configure).
%
% Any identifier (sticking to A-Za-z_ for names is safest) can be assigned.
% The `=' (and surrounding spaces) is optional.
% No % or @ in texmf.cnf.in, for the sake of autogeneration.
% (However, %'s and @'s can be edited into texmf.cnf or put in envvar values.)
% $foo (or ${foo}) in a value expands to the envvar or cnf value of foo.
%
% Earlier entries (in the same or another file) override later ones, and
% an environment variable foo overrides any texmf.cnf definition of foo.
%
% All definitions are read before anything is expanded, so you can use
% variables before they are defined.
%
% If a variable assignment is qualified with `.PROGRAM', it is ignored
% unless the current executable (last filename component of argv[0]) is
% named PROGRAM.  This foo.PROGRAM construct is not recognized on the
% right-hand side. For environment variables, use FOO_PROGRAM.
%
% Which file formats use which paths for searches is described in the
% various programs' and the kpathsea documentation.
%
% // means to search subdirectories (recursively).
% A leading !! means to look only in the ls-R db, never on the disk.
% A leading/trailing/doubled ; in the paths will be expanded into the
%   compile-time default. Probably not what you want.

%  Part 1; Search paths and directories.

% You may wish to use one of the $SELFAUTO... variables here so TeX will
% find where to look dynamically.  See the manual and the definition
% below of TEXMFCNF.
%
% User texmf trees can be catered for like this...
% HOMETEXMF = $HOME/texmf

% Now, list all the texmf trees. If you have multiple trees,
% use shell brace notation, like this:
% TEXMF = {$HOMETEXMF;!!$TEXMFLOCAL;!!$TEXMFMAIN}

```

```
TEXMFMAIN = $SELFAUTOPARENT/texmf
TEXMFLOCAL=/usr/TeX.local
TEXMF = {$TEXMFLOCAL;!!$TEXMFMAIN}

% The system trees.  These are the trees that are shared by all the users.
SYSTEXMF = $TEXMF

% Where generated fonts may be written.  This tree is used when the sources
% were found in a system tree and either that tree wasn't writable, or the
% varfonts feature was enabled in MT_FEATURES in mktex.cnf.
VARTEXFONTS = /var/tmp/fonts

% Where to look for ls-R files.  There need not be an ls-R in the
% directories in this path, but if there is one, Kpathsea will use it.
TEXMFDBS = $TEXMF;$VARTEXFONTS

% It may be convenient to define TEXMF like this:
%   TEXMF = {$HOMETEXMF:!!$TEXMFLOCAL:!!$TEXMFMAIN:$HOME}
% which allows users to set up entire texmf trees, and tells TeX to
% look in places like ~/tex and ~/bibtex.  If you do this, define TEXMFDBS
% like this:
%   TEXMFDBS = $HOMETEXMF:$TEXMFLOCAL:$TEXMFMAIN:$VARTEXFONTS
% or mktexlsr will generate an ls-R file for $HOME when called, which is
% rarely desirable.  If you do this you'll want to define SYSTEXMF like
% this:
%   SYSTEXMF = $TEXMFLOCAL:$TEXMFMAIN
% so that fonts from a user's tree won't escape into the global trees.
%
% On some systems, there will be a third system tree which contains all
% the font files that may be created as well as the formats.  For
% example
%   VARTEXMF = /var/lib/texmf
% is used on many Linux systems.  In this case, set VARTEXFONTS like this
%   VARTEXFONTS = $VARTEXMF/fonts
% and do not mention it in TEXMFDBS (but _do_ mention VARTEXMF).

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Usually you will not need to edit any of the other variables in part 1. %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% WEB2C is for Web2C specific files.  The current directory may not be
% a good place to look for them.
WEB2C = $TEXMF/web2c

% TEXINPUTS is for TeX input files -- i.e., anything to be found by \input
% or \openin, including .sty, .eps, etc.

% LaTeX 2e specific macros are stored in latex.
% latex209 is not supported, at the request of the authors of LaTeX
TEXINPUTS.latex = .;$TEXMF/tex/{latex;generic;}//
```

```

% Fontinst needs to read afm files.
TEXINPUTS.fontinst = .;$TEXMF/tex//;$TEXMF/fonts/afm//

% plain based
TEXINPUTS.texinfo = .;$TEXMF/tex/{texinfo;plain;generic;}//
TEXINPUTS.amstex = .;$TEXMF/tex/{amstex;plain;generic;}//

% ConTeXt
TEXINPUTS.context = .;$TEXMF/tex/{context;plain;generic;}//

% Omega
TEXINPUTS.omega = .;$TEXMF/{omega;tex}/{plain;generic;}/
TEXINPUTS.lambda = .;$TEXMF/{omega;tex}/{lambda;latex;generic;}//

% MLTeX.
TEXINPUTS.mltex = .;$TEXMF/{mltex;tex}/{plain;generic;}//
TEXINPUTS.mllatex = .;$TEXMF/{mltex;tex}/{latex;generic;}//

% e-TeX.
TEXINPUTS.elatex   = .;$TEXMF/{etex;tex}/{latex;generic;}//
TEXINPUTS.etex     = .;$TEXMF/{etex;tex}/{eplain;plain;generic;}//

% pdftex.
TEXINPUTS.pdftexinfo = .;$TEXMF/{pdftex;tex}/{texinfo;generic;plain;}//
TEXINPUTS.pdftex   = .;$TEXMF/{pdftex;tex}/{plain;generic;}//
TEXINPUTS.pdflatex = .;$TEXMF/{pdftex;tex}/{latex;generic;}//

% Fontinst needs to read afm files.
TEXINPUTS.fontinst = .;$TEXMF/tex//;$TEXMF/fonts/afm//

% Plain. Have the command tex check all directories as a last
% resort, we may have plain-compatible stuff anywhere.
TEXINPUTS.tex = .;$TEXMF/tex/{plain;generic;}//

% INITEX. May as well make this separate so it can search on disk;
% initex is seldom run, and might be used directly after files have been
% added, when ls-R may not up be to date.
TEXINPUTS.initex = .;$TEXMFMAIN/tex//;$TEXMFLOCAL/tex//

% Earlier entries override later ones, so put this last.
TEXINPUTS = .;$TEXMF/tex//

% Dump files (fmt/base/mem) for vir{tex,mf,mp} to read (see
% web2c/INSTALL), and string pools (.pool) for ini{tex,mf,mp}.  It is
% silly that we have six paths and directories here (they all resolve to
% a single place by default), but historically ...
TEXFORMATS = .;$TEXMF/web2c
MFBASES = .;$TEXMF/web2c
MPMEMS = .;$TEXMF/web2c
```

```
TEXPOOL = .;$TEXMF/web2c
MFPOOL = .;$TEXMF/web2c
MPPOOL = .;$TEXMF/web2c

% Metafont, MetaPost inputs.
MFINPUTS = .;$TEXMF/metafont//;{$TEXMF/fonts;$VARTEXFONTS}/source//
MPINPUTS = .;$TEXMF/metapost//

% Device-independent font metric files.
VFFONTS = .;$TEXMF/fonts/vf//
TFMFONTS = .;$TEXMF/fonts/tfm//;$VARTEXFONTS/tfm//

% The $MAKETEX_MODE below means the drivers will not use a cx font when
% the mode is ricoh.  If no mode is explicitly specified, kpse_prog_init
% sets MAKETEX_MODE to /, so all subdirectories are searched.  See the manual.
PKFONTS = .;{$TEXMF/fonts;$VARTEXFONTS}/pk/{$MAKETEX_MODE;modeless}//

% Similarly for the GF format, which only remains in existence because
% Metafont outputs it (and MF isn't going to change).
GFFONTS = .;$TEXMF/fonts/gf/$MAKETEX_MODE//

% A backup for PKFONTS and GFFONTS. Not used for anything.
GLYPHFONTS = .;$TEXMF/fonts

% For texfonts.map and included map files used by MakeTeXPK.
% See ftp://ftp.tug.org/tex/fontname.tar.gz.
TEXFONTMAPS = .;$TEXMF/fontname

% BibTeX bibliographies and style files.
BIBINPUTS = .;$TEXMF/bibtex/bib//
BSTINPUTS = .;$TEXMF/bibtex/bst//

% MFT style files.
MFTINPUTS = .;$TEXMF/mft//

% PostScript headers, prologues (.pro), encodings (.enc) and fonts.
TEXPSHEADERS = .;$TEXMF/dvips//;$TEXMF/pdftex//;$TEXMF/fonts/type1//

% PostScript Type 1 outline fonts.
T1FONTS = .;$TEXMF/fonts/type1//;$TEXMF/dvips//

% TrueType fonts
TTFONTS = .;$TEXMF/fonts/truetype//

% Type 42 outline fonts.
T42FONTS = .;$TEXMF/fonts/type42//

% PostScript AFM metric files.
AFMFONTS = .;$TEXMF/fonts/afm//

```

```
% Dvips' config.* files (this name should not start with 'TEX'!).
TEXCONFIG = .;$TEXMF/dvips//

% Makeindex style (.ist) files.
INDEXSTYLE = .;$TEXMF/makeindex//

% Used by DMP (ditroff-to-mpx), called by makempx -troff.
TRFONTS = /usr/lib/font/devpost
MPSUPPORT = .;$TEXMF/metapost/support

% For xdvi to find mime.types and .mailcap, if they do not exist in
% $HOME.  These are single directories, not paths.
% (But the default mime.types, at least, may well suffice.)
MIMELIBDIR = $TEXMFMAIN/etc
MAILCAPLIBDIR = $TEXMFMAIN/etc

XDVIINPUTS=.;$TEXMF/{xdvi,web2c}

TEX4HTINPUTS=.;$TEXMF/tex4ht//

% TeX documentation and source files, for use with kpsewhich.
TEXDOCS = .;$TEXMF/doc//
TEXSOURCES = .;$TEXMF/source//

% Omega-related fonts and other files.
OFMFONTS = .;{$TEXMF/fonts;$VARTEXFONTS}/{ofm;tfm}//;$TFMFONTS
OPLFONTS = .;{$TEXMF/fonts;$VARTEXFONTS}/opl//
OVFFONTS = .;{$TEXMF/fonts;$VARTEXFONTS}/ovf//
OVPFONTS = .;{$TEXMF/fonts;$VARTEXFONTS}/ovp//
OTPINPUTS = .;$TEXMF/omega/otp//
OCPINPUTS = .;$TEXMF/omega/ocp//

% Where the support for the mktex scripts is found.  A single directory,
% not a path.
MKTEXSCRIPT = $TEXMFMAIN/web2c

%% The mktex* scripts rely on KPSE_DOT. Do not change it.
KPSE_DOT = .

% This definition isn't used from this .cnf file itself (that would be
% paradoxical), but the compile-time default in paths.h is built from it.
% The SELFAUTO* variables are set automatically from the location of
% argv[0], in kpse_set_progname.
%
% About the /. construction;
% 1) if the variable is undefined, we'd otherwise have an empty path
%    element in the compile-time path.  This is not meaningful.
% 2) if we used /$VARIABLE, we'd end up with // if VARIABLE is defined,
%    which would search the entire world.
%
```

```
% The TETEXDIR stuff isn't likely to relevant unless you're using teTeX,
% but it doesn't hurt.
TEXMFCNF = .:{$SELFAUTOLOC:$SELFAUTODIR:$SELFAUTOPARENT}
     {:{/share:}/texmf/web2c}:/.$TETEXDIR:/.$TEXMF/web2c:$TEXMF/web2c

%  Part 2; Non-path options.

% Write .log/.dvi/etc. files here, if the current directory is unwritable.
% TEXMFOUTPUT = /tmp

% If a dynamic file creation fails, log the command to this file, in
% either the current directory or TEXMFOUTPUT.  Set to the
% empty string or  0  to avoid logging.
MISSFONT_LOG = missfont.log

% Set to a colon-separated list of words specifying warnings to suppress.
% To suppress everything, use TEX_HUSH = all; this is equivalent to
% TEX_HUSH = checksum;lostchar;readable;special
TEX_HUSH = none

% Enable system commands via \write18{...}?
shell_escape = f

% Allow TeX \openout on filenames starting with `.' (e.g., .rhosts)?
% a (any)        : any file can be opened.
% r (restricted) : disallow opening "dotfiles".
% p (paranoid)   : as 'r' and disallow going to parent directories, and
%                  restrict absolute paths to be under $TEXMFOUTPUT.
openout_any = p

% Enable the mktex... scripts by default?  These must be set to 0 or 1.
% Particular programs can and do override these settings, for example
% dvips's -M option.  Your first chance to specify whether the scripts
% are invoked by default is at configure time.
%
% These values are ignored if the script names are changed; e.g., if you
% set DVIPSMAKEPK to `foo', what counts is the value of the environment
% variable/config value `FOO', not the `MKTEXPK' value.
%
% MKTEXTEX = 0
% MKTEXPK = 0
% MKTEXMF = 0
% MKTEXTFM = 0

% What MetaPost runs to make MPX files.  This is passed an option -troff
% if MP is in troff mode.  Set to `0' to disable this feature.
MPXCOMMAND = makempx

%  Part 3; Array and other sizes for TeX (and Metafont and MetaPost).
%
```

```
% If you want to change some of these sizes only for a certain TeX
% variant, the usual dot notation works, e.g.,
% main_memory.hugetex = 20000000
%
% If a change here appears to be ignored, try redumping the format file.

% Memory. Must be less than 8,000,000.
%
% main_memory is relevant only to initex, extra_mem_* only to non-ini.
% Thus, have to redump the .fmt file after changing main_memory; to add
% to existing fmt files, increase the other. (To get an idea of how
% much, try \tracingstats=2 in your TeX source file;
% web2c/tests/memtest.tex might also be interesting.)
%
% To increase space for boxes (as might be needed by, e.g., PiCTeX),
% increase extra_mem_bot.
%
% max length of input lines or control sequence names
buf_size = 50000
buf_size.context = 50000
%
% extra low memory for boxes, glue, breakpoints, etc.
extra_mem_bot = 0
%
% extra high memory for chars, tokens, etc.
extra_mem_top = 0
%
% Total number of fonts. Must be >= 50 and <= 2000 (without tex.ch changes).
font_max = 1000
%
% Words of font info for TeX (total size of all TFM files, approximately).
font_mem_size = 200000
font_mem_size.hugetex = 400000
%
% Extra space for the hash table of control sequences
hash_extra = 0
hash_extra.context = 15000
hash_extra.hugetex = 10000
hash_extra.pdftex = 10000
hash_extra.pdflatex = 10000
%
% number of hyphenation exceptions, >610 and <32767.
hyph_size = 1000
%
% words of memory available; also applies to mf&mp
main_memory = 263000
main_memory.context = 1100000
main_memory.hugetex = 1100000
%
% simultaneous input files and error insertions
```

```
max_in_open = 15
%
% max number of strings
max_strings = 15000
max_strings.context = 55000
max_strings.hugetex = 55000
max_strings.pdftex = 20000
max_strings.pdflatex = 20000
%
% simultaneous semantic levels (e.g., groups)
nest_size = 100
nest_size.context = 500
%
% simultaneous macro parameters
param_size = 500
param_size.context = 1500
%
% min pool space left after loading .fmt
pool_free = 5000
pool_free.context = 47500
%
% Max number of characters in all strings
pool_size = 125000
pool_size.context = 500000
pool_size.hugetex = 500000
pool_size.pdftex = 200000
pool_size.pdflatex = 200000
%
% for saving values outside current group
save_size = 4000
save_size.context = 5000
save_size.hugetex = 30000
%
% simultaneous input sources
stack_size = 300
stack_size.context = 1500
%
% Minimum pool space after TeX/MP's own strings;
% must be at least 25000 less than pool_size,
% but doesn't need to be nearly that large.
string_vacancies = 25000
string_vacancies.hugetex = 45000
string_vacancies.context = 45000
%
% Hyphenation trie. As distributed, the maximum is 65535; this should
% work unless 'unsigned short' is not supported or is smaller than 16
% bits. This value should suffice for UK English, US English, French,
% and German (for example). To increase, you must change
% 'ssup_trie_opcode' and 'ssup_trie_size' in tex.ch (and rebuild TeX);
% the trie will then consume four bytes per entry, instead of two.
```

```
%
% US English, German, and Portuguese; 30000.
% German; 14000.
% US English; 10000.
%
trie_size = 64000

% for Omega
ocp_buf_size = 20000        % character buffers for ocp filters.
ocp_stack_size = 10000        % stacks for ocp computations.
ocp_list_size = 1000        % control for multiplce ocps.

% These work best if they are the same as the I/O buffer size, but it
% doesn’t matter much. Must be a multiple of 8.
dvi_buf_size = 16384 % TeX
gf_buf_size = 16384 % MF

% It’s probably inadvisable to change these. At any rate, we must have;
% 45 < error_line < 255;
% 30 < half_error_line < error_line - 15;
% 60 <= max_print_line;
% These apply to Metafont and MetaPost as well.
error_line = 79
half_error_line = 50
max_print_line = 79
```

B Catalogue of Packages

Table 2: **TeX Live** packages

Package	*Collection*	*Description*
2up	generic3/2up	Allows one to print a document two-up, with considerable flexibility as to paper size and layout. It produces a standard dvi file, and does not involve an additional dvi or PostScript filter. It should work with most TeX macro packages
a0poster	latex3	A LaTeX class providing fonts in sizes of 12pt up to 107pt. It also makes sure that in math formulas the symbols appear in the right size. This package also creates a postscript header file for dvips which ensures that the poster will be printed in the right size. Sizes DIN A0, DIN A1, DIN A2 and DIN A3 are also supported.
a4	latex3	Originally for LaTeX 2.09 but updated for LaTeX 2_ε. Mostly superseded by native LaTeX 2_ε support for a4 paper but defines the extra option of widemargins. The geometry package is usually what you are looking for though.
aaai	latex3	AAAI style.
accents	latex3	A package for multiple accents with nice features concerning creation of accents and placement of scripts.
achemso	latex3	LaTeX and BibTeX 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.
adfathesis	latex3	A class that satisfies the requirements of the Australian Defence Force Academy (a college of the University of New South Wales).
adrlist	latex3	Using address lists in LaTeX.
ae	fonts3	A set of virtual fonts which emulates T1 coded fonts using the standard CM fonts. The package is called AE fonts (for Almost European). The main use of the package is to produce PDF files using Type1 versions of the CM fonts instead of the bitmapped EC fonts.
aguplus	latex3	Styles for American Geophysical Union.
aiaa	latex3	A bundle of LaTeX/BibTeX 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)
alatex	formats3	An extended LaTeX with better modularity
alg	latex3	LaTeX environments for typesetting algorithms
algorithms	latex3	Defines a floating algorithm environment designed to work with the algorithmic package.
alpha-osf3.2	systems1	System binaries for Alpha running OSF 3.2.
alpha-osf4.0	systems1	System binaries for Alpha running OSF 4.0.
altfont	latex3	A generalised replacement for some parts of psnfss and mfnfss. Similar to psfont with the PostScript specific code removed.
amiga	systems1	An Amiga port of the complete UNIX-TeX system.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
amsfonts	ams2	A set of miscellaneous TEX fonts from the American Mathematical Society that augment the standard set normally distributed with TEX. 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 LATEX whose aim is superior information structure of mathematical documents and superior printed output.
amstex	ams2	American Mathematical Society plain TEX macros
answers	latex3	Styles for setting questions (or exercises) and answers.
antyktor	fonts3	Antykwa Toruńska is a serif font designed by the Polish typographer Zygfryd Gardzielewski. Reconstructed and digitized as Type1 by J. M. Nowacki.
apa	latex3	LATEX class and BIBTEX 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
asaetr	latex3	An attempt to mimic Transactions of the ASAE.
ascii	fonts3	Support for IBM extended ASCII font.
astro	fonts3	Astronomical (planetary) symbols.
aurora	dvips3	Header files for dvips to make colour separations
authorindex	latex3	A package to generate a list of all authors cited in a document along with a list of pages where these citations occur.
autotab	latex3	Generating tabular setups.
babel	latex1	Multilingual support for LATEX.
babelfmts	formats2	Extra LATEX format files with different default hyphenation patterns
backgammon	fonts3	Style for typesetting backgammon boards.
bakoma	fonts2	Computer Modern and AMS fonts in PostScript Type1 form.
barcode2	fonts3	??
barcodes	fonts3	Fonts for making barcodes.
barr	graphics3	Diagram macros by Michael Barr.
base	latex1	Basic LATEX system.
bayer	fonts3	An implementation of the universal font by Herbert Bayer of the bauhaus school for METAFONT. It is supported in LATEX with a package and font definition file.
bbding	fonts3	An NFSS-interface to the symbol font bbding containing many of the Zapf dingbats fonts.
bbm	fonts3	Blackboard variant fonts for Computer Modern, with LATEX support
bbtbase	bibtex1	Basic BIBTEX support files
bbtdoc	bibtex2	Basic BIBTEX documentation

Catalogue of Packages *continued*

Package	*Collection*	*Description*
beebe	bibtex2	Nelson Beebe's collection of TeX-related bibliographies, and BibTeX style files
beton	latex3	Typeset a LaTeX 2_ε document with the Concrete fonts designed by Don Knuth and used in his book "Concrete Mathematics".
bibarts	bibtex3	A package to assist in making bibliographical lists as are common in the arts. Includes a german manual with some commentary in the tex file in english.
biblist	latex3	BibTeX 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
booktabs	latex2	Nicer layout of tables
borceux	graphics3	Diagram macros by Francois Borceux
bosisio	latex3	A collection of packages including: dblfont; graphfig; mathcmd; mathenv; quotes; sobolev
bridge	latex3	Macros for typesetting Bridge diagrams.
c-pascal	plain3	A TeX macro package for typesetting programs in C and Pascal. Program sources in C and Pascal can also be input.
calendar	latex3	A package for calendars and timetables. Includes, for example, a package which organizes date items in a format suitable for conference schedules, itineraries, academic teaching timetables and the like.
calrsfs	latex3	Nicer calligraphic letters.
camel	latex3	Comprehensive bibliography manager (prototype citation engine for LaTeX3). Will become BibTeX 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
catalog	doc2	Graham Williams Catalogue of TeX packages
cbgreek	fonts3	METAFONT source files for a complete set of Greek fonts.
cc-pl	fonts3/cc-pl	The Polish version of Computer Concrete fonts
ccfonts	latex	LaTeX font definition files for the Concrete fonts and a LaTeX package for typesetting documents using Concrete as the default font family. The files support OT1, T1, TS1, and Concrete math incl. AMS fonts (Ulrik Vieth's concmath).
cchess	fonts3	Macros and fonts for typesetting Chinese Chess board diagrams.
cd-cover	latex3	A package for typesetting CD covers.
cellular	plain3	Cellular table construction
changebar	latex2	Generate changebars in LaTeX documents.
chemcono	latex3	A LaTeX style file for using compound numbers in chemistry documents. It works like `\cite` and the `\thebibliography`, using `\fcite` and `\theffbibliography` 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.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
china2e	latex3	A LaTeX package to produce Chinese calendar symbols of the old Chinese lunisolar calendar.
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	A set of macros for drawing electric circuits containing fundamental elements, amplifiers, transistors, and basic logic gates to include in TeX, LaTeX, or similar documents.
cirth	fonts3	Fonts for Cirth
cite	latex2	Supports compressed, sorted lists of numerical citations: [8,11–16].
cm	fonts1	Computer Modern fonts
cmbright	fonts2	A family of sans serif fonts for TeX and LaTeX, based on Donald Knuth's CM fonts. It comprises OT1, T1 and TS1 encoded text fonts of various shapes as well as all the fonts necessary for mathematical typesetting, incl. AMS symbols. This collection provides all the necessary files for using the fonts with LaTeX.
cmcyralt	latex3	Alternative Russian encoding support
cmextra	fonts2	Extra Computer Modern fonts, from the American Mathematical Society
cmpica	fonts3	A Computer Modern Pica variant
cmpk	fonts3	Computer Modern fonts in PK format
cms	fonts2	
cmsd	latex3	A package including additional fd files. Its purpose is to provide an alternative interface to the CM Sans Serif boldface fonts. The EC (T1, Cork) encoded versions of the 'CM Sans Serif boldface extended' fonts differ considerably from the traditionally (OT1) encoded ones: At large sizes, ¿ 10pt, they have thinner strokes and are much wider. At 25pt they are hardly to be recognized as being 'boldface'. This package attempts to make these T1 fonts look like the traditional ones did. You do not need any new fonts; the package just changes the way LaTeX makes use of the current ones.
codepage	latex3	Support for variant code pages.
colorsep	dvips3	Support for colour separation when using dvips
colortab	plain3	Lets you shade or color the cells in the alignment environments such as `\halign` and LaTeX's tabular and array environments.
concmath	fonts3	Concrete math fonts derived from Computer Modern math fonts using parameters from Concrete text fonts. A LaTeX package providing the necessary font definition code is included.
concrete	fonts3	A wrapper to load up the appropriate packages to use the concrete fonts.
context	generic3	A full featured, parameter driven macro package, which fully supports advanced interactive documents. ppchtex is a modeul that can be used to typeset chemical formulas.
count1to	latex3	A LaTeX package which sets count1 to count9, which can be used to select certain pages with a driver. Also provides access to the number of pages of the document. Uses the everyshi package.
croatian	lang3	Fonts for typesetting Croatian scripts

Catalogue of Packages *continued*

Package	*Collection*	*Description*
crossword	latex3	Macros for typesetting crossword puzzles.
crosswrd	latex3	??
csfonts	fonts2	Czech/Slovak-tuned METAFONT Computer Modern fonts.
cslatex	latex	LaTeX support for Czech/Slovak typesetting.
csplain	plain2	Plain TeX support for Czech/Slovak typesetting.
curves	graphics3	Draws curves in the LaTeX 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 BibTeX bibliography styles from a generic file using docstrip.
cyrillic	lang2/cyrillic	General support for LaTeX typesetting in Cyrillic (fonts, hyphenation patterns, Babel package etc
dancers	fonts3	Font for the Sherlock Holmes 'Dancing Men'
dates	latex3	Macros for parsing date strings.
deleq	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 LaTeX scripts
dinbrief	latex3	German letter DIN style.
directory	bibtex3	A package for LaTeX and BIBTeX that facilitates the construction, maintenance and exploitation of an address book like database.
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 TeX
dropping	latex3	A LaTeX 2_ε macro for dropping the first character(s) (or word(s)) of a paragraph. This is an extension of the LaTeX 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.

Package	*Collection*	*Description*
ec	fonts2	The ec fonts support the complete LaTeX 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 copyleft sign, and many others. Recent releases of LaTeX 2ε support the ec fonts. The dc fonts, which were termed as preliminary versions, will dissappear from the archives.
ecc	fonts3	The METAFONT sources and tfm files of the European Concrete Fonts. This is the EC implementation of Knuth's Concrete fonts, including also the corresponding text companion fonts.
edmac	plain3	A macro package for typesetting scholarly critical editions
eepic	graphics2	A set of TeX macros for LaTeX implementing several extensions to EPIC and the LaTeX 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 TeX memory, and providing several new commands for drawing ellipses, arcs, splines, and filled circles and ellipses.
eiad	latex3	Macros and EIAD fonts.
elsevier	latex3	Preprint style for Elsevier Science journals
elvish	fonts3	Font for typesetting Tolkien Elvish script
emp	latex3	A package for encapsulated MetaPost pictures in LaTeX. Useful for keeping illustrations in sync with the text. It also frees the user from inventing descriptive names for PostScript files that fit into the confines of file system conventions.
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
envbig	latex3	Printing addresses on envelopes
envlab	latex3	A LaTeX 2ε package for producing mailing envelopes and labels, including barcodes and address formatting according to the US Postal Service rules. Redefines the standard `\makelabels` command of the LaTeX 2ε 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.
eqname	latex3	Style for different equation numbering.
eqnarray	latex3	More generalised equation arrays with numbering.
esieecv	latex3	Curriculum vitæ for French.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
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.
everysel	latex3	LaTeX package which provides hooks into `\selectfont`.
everyshi	latex3	Hooks for taking action at every `\shipout`
exam	latex3	Package for typesetting exam scripts.
examdesign	latex3	Package for typesetting exams.
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.
fancybox	latex2	Provides variants of `\fbox`: `\shadowbox`, `\doublebox`, `\ovalbox`, `\Ovalbox`, with helpful tools for using box macros and flexible verbatim macros. You can box mathematics, floats, center, flushleft, and flushright, lists, and pages.
fancyhdr	latex3	Support for sophisticated control of page headers and footers in LaTeX 2_ε. It supersedes the older fancyheadings package which should no longer be used.
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 `\floatplacement{figure}{H}`.
floatfig	latex3	Allows text to be wrapped around figures.
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 LaTeX document.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
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.
foilhtml	latex3	Provides integration between FoilTeX and LaTeX2HTML. It adds sectioning commands and elements of logical formatting to FoilTeX and provides support for FoilTeX commands in LaTeX2HTML. It also supports automatic creation of LaTeX2HTML images with proper font sizes and shapes when converting FoilTeX documents.
foiltex	latex3	A LaTeX 2ε class for overhead transparencies. Can be used with fancybox to place a variety of borders around the slides.
fontinst	latex3	TeX macros for converting Adobe Font Metric files to TeX metric and virtual font format
fontname	texlive1	Karl Berry's scheme for naming fonts in TeX
fonts	latex1	Extra line and circle fonts for LaTeX
footbib	latex3	A package to put bibliographic references as footnotes.
footmisc	latex3	Sophisticated footnotes package for LaTeXcapturing as package options much (if not all) of the functionality of the various other footnote packages.
footnpag	latex3	Allows footnotes on individual pages to be numbered from 1, rather than being numbered sequentially through the document.
formats	texlive2	Prebuilt TeX 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 LaTeX class for writing letters.
fundus	latex3	Providing LaTeX access to various font families.
futhark	fonts3	Fonts for the Older Futhark script
g-brief	latex3	A document class for LaTeX 2ε. 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 **TeX Live** CD-ROM.
geometry	latex3	A package which allows LaTeX 2ε users to customise page layout (page sizes) using an easy and flexible user interface. For example `\geometry{body={6.5in,8.75in}, top=1.2in, left=2cm, nohead}`. This is an update of the now superseded pagesize package.
geomsty	latex3	Provides: inclusion of PostScript figures, and of TeX text within figures; automatic creation of index entries and cross-references where appropriate; no need to worry about fragile commands in almost all situations; greater versatility in defining theorem-like environments; proofing aids such as version numbers and a running index.
german	latex2	Style for German typography.
germbib	bibtex2	German variants of standard BibTeX styles.
go	fonts3	Fonts and macros for typesetting go games.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
gothic	fonts3	Gothic and ornamental initial fonts by Yannis Haralambous.
graphics	latex2	The primary LaTeX 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. For documentation see grfguide.
grnumalt	latex3	A package which implements a numbering system used in ancient Athens, producing the 'Athenian' numeral for any positive arabic numeral. The package can be used as a means to provide alternative counters.
guides	doc2	Guides to using LaTeX, in English, German, French and Greek
gustlib	plain3/gustlib	Various small utility packages for typesetting in plain TeX, with a Polish perspective
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 LaTeX picture environment.
hppa1.1-hpux10.10	systems1	System binaries HP running hpux10.10.
html	doc2	Various TeX documentation converted to HTML
hyper	latex3	Redefines LaTeX cross-referencing commands to insert `\special` commands for HyperTeX dvi viewers, such as recent versions of xdvi.
hyperref	latex3	Redefines LaTeX cross-referencing commands to insert `\special` commands for HyperTeX dvi viewers, or for translation to Adobe's PDF (Portable Document Format) for viewing on the Web with Acroread.
hyphen	lang1	Collection of hyphenation patterns.
i386-linux	systems1	System binaries for Intel machines 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.
imac	latex3	A set of files for producing correctly formated documents for the International Modal Analysis Conference.
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_ε.
info	doc2	Documentation in GNU info form
ini	texlive1	Startup files for building formats
inputenc	latex3	Controlling inpout encoding
insbox	generic3	A TeX macro for inserting pictures/boxes into paragraphs.
ipa	latex3	Style for using International Phonetic Alphabet fonts

Catalogue of Packages *continued*

Package	*Collection*	*Description*
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.
kdgreek	fonts3	Greek fonts.
kluwer	latex3	A LaTeX 2_ε class file for submissions of journal articles to Kluwer Academic Publishers Dordrecht, the Netherlands.
knuth	doc3	Knuth's own documentation, including the TeXbook and the METAFONTbook
koma-script	latex3	A drop-in replacement for the article/report/book classes with emphasis on European rules of typography and paper formats as laid down by Jan Tschichold. The article class, for example, becomes scrartcl.
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).
latex2html	doc3	A Perl program that translates LaTeX source files into HTML (HyperText Markup Language). For each source file given as an argument the translator will create a directory containing the corresponding HTML files.
leftidx	latex3	This package enables left subscripts and superscripts in math mode. These subscripts and superscripts are automatically raised for better fitting to the symbol they belong to.
lettrine	latex3	A package to typeset dropped capitals in various ways, typically those described in the French typographic books.
levy	latex3	Macros for using Silvio Levy's Greek fonts
lgc	doc3	Examples from the *LaTeX Graphics Companion*
lgreek	latex3	Macros for using Silvio Levy's Greek fonts
lineno	latex3	Adds line numbers to selected paragraphs with reference possible through the LaTeX `\ref` and `\pageref` 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.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
linguex	latex3	A package to facilitate the formatting of linguist examples. Automatically takes care of example numbering, indentations, indexed brackets, and the "*" in grammaticality judgments. linguho.sty allows for automatic extraction of a handout from a file generated with linguex.sty.
listings	latex3	A package for typesetting listings using LaTeX 2ε. The source code is read directly by TeX. Keywords, comments and strings can be typeset using different styles, e.g., default is bold for keywords, italic for comments and no special style for strings.
localloc	latex3	Macros for localizing TeX register allocations
logic	fonts3	METAFONT font for drawing logic diagrams.
lollipop	formats3	A new generation format
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 2ε classes.
ltxmisc	latex2	Miscellaneous LaTeX styles.
lw35ps	fonts2	Font metrics and LaTeX font description files for standard 35 PostScript fonts.
ly1	latex3	Support for LY1 LaTeX encoding, i.e. the Y&Y texnansi encoding.
mailing	latex3	Macros for mail merging
makeindex	texlive1	A general purpose hierarchical index generator; it accepts one or more input files (often produced by a text formatter such as TeX or troff, sorts the entries, and produces an output file which can be formatted. The formats of the input and output files are specified in a style file; by default, input is assumed to be a idx file, as generated by LaTeX.
malayalam	lang3	Fonts for typesetting Malayalam, with a pre-processor
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.
margbib	latex3	A package for displaying bibliography tags in the margins.
mathcomp	latex2	A package which provides access to some interesting characters of the Text Companion fonts (TS1 encoding) in math mode.
mathematica	fonts3	Virtual TeX fonts that can be used with the PostScript fonts distributed with Mathematica 3.0. The archives use a TDS conforming directory structure. A style file for LaTeX2e is included, that enables use of the fonts and the new symbols from LaTeX2e.
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 LaTeX's `tabular` and `array` environments, verbatim handling, and syntax diagrams.
metasupp	texlive1	MetaPost support files

Catalogue of Packages *continued*

Package	*Collection*	*Description*
mex	formats2	MeX is an adaptation of Plain TeX and LaTeX209 formats to the Polish language and to the Polish printing customs. It contains a complete set of METAFONT sources of Polish fonts, hyphenation rules for the Polish language and sources of formats.
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 TEX makes up a mf file to generate the required font; this package is not integrated with NFSS (or MakeTeXTFM) yet fun.
mflogo	latex1	LATEX package and font definition file to access the Knuthian 'logo' fonts described in 'The METAFONTbook' and the METAFONT and MetaPost logos in LATEX 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.
mft	texlive1	
mftoeps	fonts3	Converts MF to EPS.
midnight	generic3	A set of useful macro tools
minitoc	latex3	Produce a table of contents for each chapter.
mips-irix5.3	systems1	System binaries for SGI box running Irix 5.3.
mips-irix6.2	systems1	System binaries for SGI box running Irix 6.2.
misc209	latex2	Miscellaneous small macro files for LATEX2.09.
mnras	plain3	Styles for the Monthly Notices of the Royal Astronomical Society.
monster	latex3	Towards a more rational and modular LATEX, by Matt Swift; a set of powerful tools
montex	fonts3	MonTeX provides Mongolian support for LATEX2e (now Cyrillic, but soon also Classical Mongolian).
morehelp	latex3	A package to enhance LATEX 2ε error messages by providing descriptions of the possible causes including those that may not be obvious. This style is effectively an online substitute for error lists found in the LATEX books, although it cannot completely replace them. Only true LaTeX errors are included, TeX errors are beyond the reach of ordinary macros.
moresize	latex3	A LATEX 2ε package for using font sizes up to 35.88pt, for example with the new EC fonts. New commands `\HUGE` and `\ssmall` for selecting font sizes are provided together with some options working around current LATEX 2ε shortcomings in using big font sizes. The package also provides options for improving the typesetting of paragraphs (or headlines) with embedded math expressions at font sizes above 17.28pt.
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.
morse	fonts3	A package for printing Morse code signs.
mpbase	metapost1	Basic MetaPost support files.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
mpfnmark	latex3	A package which provides the command `\mpfootnotemark`, which can be used in the same way as `\footnotemark`. The difference between these two macros is that within minipage environments the latter uses the standard footnote marker style (defined by `\thefootnote`), while the new command uses the minipage footnote marker style (defined by `\thempfootnote`).
mslapa	latex3	LaTeX and BibTeX style files for a respectably close approximation to APA (American Psychological Association) citation and reference style.
mtbe	plain3	Examples from *Mathematical TeX by Example* by Arvind Borde
multenum	latex3	Multi-column enumerated lists
multi	dvips3	dvips header for making n-up pages
multido	generic2/multido	Provides a generic loop macro for use in any TeX macro package
musictex	generic3	Typesetting music with TeX.
musixtex	generic3	Extended MusicTeX, with better slurs
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. This has been superseded by ntheorem
niceframe	latex3	Support for fancy framing of pages
nomencl	latex3	Nomenclature package for producing lists of symbols using the capabilities of the MakeIndex program.
ntgclass	latex2	Versions of the standard LaTeX article and report classes, rewritten to reflect a more European design, by the Dutch TeX Users Group
ntheorem	latex3	A package for handling theorem-like environments. Aditionally to several features for defining the layout of theorem-like environments which can be regarded to be standard requirements for a theorem-package, it provides solutions for two related problems: placement of endmarks and generation of lists of theorem-like environments. In contrast to former approaches, it solves the problem of setting endmarks of theorem-like environments (theorems, definitions, examples, and proofs) automatically at the right positions, even if the environment ends with a displaymath or (even nested) list environments; it also copes with the amsmath package. This is done in the same manner as the handling of labels by using the aux file. It also introduces the generation of lists of theorem-like environments in the same manner as listoffigures.
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-B
ogham	fonts3	Fonts for typesetting Ogham script

Catalogue of Packages *continued*

Package	*Collection*	*Description*
ogonek	latex3	Support for Polish typography and the ogonek
oldstyle	latex3	Font information needed to load the `cmmi` and `cmmib` 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
overpic	latex3	The overpic environment is a cross between the LaTeX picture environment and the `\includegraphics` command of graphicx. The resulting picture environment has the same dimensions as the included eps graphic. LaTeX commands can be placed on the graphic at defined positions. A grid for orientation is available.
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.
pawpict	latex3	A package for easy inclusion of graphics made by PAW (Physics Analysis Workstation). You need to have PAW installed on your system to bennefiet from this package.
pb-diagram	latex3	Diagram package, using LAMSTeX fonts, by Paul Burchard.
pdcmac	plain3	Damian Cugley's macro tools.
pdftex	plain2	Macro packages for variant TeX which writes PDF format.
phonetic	fonts3	METAFONT Phonetic fonts, based on Computer Modern
physe	formats3	PHYSE format
phyzzx	formats3	A TeX format for physicists
picinpar	latex3	Insert pictures into paragraphs. (NOTE: Piet van Oostrum does not recommend this package. Picins is recommended instead.)
picins	latex3	Insert pictures into paragraphs.
pictex	graphics2	Picture drawing macros for LaTeX.
piff	latex3	Macro tools by Mike Piff
pl	latex3	Literate Programming for Prolog with LaTeX.
pl-mf	fonts3	Polish extension of Computer Modern fonts in MF sources.
pl-qx	fonts3/pl-qx	LaTeX support for extra Polish fonts (Antyktor etc)
plainmisc	plain1	Miscellaneous useful macros for plain TeX
plaintex	plain1	Basic Plain TeX macros
platex	latex3	PLaTeX provides tools to typeset documents in Polish using LaTeX2e. It can use Polish fonts (so-called PL fonts), EC fonts, it can be usefull even one has only CM fonts.
plgraph	generic3	LaTeX graphics package with wrapper to allow it to be used with generic plain TeX

Catalogue of Packages *continued*

Package	*Collection*	*Description*
plpsfont	fonts3	Polish extension of Computer Modern fonts, PL fonts in PostScript T1 format. Use the same tfm files as for pk fonts generated by METAFONT.
pmgraph	latex3	A set of extensions to LaTeX 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.
polish	doc3/polish	General TeX and LaTeX documentation in Polish
polyglot	latex3	A package for LaTeX2e multilingual support.
prelim2e	latex3	Allows the marking of preliminary versions of a document.
prettyref	latex3	Additional functionality to LaTeX 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 TeX/LaTeX 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.
psafm	fonts3	AFM files for PostScript fonts
psfonts	fonts2	PostScript fonts for use with TeX and LaTeX.
psfrag	graphics2	A set of macros and a PostScript header which allows LaTeX 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 LaTeX construction that the user specifies, properly aligned, scaled, and/or rotated.
psizzl	formats3	A TeX format from SLAC
pslatex	latex2	A small package that makes LaTeX 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 LaTeX 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 LaTeX 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 LaTeX picture macros to use PostScript `\special` commands
pspk	fonts3	PK files for common PostScript fonts

Catalogue of Packages *continued*

Package	*Collection*	*Description*
pstricks	graphics2	An extensive collection of PostScript macros that is compatible with most TeX macro packages, including Plain TeX, LaTeX, AMS-TeX, and AMS-LaTeX. 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
qfonts	fonts3	Public domain Adobe Type 1 fonts; so far only Quasi-Palladio (regular, italic, bold and bold italic), based on URW's Palladio, is available; the design of Palladio, alike the design of the obsolete Platan, resembles the design of Hermann Zapf's Palatino. (PFB, AFM, PFM, TFM and ENC files for TeX-ers, DOC).
qobitree	graphics3	LaTeX 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
quotchap	latex3	A package for creating decorative chapter headings with quotations, a PostScript output device and the psnfss package are needed, the color package and a greyscale output device are recommended.
r-und-s	latex3	This package decodes the german 'R- und S-Sätze', which are numerically coded security advice for chemical substances into plain text. This is e.g., used to compose security sheets or lab protocols and especially useful for students of chemistry.
ragged2e	latex3	LaTeX package which defines new commands **`\Centering`**, **`\RaggedLeft`**, and **`\RaggedRight`** and new environments Center, FlushLeft, and FlushRight, which set ragged text and are easily configurable to allow hyphenation.
rcs	latex3	Use RCS (revision control system) tags in LaTeX documents.
realcalc	plain3	Macros for real arithmetic calculations.
refcheck	latex3	Intended to check references in a document, looking for numbered but unlabelled equations, for labels, which are not used in the text, for unused bibliography references. It can also display label names in text near corresponding numbers of equations and/or bibliography references.
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 LaTeX 2_ε.
rlepsf	generic3	A macro package for use with epsf.tex which allows PostScript labels in an eps file to be replaced by TeX labels.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
rmpage	latex3	A package to help change page layout parameters in LaTeX. It lets you change page layout parameters in small steps over a range of values using options. It can set `\textwidth` appropriately for the main fount, and ensure that the text fits inside the printable area of a printer. An rmpage-formatted document can be typeset identically without rmpage after a single cut and paste operation. Local configuration can set defaults: for all documents; and by class, by printer, and by paper size. The geometry package is better if you want to set page layout parameters to particular measurements.
rotating	latex2	A package built on the standard LaTeX graphics package to perform all the different sorts of rotation one might like, including complete figures and tables and captions.
rotfloat	latex3	Rotate floats.
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-aix4.1.4.0	systems1	System binaries for RS6000 running AIX 4.1.4.0.
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.
schedule	latex3	A package intended to automatically format weekly schedules using LaTeX's picture environment. It requires the packages calc and color. Its main feature is the accuracy with which appointments are represented: boxes drawn to represent a particular appointment are accurate to the minute – i.e., a 31 minute appointment will have a box 1/60th longer than a 30 minute appointment. A number of features are included to allow the user to customize the output.
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 `\setstretch{baselinestretch}` command is supported. The spacing environment takes one argument which is the baselinestretch to use, e.g., `\begin{spacing}{2.5}`.
shadbox	latex3	A tool to shade the background of any box – text, figure, table etc. – using Plain (La)TeX.
shadethm	latex3	Package that allows declarations of the form `\newshadetheorem{thm}{Theorem}` or `\newshadetheorem{}[]{}` or `\newshadetheorem{}{}[]` to produce shaded boxes from the usual command `\begin{theorem}` ... `\end{theorem}`. The color package is required.
showlabels	latex3	Show label commands in the margin.
siam	generic3	Styles for SIAM publications

Catalogue of Packages *continued*

Package	*Collection*	*Description*
sidecap	latex3	Defines new LaTeX environments called SCfigure and SCtable (analogous to figure and table), to typeset captions sideways. Options include outercaption, innercaption, leftcaption and rightcaption.
siggraph	latex3	Document class for formatting papers according to the specifications for submission to the annual ACM Siggraph conference
simpsons	fonts3	Metafont source for Simpsons characters
slashbox	latex3	Draw an oblique (slash) line in a 'tabular' column in LaTeX
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 (`\scshape` is replaced by `\scfamily`). Thus you can write `\bf\scfamily\slshape` to get small caps bold slanted.
songbook	latex3	Package for typesetting song lyrics.
sparc-solaris2.5.1	systems1	System binaries for Sun Sparc running Solaris 2.5.1.
sparc-solaris2.6	systems1	System binaries for Sun Sparc running Solaris 2.6.
sparc-sunos4.1.4	systems1	System binaries for Sparc running SunOS 4.1.4.
sprite	graphics3	Macros to set bitmaps with TeX
ssqquote	latex3	LaTeX package and font definition file to access the 'cmssq' fonts, i.e. Computer Modern Sans Serif Quotation Style. The LaTeX package also defines a `chapterquotes` environment as an example application.
startex	formats3	A TeX 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 TeX and LaTeX.
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. Generally longtabl is a little easier to use and more flexible.
swift	latex3	Miscellaneous macros by Matt Swift.
tabbing	latex3	A package offering a variant of the tabbing environment which allows accented letters.
tap	plain3	An advanced, however easy table package. With PostScript allows shaded/coloured tables with diagonal rules. Plain, LaTeX etc.
taylor	graphics3	Diagram macros by Paul Taylor.
tbe	plain3	Examples from Arvind Borde's *TeX by Example*
tds	doc1	TDS (TeX Directory Structure documentation.
tengwar	fonts3	Font for typesetting Tolkien Tengwar script, by Michael Urban
tex-ps	generic3	TeX PostScript.
tex4ht	latex2	Provide a configurable (La)TeX-based authoring system for hypertext.
texdraw	graphics3	Graphical macros, using embedded PostScript.
texip	formats3	Macros from *TeX in Practice*
texlive	texlive1	Basic material for **TeX Live**.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
texsis	formats3	TeXsis is a Plain TEX macro package which provides useful features for typesetting research papers and related documents. For example, it includes support specifically for: Automatic numbering of equations, figures, tables and references; Simplified control of type sizes, line spacing, footnotes, running headlines and footlines, and tables of contents, figures and tables; Specialized document formats for research papers, preprints and "e-prints," conference proceedings, theses, books, referee reports, letters, and memoranda; Simplified means of constructing an index for a book or thesis; Easy to use double column formatting; Specialized environments for lists, theorems and proofs, centered or non-justified text, and listing computer code; Specialized macros for easily constructing ruled tables. TeXsis was originally developed for physicists, but others may also find it useful. It is completely compatible with Plain TeX.
text1	formats3	TEX 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 TEX and LATEX. 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.
thumb	latex3	A package for making running thumb marks in documents.
timesht	latex3	Package for typesetting time sheets.
timing	latex3	Fonts and macro package for drawing timing diagrams.
tipa	fonts3	Fonts and macros for IPA phonetics characters.
titlesec	latex3	A package providing a friendly interface to sectioning commands. You can select among various title styles or change the font of all headings with a single command. It provides simple one-step page styles, too.
tools	latex2	Standard LATEX 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 LATEX, using an external C program to do much of the hard work.
tug	doc3	TEX Users Group information
tugboat	generic2	LATEX macros for TUGboat articles.
type1	fonts2	Public domain PostScript Type1 fonts, including the URW fonts distributed with Ghostscript

Catalogue of Packages *continued*

Package	*Collection*	*Description*
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 LaTeX restricts the cm fonts to discrete sizes.
typehtml	latex3	Typeset HTML (i.e., World Wide Web documents) directly from LaTeX. Can handle almost all of HTML2, and most of the math fragment of the draft HTML3.
uaclasses	latex3	This package provides a LaTeX 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 LaTeX 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 LaTeX.
useful	doc2	Useful documentation; various LaTeX guides, FAQ, fontname docs, etc.
utthesis	latex3	University of Toronto thesis style.
uwthesis	latex3	University of Washington thesis
vdm	latex3	Typesetting VDM schemas
vector	latex3	Macros for more convenient representation of vectors in LaTeX 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.
vrb	latex3	Verbatim macros via plain TeX
vrsion	latex3	Defines a command which produces a version number in the dvi-file when LaTeX 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/LaTeX 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.

Catalogue of Packages *continued*

Package	*Collection*	*Description*
wnri	fonts3	METAFONT fonts for Old English, Indic languages in transcription, and American Indian languages.
wsuipa	fonts2	Washington State University IPA phonetic fonts
xtcapts	latex3	Defining language-depend text macros
xymtex	latex3	Typesetting chemical structures.
xypic	graphics2	A package for typesetting a variety of graphs and diagrams with TeX. Xy-pic works with most formats (including LaTeX, AMS-LaTeX, AMS-TeX, and plain TeX), in particular Xy-pic is provided as a LaTeX2e 'supported package'.
yannisgr	fonts3	Greek fonts by Yannis Haralambous
yfonts	latex2	A LaTeX interface to the old-german fonts designed by Yannis Haralambous: Gotisch, Schwabacher, Fraktur and the baroque initials.
yhmath	latex3	Extended maths fonts for LaTeX.
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.
yplan98	latex3	Print a vertical-type daily planner (i.e., months along the top, days downwards), with each 6-month period fitting onto a single A4 (or US letter) sheet.
ytex	formats3	Macro package developed at MIT.
zed-csp	latex3	Typesetting Z and CSP format specifications
zefonts	fonts2	Virtual T1 encoded Computer Modern fonts based on (OT1) Computer Modern, Times, and Helvetica fonts, intended to simulate 'dc' fonts. (Waine Sullivan's 'dm' fonts are another approach to the substitution of 'dc' fonts by virtual ones.)