MiKTeX Local Guide

Revision 1.11 (MiKTeX 1.11)
August 1998

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1 What is MiKTeX?

MiKTeX is an implementation of TeX and friends for Windows 95 and Windows NT.

MiKTeX Features

- Native Win32 implementation with support for long filenames
- Easy to install (and easy to uninstall)
- TeXLive3 compatible: style files, fonts and the like can be read from a TeXLive3 CDROM
- Network friendly:
  - Integrates well into a heterogeneous TeX environment
  - Supports UNC filenames
  - Supports multiple TEXMF directory trees
  - Uses a filename database for efficient file access
- TDS (TeX Directory Standard) compliant
- On-the-fly generation of font files
- Free distribution (full source code available)

Components

The MiKTeX distribution contains the following applications:

TeX 3.14159
: The classic TeX compiler.

LaTeX
: The LaTeX compiler.

YAP 0.94f
: A DVI previewer.

pdfTeX 0.12l
: Creates PDF files from TeX documents.

Omega 1.5
: An enhanced version of TeX with support for 16-bit character sets (e.g. Unicode). See 'http://www.ens.fr/omega', for more information.

METAFONT 2.718
: Converts font specifications into raster fonts.

MetaPost 0.632
: Converts picture specifications into PostScript commands.

dvips 5.76
: Converts DVI files into PostScript.

MakeIndex 2.12
: Composes indexes.

BibTeX 0.99c
: Composes bibliographies.

Standard LaTeX Packages
: AMS-LaTeX, Babel, PSNFSS, ...

TeXware, MFware, PSutils, ...
: Lots of utilities.

What is it not?

Most of the programs that come with MiKTeX are command line oriented, i.e., you will miss a graphical user interface.

MiKTeX does not run under Windows 3.1.

1.1 How to get MiKTeX

MiKTeX is archived in the CTAN[1] directory `systems/win32/miktex`.

Currently there are three participating CTAN nodes:

```
ftp.dante.de
ftp.tex.ac.uk
tug2.cs.umb.edu
```

1.2 The MiKTeX Project Page

Visit the MiKTeX Project Page at 'http://www.snafu.de/~cschenk/miktex' for information about new releases, patches and so on.

1.3 The MiKTeX Mailing Lists

MiKTeX Discussion

Claus Ekstroem from Denmark has created a discussion list for MiKTeX. To join this list, send an e-mail to ⟨`miktex-request@dsts.dk`⟩ which contains the word **subscribe** as the first line in the message body.

MiKTeX Announcements

This list is for announcements regarding new versions, bugs, etc. It is a low traffic list (max. 1 message in a week). It's not a discussion list.

To join the list, fill out the form on the MiKTeX Project Page.

[1] CTAN: Comprehensive TeX Archive Network

1.4 Documentation

The Local Guide (which you are reading right now) concentrates on documenting MiKTeX implementation details.

There are other sources of information available:

`doc\miktex\yap.hlp`
: YAP Users'Guide.

`doc\miktex\running.pdf`
: Explains how to make best use of pdfTeX. You will need a PDF viewer (e.g. Adobe Acrobat) in order to view this document.

`doc\latex\help\latex2e.hlp`
: LaTeX2e Reference Manual.

2 What's new in MiKTeX 1.11?

Highlights

- New setup utility (InstallShield)
- Several distribution types
- Uninstall support
- Support for a local TEXMF tree
- Previewer improvements:
  - Support for BMP/EPS graphics inclusions
  - Magnifying glass (variable magnification)
  - Support for Dvips (PostScript) specials
  - Support for virtual fonts
  - Support for Type 1 outline fonts (via `ps2pk`)
  - Omega-generated DVI can be processed
  - Dvips/GhostScript interface for printing purposes
  - Some command keys accept a numerical prefix argument (for example, `9g` opens TEX page 9)
- Omega 1.5
- pdfTeX 0.12

Distributions

MiKTEX is now distributed in the form of four independent self-extracting setup utilities:

'`bare.exe`'
: The bare distribution includes executables only. It is suited for sites that already have a comprehensive TEXMF tree (e.g. a TEXLive3 CDROM).

'`basic.exe`'
: The basic distribution includes fundamental applications and macro packages.

'`advanced.exe`'
: The advanced distribution includes the basic distribution plus the following components:
  - pdfTEX 0.12l
  - Computer Modern PostScript Fonts
  - AMS-Fonts PostScript Fonts

'`complete.exe`'
: The complete distribution includes the advanced distribution plus the following components:
  - Omega 1.5
  - MetaPost 0.632
  - Texinfo macros and Makeinfo
  - Web System (Tangle, Weave, Tie)

YAP 0.94d

- Support for BMP/EPS graphics inclusions has been added. GhostScript is required for the display/printing of EPS figures.
- YAP now understands basic dvips (PostScript) specials.
- YAP can process virtual fonts: it's now possible to use PostScript Type 1 fonts (via `ps2pk`, see below).
- Dvips/GhostScript interface (for printing purposes).
- Customizable magnifying glasses.
- Some command keys accept a numerical prefix argument.

Hyphenation Patterns

Plain TEX only loads the the standard hyphenation patterns (`hyphen.tex`), i.e. it does not consult `language.dat`.

initexmf (fka configure)

- The MiKTEX configuration utility moved to the bin directory. Besides that, the executable was renamed in `initexmf.exe` (formerly `configure.exe`).
- New options:

`--find-lambda-input`
`--find-latex-input`
`--find-metafont-input`
`--find-metapost-input`
`--find-omega-input`
`--find-pdflatex-input`
`--find-pdftex-input`
`--find-tex-input`
: Find various input files. These options were introduced to test the find-file machinery.

`--mkpsres`
: Update the PS Resource Database (`psres.dpr`).

`--local-root`
: Define the location of the local TEXMF tree.

`--report` Show a configuration report.

makepk (aka MakeTeXPK)

- `makepk` now invokes `ps2pk` when a Type 1 outline font is available.

New Applications

- `ps2pk` converts Type 1 outline fonts into PK files. This utility is used by `makepk`.
- `gif2png` converts GIF files into PNG files.

Updated

- Omega 1.5; now with some documentation in '`c:\texmf\doc\omega`'.
- pdfTeX 0.12l; now with some documentation in '`c:\texmf\doc\pdftex`'.

3 Installing MiKTeX

1. Make sure that you have enough disk space.
2. Choose a location for the installation directory, say `c:\texmf`. This directory receives the files of the MiKTEX distribution.
3. You can cause MiKTEX to deposit newly created files (e.g. PK fonts) in a separate directory tree. This directory tree is called the *Local TEXMF Tree*. If you decide to create such a tree, then you must choose a name for its root directory, say `c:\localtexmf`.

   Benefits that a local tree provides include the following:

   - Faster file search: MiKTEX assumes that only the local tree can receive new fonts and the like, i.e. MiKTEX can trust in the filename database when the remaining (non-local) trees are searched for a file.
   - You can use the local tree for your own additions (macros, fonts).
   - Easier updates: You don't have to worry about future MiKTEX updates, since the local tree will not be overwritten by the setup program.
   - You can install the MiKTEX distribution on a read-only media.
4. Decide whether you want to incorporate a preexisting TEXMF tree. For example, if you have a TEXLive3 CD in CDROM drive `e:`, then it is possible to include `e:\texmf` in the MiKTEX search path.
5. Start the setup utility.
   a. When prompted for the installation directory, enter the name chosen in step 2.
   b. When prompted for the local TEXMF directory, enter the name chosen in step 3. Enter nothing, if you don't need a local tree.
   c. When prompted for the root directories of other TEXMF trees, enter a semicolon-separated list of preexisting TEXMF root directories. Enter nothing, if you just want to use the TEXMF tree that comes with MiKTEX.
6. The setup program updates '`autoexec.bat`'. You have to reboot your workstation before changes to this file will take effect.

You should now inspect the Dvips configuration file. You have to modify it, because it probably doesn't match your printer and paper size. See Chapter 7 [config.ps], page 27, for more information.

4 The MiKTEX directory tree

When you have installed MiKTEX, the TEXMF root directory (usually `c:\texmf`) contains the following sub-directories:

`bibtex` For BibTEX input files.

`doc` For user documentation.

`dvips` For dvips input files.

`fonts` For font files.

`makeindex`
For MakeIndex input files.

`metafont` For METAFONT input files.

`metapost` For MetaPost input files.

`miktex` For MiKTEX related files.

`omega` For Omega related files.

`pdftex` For pdfTeX related files.

`source` For source files.

`tex` For TEX input files.

Read *A Directory Structure for TEX Files* (`c:\texmf\doc\general\tds.dvi`) by the TUG Working Group on a TEX Directory Structure, for more information about the standard TEX directory hierarchy.

4.1 Contents of the MiKTEX directory

The MiKTEX directory (usually `c:\texmf\miktex`) is reserved for implementation dependend files. It contains five subdirectories:

`base` For `.base` (METAFONT base) files.

`bin` For executable files (see Section 4.1.1 [bin-Directory], page 9).

`config` Contains the global configuration file `miktex.ini` and the filename databases.
Furthermore, this directory contains the filename databases `texmf*.fndb`.

`fmt` For `.fmt` (TEX format) files.

`mem` For `.mem` (MetaPost Memory) files.

4.1.1 Contents of the `bin` directory

All MiKTEX executables are located in the directory `miktex\bin` relative to the TEXMF root directory.

`afm2tfm.exe`
: Converts an AFM (Adobe Font Metrics) file into a TFM (TEX Font Metrics) file.

`bigtex.exe`
: An alias for `tex.exe --mem-max=6000000`.

`bibtex.exe`
: Produces bibliographies in conjunction with LaTEX.

`bibtex8.exe`
: An 8-bit enhanced version of BibTEX.

`ctl3d32.dll`
: A library used by `yap.exe`.

`dvi.dll` DVI interpreter used by `yap.exe`.

`dvicopy.exe`
: Replaces in a DVI file all VF (Virtual Font) references by typesetting instructions.

`dvips.exe`
: Converts a DVI file to a PostScript file.

`dvitomp.exe`
: Converts a DVI file into a MetaPost input file.

`dvitype.exe`
: Lists the contents of a DVI file.

`epsffit.exe`
: Fits an encapsulated PostScript file (EPSF) into constrained size.

`extractres.cmd`
: Filter to extract resources from a PostScript document. Requires `perl.exe`.

`fixdlsrps.cmd`
: Filter to fix DviLaser/PS documents to work with PSUtils. Requires `perl.exe`.

`fixfmps.cmd`
: Filter to fix Framemaker documents so PSUTils work. Requires `perl.exe`.

`fixmacps.cmd`
: Filter to fix Macintosh documents to work with PSUtils. Requires `perl.exe`.

`fixpsditps.cmd`
: Filter to fix Transcript psdit documents to work with PSUtils. Requires `perl.exe`.

`fixpspps.cmd`
: Filter to fix PSPrint PostScript to work with PSUtils. Requires `perl.exe`.

`fixscribeps.cmd`
: Filter to fix Scribe documents to work with PSUtils. Requires `perl.exe`.

`fixtpps.cmd`
: Filter to fix Tpscript documents to work with PSUtils. Requires `perl.exe`.

`fixwfwps.cmd`
: Filter to fix Word for Windows documents to work with PSUtils. Requires `perl.exe`.

`fixwpps.cmd`
: Filter to fix WordPerfect documents to work with PSUtils. Requires `perl.exe`.

`fixwwps.cmd`
: Filter to fix Windows Write documents to work with PSUtils. Requires `perl.exe`.

`gftodvi.exe`
: Converts a GF (Generic Font) file to a DVI file.

`gftopk.exe`
: Converts a GF (Generic Font) file to a PK (Packed Raster) font file.

`gftype.exe`
: Shows the contents of a GF (Generic Font) file.

`gif2png.exe`
: Converts GIF files into PNG files.

`hugetex.exe`
: An alias for `tex.exe --mem-max=20000000`.

`includeres.cmd`
: Filter to include resources in a PostScript document. Requires `perl.exe`.

`inimf.exe`
: An alias for `mf.exe --ini`.

`inimp.exe`
: An alias for `mp.exe --ini`.

`iniomega.exe`
: An alias for `omega.exe --ini`.

`inipdftex.exe`
: An alias for `pdftex.exe --ini`.

`initex.exe`
: An alias for `tex.exe --ini`.

`initexmf.exe`
: The MiKTEX configuration utility.

`lambda.exe`
: An alias for `omega.exe "&lambda"`.

`latex.exe`
: An alias for `tex.exe "&latex"`.

`makebase.exe`
: Utility to make a new METAFONT `.base` file.

`makefmt.exe`
: Utility to make a new TEX `.fmt` file.

`makeindex.exe`
: An index processor.

`makeinfo.exe`
: Converts a Texinfo file into an RTF/HTML file.
[See 'http://www.snafu.de/~cschenk/makeinfo' for more information.]

`makemem.exe`
: Utility to make a new MetaPost `.mem` file.

`makempx.exe`
: Extacts TEX code from a MetaPost input file.

`makepk.exe`
: Makes a PK (Packed Raster) font file.

`MakeTeXFMT.exe`
: An alias for `makefmt.exe`.

`MakeTeXPK.exe`
: An alias for `makepk.exe`.

`MakeTeXTFM.exe`
: An alias for `maketfm.exe`.

`maketfm.exe`
: Makes a TFM (TEX Font Metrics) file.

`mf.exe`
: The METAFONT compiler.

`mfc42.dll`
: Application framework used by `yap.exe`.

`mft.exe`
: Converts a METAFONT source file to a TEX file.

`miktex.dll`
: MiKTEX library shared by many applications.

`mkpsres.exe`
: Creates PostScript resource database files.

`mp.exe`
: The MetaPost compiler.

`mpost.exe`
: An alias for `mp.exe`

`mptotex.exe`
: Converts a MetaPost input file into TEX or LaTEX input file.

`msvcrt.dll`
: C-Runtime library shared by all applications.

`odvicopy.exe`
: Omega-enhanced version of `dvicopy.exe`.

`odvips.exe`
: Omega-enhanced version of `dvips.exe`.

`ofm2opl.exe`
: Converts an OFM (Omega Font Metrics) file to an OPL (Omega Property List) file.

`omega.exe`
: The Omega compiler.

`opl2ofm.exe`
: Converts an OPL (Omega Property List) file to an OFM (Omega Font Metrics) file.

`ovf2ovp.exe`
: Converts an OVF (Omega Virtual Font) file to an OVPL (Omega Virtual Property List) file.

`ovp2ovf.exe`
: Converts an OVPL (Omega Virtual Property List) file to an OVF (Omega Virtual Font) file.

`pdflatex.exe`
: An alias for `pdftex.exe "&latex"`.

`pdftex.exe`
: Classic TEX compiler which produces PDF.

`pltotf.exe`
: Converts a PL (Property List) file to a TFM (TEX Font Metric) file.

`png.dll` PNG (Portable Network Graphics) interpreter used by pdfTEX.

`pooltype.exe`
: Lists the contents of a pool file.

`ps2pk.exe`
: Create a PK font from a Type 1 Postscript font.

`psbook.exe`
: Rearranges pages from a PostScript file into signatures.

`psmerge.cmd`
: Filter to merge several PostScript file into one. Requires `perl.exe`.

`psnup.exe`
: Puts multiple logical pages onto each physical sheet of paper.

`psres.dll`
: Library used by `ps2pk`.

`psresize.exe`
: Rescales and centres a document on a different size of paper.

`psselect.exe`
: Selects pages from a PostScript file, creating a new PostScript file.

`pstops.exe`
: Shuffles pages in a PostScript file.

`ps2pk.exe`
: Makes PK files from PostScript Type 1 fonts.

`tangle.exe`
: Converts a Web file to a Pascal file.

`tex.exe`
: Classic TEX compiler.

`texindex.exe`
: Generates a sorted index.

`tftopl.exe`
: Converts a TFM (TEX Font Metrics) file to a PL (Property List) file.

`tie.exe`
: Merges several change files into one Web source file.

`ttf2afm.exe`
: Converts a TTF (TrueType Font) file to an AFM (Adobe Font Metrics) file.

`vftovp.exe`
: Converts a VF (Virtual Font) file to a VPL (Virtual Property List) file.

`virmf.exe`
: An alias for `mf.exe`.

`virmp.exe`
: An alias for `mp.exe`.

`viromega.exe`
: An alias for `omega.exe`.

`virpdftex.exe`
: An alias for `pdftex.exe`.

`virtex.exe`
: An alias for `tex.exe`.

`vptovf.exe`
: Converts a VPL (Virtual Property List) file to a VF (Virtual Font) file.

`weave.exe`
: Converts a Web file to a TEX file.

`yap.exe`
: DVI previewer.

`zlib.dll`
: Compression library used by pdfTEX.

5 MiKTeX Configuration Files

5.1 The Two Kinds of Configuation Files

MiKTeX configuration parameters are stored in two configurarion files:

- The *Global configuration files* contains site-wide configuration settings (i.e. settings shared by all MiKTeX users). The name of this file is `miktex.ini`. It is located in the directory `miktex\config` relative to the installation root directory (usually `c:\texmf`).
- The *personal configuration file* contains per-user configuration settings. The location of the personal configuration file can be defined with the help of `initexmf` (see Section 6.5 [Personal Configuration Files], page 24).

Personal configuration settings override global settings.

5.2 Contents of a MiKTeX Configuration File

A MiKTeX configuration file is divided into several named sections. Each section contains configuration entries for a specific application or feature.

5.2.1 General configuration settings

The section `[MiKTeX]` contains general configuration settings:

`Bin Directories`
: This search path is used by various utilities (e.g. `makepk.exe`) to locate other MiKTeX utilities (e.g. `mf.exe`).

  Standard value is `%R\miktex\bin`.

`Trace`
: This is a comma separated list of trace options:

  `notrace` Inhibits trace output to the console.

  `fndb` Traces the filename database.

  `filesearch` Traces the find-file machinery.

  `access` Traces file accesses.

5.2.2 TeX related configuration settings

The section `[TeX]` contains TeX-related configuration settings:

`Editor`
: The command which is startd when you press `e` in the error menu.

  Standard value is `notepad %f`.

  You can use the following placeholders:

  `%f` Will be replaced by the name of the input file that caused the error.

  `%h` Will be replaced by a help text.

`%l` Will be replaced by the line number.

`%m` Will be replaced by the error message.

`%t` Will be replaced by the name of the transcript file.

For example, a suitable value for WinEdt would be `winedt %f -G(1,%l,0) -S(12,+1,0)`.

`Font Metric Dirs`
The search path (see Section 5.2.16 [Search Paths], page 20) for `.tfm` (TEX Font Metric) files.

Standard is `.;%R\fonts\tfm//`.

`Font Metric Temp Dir`
The directory where newly created `.tfm` files will be installed. It must be in the `.tfm` search domain.

The specifiation may include special character sequences which are replaced at search-time:

`%s` The font supplier (e.g. `public`).

`%t` The typeface name (e.g. `cm`).

Standard value is `%R\fonts\tfm\%s\%t`.

Admin note: MiKTEX users must have permission to add files to the specified directory.

`Format Dirs`
Where plain TEX looks for format files.

Standard value is `%R\miktex\fmt//`.

`Input Dirs`
Where plain TEX looks for input files.

Standard value is `.;%R\tex//`.

5.2.3 LaTEX related configuration settings

The section `[LaTeX]` contains LaTEX related configuration settings:

`Input Dirs`
The search path for LaTEX input files.

Standard value is `.;%R\tex\latex//;%R\tex\generic//`.

5.2.4 Omega related configuration settings

The section `[Omega]` contains Omega related configuration settings:

`Font Metric Dirs`
Where Omega searches for Font Metric Files.

Standard value is `.;%R\fonts\ofm//;%R\fonts\tfm//`.

`Input Dirs`
: The search path for Omega input files.
Standard value is `.;%R\omega//;%R\tex//`.

`OCP Files`
: Where Omega searches for OCP files.
Standard value is `.;%R\omega\ocp//`.

5.2.5 Lambda related configuration settings

The section `[Lambda]` contains Lambda related configuration settings:

`Input Dirs`
: The search path for Lambda input files.
Standard value is `.;%R\omega\latex//;%R\tex\latex//;%R\omega\generic//;%R\tex\generic//`.

5.2.6 pdfTeX related configuration settings

The section `[pdfTeX]` contains pdfTeX related configuration settings:

`Input Dirs`
: Where pdfTeX searches for input files.
Standard value is `.;%R\pdftex//;%R\tex//`.

`T1 Font Dirs`
: Where pdfTeX searches for Type 1 fonts.
Standard value is `.;%R\fonts\type1//`.

`TeX PS Header Dirs`
: Where pdfTeX searches for font mapping files.
Standard value is `.;%R\pdftex\base//`.

`TrueType Font Dirs`
: Where pdfTeX searches for TrueType fonts.
Standard value is `.;%R\fonts\truetype//`

5.2.7 pdfLaTeX related configuration settings

The section `[pdfLaTeX]` contains pdfLaTeX related configuration settings:

`Input Dirs`
: Where pdfLaTeX searches for input files.
Standard value is `.;%R\pdftex//;%R\tex\latex//;%R\tex\generic//`.

5.2.8 METAFONT related settings

The section `[METAFONT]` contains METAFONT related configuration settings:

`Base Dirs` Search path (see Section 5.2.16 [Search Paths], page 20) for `.base` (METAFONT Base) files.
Standard value is `.;%R\miktex\base//`.

`Base Temp Dir`
: Where newly created base files are to be installed. This directory must be writable. It must be in `Base Dirs`. More than one directory can be specified; MiKTEX picks the first directory that is writable.

  Standard value is `%R\miktex\base`.

`Input Dirs`
: Search path for METAFONT input files.

  Standard value is `.;%R\fonts\source//;%R\metafont//`.

5.2.9 MetaPost related settings

The section `[MetaPost]` contains MetaPost related configuration settings:

`Input Dirs`
: Where MetaPost searches for input files.

  Standard value is `.;%R\metapost//`.

`Mem Dirs`
: Where MetaPost searches for format files.

  Standard value is `.;%R\miktex\mem//`.

`Mem Temp dir`
: Where newly created format files are to be installed. This directory must be writable. It must be in `Mem Dirs`. More than one directory can be specified; MiKTEX picks the first directory that is writable.

  Standard value is `%R\miktex\mem`.

5.2.10 MakeTeXPK related settings

The section `[MakeTeXPK]` contains configuration settings that are related to the auto-creation of packed raster fonts.

`PK File Name`
: PK file naming convention used by MiKTEX. The value can contain the following placeholders:

  `%f` The font name (e.g. `cmr10`).

  `%d` The horizontal resolution in dots per inch.

  The standard value is `%f.pk`.

`PK Temp Dir`
: The specification of a directory where newly created PK (Packed Raster Font) files will be installed. This directory must be in the search domain of PK files.

  The specifiation may include special character sequences which will be replaced at search-time:

  `%m` The current METAFONT mode.

  `%d` The horizontal resolution (in dots per inch).

`%s` The font supplier (e.g. `public`).

`%t` The typeface name (e.g. `cm`). `typeface.map`.

The standard value is `%R\fonts\pk\%m\%s\%t\dpi%d`.

Admin note: All MiKTEX users must have permission to create files in the specified directory.

5.2.11 ps2pk related settings

The section `[ps2pk]` contains configuration settings for the ps2pk utility

`PSResPath`
Where ps2pk searches for PS resource files.

Standard value is `%R\miktex\config`.

5.2.12 dvips related settings

The section `[Dvips]` contains dvips related configuration settings:

`DVIPSHEADERS`
Search path (see Section 5.2.16 [Search Paths], page 20) for dvips header files (including `.pfb` files).

Standard value is `.;%R\dvips//;%R\fonts\type1//`.

`OVFFONTS` Where Dvips searches for OVF files.

Standard value is `.;%R\fonts\ovf//`.

`TEXCONFIG`
Search path for Dvips configuration files (e.g. `config.ps`).

Standard value is `.;%R\dvips//`.

`TEXFONTS` Search path for `.tfm` files. This should be the same as `[TeX]Font Metric Dirs`.

`TEXINPUTS`
Search path for figure files.

Standard value is `.;%R\dvips//`.

`TEXPKS` Search path for `.pk` files. The specifiation may include the following placeholders:

`%m` The current METAFONT mode.

`%d` The horizontal resolution (in pixels per inch).

Standard value is `%R\fonts\pk\%m//dpi%d`.

`VFONTS` Search path for `.vf` (Virtual Font) files.

Standard value is `.;%R\fonts\vf//`.

5.2.13 MakeIndex related settings

The section `[MakeIndex]` contains MakeIndex related configuration settings:

`INDEXSTYLE`
: Search path (see Section 5.2.16 [Search Paths], page 20) for MakeIndex style files.

  Standard value is `.;%R\makeindex//`.

5.2.14 BibTeX related settings

The section `[BibTeX]` contains BibTeX related configuration settings:

`Input Dirs`
: Search path (see Section 5.2.16 [Search Paths], page 20 for BibTeX input files (both databases and style files).

  Standard value is `.;%R\bibtex//`.

`min_crossrefs`
: Minimum number of cross-refs required for automatic `cite_list` inclusion.

5.2.15 Configuring TeX's internal tables

The section `[Magic]` contains memory relaed configuration values. These values are used by TeX, pdfTeX and Omega for the dynamic allocation of certain data structures.

The following parameters can be changed at run time to extend or reduce TeX's capacity. They may have different values in `INITEX` and in production versions of TeX.

`mem_min` Smallest index in TeX's internal `mem` array; must be 0 or more; must be equal to `mem_bot` in `INITEX`, otherwise `<=mem_bot`.

`mem_max` Greatest index in TeX's internal `mem` array; must be strictly less than 1073741823.

`buf_size` Maximum number of characters simultaneously present in current lines of open files and in control sequences between `\csname` and `\endcsname`; must not exceed 1073741823.

`error_line`
: Width of context lines on terminal error messages.

`half_error_line`
: Width of first lines of contexts in terminal error messages; should be between 30 and (`error_line` - 15).

`max_print_line`
: Width of longest text lines output; should be at least 60.

`stack_size`
: Maximum number of simultaneous input sources.

`max_in_open`
: Maximum number of input files and error insertions that can be going on simultaneously.

`font_max` Maximum internal font number; must not exceed 5000.

`font_mem_size`
Number of words of `font_info` for all fonts.

`param_size`
Maximum number of simultaneous macro parameters.

`nest_size`
Maximum number of semantic levels simultaneously active.

`max_strings`
Maximum number of strings; must not exceed 1073741823.

`string_vacancies`
The minimum number of characters that should be available for the user's control sequences and font names, after TEX's own error messages are stored.

`pool_size`
Maximum number of characters in strings, including all error messages and help texts, and the names of all fonts and control sequences; must exceed `string_vacancies` by the total length of TEX's own strings, which is currently about 23000.

`save_size`
Space for saving values outside of current group; must be at most 1073741823.

`trie_size`
Space for hyphenation patterns; should be larger for `INITEX` than it is in production versions of TEX.

`trie_op_size`
Space for "opcodes" in the hyphenation patterns.

Like the preceding parameters, the following quantities can be changed at run time to extend or reduce TEX's capacity. But if they are changed, it is necessary to rerun the initialization program `INITEX` to generate new tables for the production TEX program. One can't simply make helter-skelter changes to the following constants, since certain rather complex initialization numbers are computed from them.

`mem_bot` Smallest index in the mem array dumped by `INITEX`; must not be less than `mem_min`.

`mem_top` Largest index in the mem array dumped by `INITEX`; must be substantially larger than 0 and not greater than `mem_max`.

5.2.16 How to specify search paths

Search paths are used by MiKTEX to find special files (such as TEX input files) within a comprehensive directory hierarchy.

A search path is a list of directory paths, which are separated by semicolons (`;`). In a directory path, the following character seqeuences have a special meaning:

`%R` A placeholder for the list of TEXMF root directories.

`//` Causes MiKTEX to search recursively.

Search paths are processed from left to right.

Example

Assuming that `c:\texmf;\\myserver\texmf` is the list of TEXMF root directories, the search path `.;%R\tex\latex//;%R\tex\generic//` causes LaTEX to search its input files in the following locations:

1. In the current directory (`.`).
2. In the directory `c:\texmf\tex\latex` and in all directories below it.
3. In the directory `\\myserver\texmf\tex\latex` and in all directories below it.
4. In the directory `c:\texmf\tex\generic` and in all directories below it
5. In the directory `\\myserver\texmf\tex\generic` and in all directories below it.

Testing a new search path

You can use the configuration utility `initexmf` to test whether an input file can be found via the current search path. For example, the command

```
initexmf --find-latex-input a4.sty
```

searches for the LaTEX input file `a4.sty`. The full pathname is printed if the file was found.

6 Configuration Utility

`initexmf.exe` is the MiKTEX configuration utility. You use `initexmf.exe` to

- define the list of TEXMF root directories
- update the filename database
- update various memory files (`plain.fmt` and friends)
- define the name/location of a personal configuration file

6.1 Defining TEXMF Root Directories

MiKTEX allows you to use several TEXMF directory trees. You define these directories by using the command line switch `--root-directories`. This switch takes as argument a semicolon-separated list of root directory names:

`initexmf --root-directories` *TEXMF1*`;`*TEXMF2*`;...`

The most common use is the incorporation of an existing TEXMF tree. This tree might be located on a CD-ROM or on a remote network drive.

Example: you have installed MiKTEX locally on you workstation and you know, that your system administrator has exported a comprehensive TEXMF directory tree. The local TEXMF tree is rooted at `c:\texmf`. The share name of the remote TEXMF tree is `\\server\texmf`. You then would start `initexmf.exe` in this way:

```
initexmf --root-directories c:\texmf;\\server\texmf
```

It probably is a good idea to build a complete filename-database once you have defined several TEXMF roots (see Section 6.2 [fndb], page 22).

6.1.1 Defining the local TEXMF tree

When MiKTEX creates new fonts and the like, then it installs the new files in the so called *Local TEXMF Tree*. By default, this is the first tree that was specified after '`--root-directories`'. You can override the default by using the option '`--local-root`'. For example, the following invocation of `initexmf` will define two TEXMF trees of which the second shall be the local one:

```
initexmf --root-directories c:\texmf;c:\ltexmf --local-root c:\ltexmf
```

6.2 Maintaining the filename database

To speed up file search, MiKTEX makes use of a list of known file names. This list is called the filename database (fndb). The fndb is spread over several fndb files, one for each TEXMF root directory.

The fndb file for the first TEXMF tree is called `texmf0.fndb`. For the second tree it is called `texmf1.fndb`. And so on.

It is strongly recommended that you update the fndb whenever files are added to or removed from one of the TEXMF trees.

You update all fndb files by invoking `initexmf.exe` with the command line switch `--update-fndb`:

```
initexmf --update-fndb
```

You can update a certain fndb file by specifying the TEXMF root. For example,

```
initexmf --update-fndb=c:\texmf
```

will update the fndb file for the tree rooted at `c:\texmf`.

6.3 Maintaining the PostScript resource database

The PostScript resource database (PSres) is used by some utilities in order to locate PostScript resources (font outlines/metrics/encodings).

The database is located in the MiKTEX config directory (usually '`c:\texmf\config`'). The name of the database file is '`dpres.dpr`'. It is a text file, so you can view it with a text editor (e.g. wordpad).

It is strongly recommended that you update the database whenever PostScript resources ('`*.pfb;*.afm;*.enc`') are added to or removed from one of the TEXMF trees.

You update the database files by invoking `initexmf.exe` with the command line switch `--mkpsres`:

```
initexmf --mkpsres
```

6.3.1 Incorporating External Font Directories

It is possible to add non-MiKTEX font directories to the resource database. The `--mkpsres` switch accepts as an optional argument the name of an external font directory. You can use several `--mkpsres` switches with on invocation of `initexmf`.

By specifying the command line flag `--search`, you can cause `initexmf` to automatically search your workstation for third party PS resource files (e.g. Acrobat Reader Fonts):

```
initexmf --mkpsres --search
```

6.4 Making Format Files

Some programs initialize itself by reading parts of the memory from an external file. For the TEX family of programs, such a file is called a *Format File*.

You create new format files by invoking `initexmf` with the command line switch `--dump`. This switch takes an optional argument, which is the name of the program for which a new format file is to be created:

```
initexmf --dump[=program]
```

If *program* is ommited, then all format files will be rebuilt. Otherwise, *program* must be one of the following names:

`tex` This creates the format file `plain.fmt` which is used by `tex.exe`.

`latex` This creates the format file `latex.fmt` which is used by `latex.exe`.

`pdftex` This creates the format file `pdftex.fmt` which is used by `pdftex.exe`.

`pdflatex` This creates the format file `pdflatex.fmt` which is used by `pdflatex.exe`.

`metafont` This creates the format file `plain.base` which is used by `mf.exe` (METAFONT).

`metapost` This creates the format file `plain.mem` which is used by `mpost.exe` (MetaPost).

`omega` This creates the format file `omega.fmt` which is used by `omega.exe`.

`lambda` This creates the format file `lambda.fmt` which is used by `lambda.exe`.

6.4.1 Controlling which hyphenation patterns are used by LaTeX

You can control the loading of hyphenation patterns by modifying the file `language.dat`, which is located in the directory `tex\generic\hyphen\local` relative to the TEXMF root directory.

As distributed with MiKTeX, `language.dat` has the following contents:

```
% File    : language.dat
% Purpose : specify which hypenation patterns to load
%           while running iniTeX
english ushyphen.tex
%ukenglish ukhyphen.tex
german ghyph31.tex
%italian ithyph.tex
%dutch nehyph2.tex
%finnish fihyph.tex
%norwegian nohyph.tex
%french f8hyph.tex
```

Lines starting with `%` are comments. The only uncommented lines in the example are `english ushyphen.tex` and `german ghyph31.tex`. That is, only hyphenation patterns for U.S. English and German will be loaded by TeX. To load other hyphenation patterns, you have to uncomment the corresponding lines.

After modifying `language.dat`, you have to create new LaTeX format files (see Section 6.4 [Format Files], page 23).

6.5 Personal Configuration Files

You can cause MiKTeX to read a personal configuration file (in addition to the global one) by using the command line switch `--personal`:

```
initexmf --personal[=FILENAME]
```

If specified, *FILENAME* must be the name of an existing configuration file. If *FILENAME* is ommitted, then MiKTeX will not use a personal configuration file.

Values read from *FILENAME* will override those values that were read from the global configuration file.

For example, consider the case that you have some private LaTeX style files in you home directory (say `c:\users\me`). You could write a private configuration file (say `miktex.ini`) and place it in your home directory. The configuration file should look like this:

```
[LaTeX]
Input Dirs=.;c:\users\me//;%R\tex\latex//;%R\tex\generic//
```

Then you had to announce the configuration file this way:

```
initexmf --personal=c:\users\me\miktex.ini
```

6.6 Configure Options

Here is a summary of all `initexmf.exe` command line switches:

`--dump` Refresh all memory files (`*.fmt *.base *.mem`).

`--dump=`*program*
: Remake all memory files (`*.fmt *.base *.mem`) related to a specific compiler. *program* must be one of: `lambda`, `latex`, `metafont`, `metapost`, `omega`, `pdflatex`, `pdftex`, `tex`.

`--find-lambda-input` *FILE*
: Find Lambda input file.

`--find-latex-input` *FILE*
: Find LaTeX input file.

`"--find-metafont-input` *FILE*
: Find METAFONT input file.

`--find-metapost-input` *FILE*
: Find MetaPost input file.

`--find-omega-input` *FILE*
: Find Omega input file.

`--find-pdflatex-input` *FILE*
: Find pdfLaTeX input file.

`--find-pdftex-input` *FILE*
: Find pdfTeX input file.

`--find-tex-input` *FILE*
: Find TeX input file.

`--local-root` *root*
: Specify the local TEXMF root.

`--mkpsres`
: Update the PostScript resource database '`psres.dpr`'. You can use this option in conjunction with `--search` (see below).

`--mkpsres='dir'`
: Add a new font directory to the PostScript resource database '`psres.dpr`'.

`--personal`

`-p` Do not use a personal configuration file.

`--personal=`*FILENAME*
`-p`*FILENAME*
: Define the location of the personal configuration file.

`--print-only`
`-n`
: Print what would be done. Nothing is changed.

`--report`
: Create a configuration report.

`--root-directories` *dirlist*
`-r` *dirlist*
: Specify the list of TEXMF root directories.

`--search`
: Search for PS resource files (requires `--mkpsres`).

`--update-fndb`
`-u`
: Refresh the whole filename database.

`--update-fndb=`*root*
`-u`*root*
: Refresh the filename database for a specific TEXMF root.

`--verbose`
`-v`
: Print information on what is being done.

`--version`
`-V`
: Print the version number and exit.

7 Configuring Dvips

As distributed with MiKTEX, Dvips is configured as follows:

- When generating fonts, Dvips uses METAFONT mode `ljfour` (HP Laserjet 4).
- Horizontal resolution is 600 dpi.
- Paper size is A4.
- Dvips does not make use of the CM & AMS PostScript fonts.

You probably have to change some of theses settings for your site. To do so, open the Dvips configuration file `c:\texmf\dvips\config\local\config.ps` with your favourite text editor.

The line starting with `M` specifies the METAFONT mode which Dvips uses for the generation of new raster fonts. Enter a suitable mode here. If you don't know the mode for your output device, then take a look at `metafont\misc\modes.mf`. This file contains an annotated list of METAFONT modes.

The line starting with `D` specifies the resolution. Enter a value that matches your printer.

See the Dvips manual, for more information about configuring Dvips.

8 Manual Pages

In this chapter you will find basic information for some of the programs.

8.1 Running the document compilers

8.1.1 How to run TEX

The usual way to start TEX is as follows:

`tex` *options* *firstinputline*

firstinputline, if supplied, specifies the first input line. This is usually the name of an input file.

For example, the command

```
tex hello.tex
```

causes TEX to produce the DVI file `hello.dvi` from the input file `hello.tex`. You can specify the input file without the `.tex` extension:

```
tex hello
```

You must specify the `.tex` extension if the filename contains more than one dot (`.`). For example, it does not work to say

```
tex foo.bar
```

You have to say

```
tex foo.bar.tex.
```

instead.

Please note: you cannot specify file names that contain space characters, even if the file system allows such names.

Command line switches

Besides the common switches (see Section 8.1.7 [Common Options], page 31), TEX supports these command line switches:

`--font-max=`*n*
: Sets the internal `font_max` to *n*. `font_max` is the maximum internal font number; must not exceed 5000.

Aliases

`initex` Equivalent to `tex --ini`.

`virtex` Equivalent to `tex`.

`latex` Equivalent to `tex "&latex"`.

`bigtex` Equivalent to `tex --mem-max=6000000`.

`hugetex` Equivalent to `tex --mem-max=20000000`.

`biglatex` Equivalent to `tex "&latex" --mem-max=6000000`.

`hugelatex`
Equivalent to `tex "&latex" --mem-max=20000000`.

8.1.2 How to run LaTeX

To run LaTeX, you must run TeX (see Section 8.1.1 [Running TeX], page 28) with an instruction to load the LaTeX format file `latex.fmt`.

For example, you would type

```
tex "&latex" mydoc
```

to process the input file `mydoc.tex`.

For your convenience, there exists an alias named `latex.exe`:

```
latex mydoc
```

is equivalent to the first example.

8.1.3 How to run pdfTeX

The usual way to start pdfTeX is as follows:

`pdftex` *options firstinputline*

firstinputline, if supplied, specifies the first input line. This is usually the name of an input file.

For example, the command

```
pdftex hello.tex
```

causes pdfTeX to produce the PDF file `hello.pdf` from the input file `hello.tex`. You can specify the input file without the `.tex` extension:

```
pdftex hello
```

You must specify the `.tex` extension if the filename contains more than one dot (`.`). For example, it does not work to say

```
pdftex foo.bar
```

You have to say

```
pdftex foo.bar.tex.
```

instead.

Please note: you cannot specify file names that contain space characters, even if the file system allows such names.

Command Line Switches

Besides the common switches (see Section 8.1.7 [Common Options], page 31), pdfTeX supports these command line switches:

`--font-max=`*n*
Sets the internal `font_max` to *n*. `font_max` is the maximum internal font number; must not exceed 5000.

Aliases

`inipdftex`
: Equivalent to `pdftex --ini`.

`virpdftex`
: Equivalent to `pdftex`.

`pdflatex` Equivalent to `pdftex "&pdflatex"`.

8.1.4 How to run pdfLaTeX

To run pdfLaTeX, you must run pdfTeX (see Section 8.1.3 [pdfTeX], page 29) with an instruction to load the pdfLaTeX format file `pdflatex.fmt`.

For example, you would type

```
pdftex "&pdflatex" mydoc
```

to process the input file `mydoc.tex`.

For your convenience, there exists an alias named `pdflatex.exe`:

```
pdflatex mydoc
```

is equivalent to the first example.

8.1.5 How to run Omega

The usual way to start Omega is as follows:

```
omega options firstinputline
```

firstinputline, if supplied, specifies the first input line. This is usually the name of an input file.

For example, the command

```
omega hello.tex
```

causes Omega to produce the DVI file `hello.dvi` from the input file `hello.tex`. You can specify the input file without the `.tex` extension:

```
omega hello
```

You must specify the `.tex` extension if the filename contains more than one dot (`.`). For example, it does not work to say

```
omega foo.bar
```

You have to say

```
omega foo.bar.tex.
```

instead.

Please note: you cannot specify file names that contain space characters, even if the file system allows such names.

Command Line Switches

Omega supports the common switches (see Section 8.1.7 [Common Options], page 31).

Aliases

`iniomega` Equivalent to `omega --ini`.

`viromega` Equivalent to `omega`.

`lambda` Equivalent to `omega "&lambda"`.

8.1.6 How to run Lambda

To run Lambda, you must run Omega (see Section 8.1.5 [Omega], page 30) with an instruction to load the Lambda format file `lambda.fmt`.

For example, you would type

```
omega "&lambda" mydoc
```

to process the input file `mydoc.tex`.

For your convenience, there exists an alias named `lambda.exe`:

```
lambda mydoc
```

is equivalent to the first example.

8.1.7 Common Command Line Switches

The following command line switches are commonly supported by TEX, pdfTEX and Omega:

`--buf-size=`*n*
: Set the internal `buf_size` to *n*. `buf_size` is the maximum number of characters simultaneously present in current lines of open files and in control sequences between `\csname` and `\endcsname`; must not exceed 1073741823.

`--c-style-errors`
: Show C/C++ style error messages. This switch implies `\scrollmode`.

`--error-line=`*n*
: Set the internal `error_line` to *n*. `error_line` us the width of context lines on terminal error messages.

`--half-error-line=`*n*
: Set the internal `half_error_line` to *n*. `half_error_line` is the width of first lines of contexts in terminal error messages; should be between 30 and (`error_line` - 15).

`--initialize`
: Initialize internal tables; these tables can be `\dump`ed to a format file.

`--help` Show a help screen and exit.

`--max-in-open=`*n*
: Set the internal `max_in_open` to *n*. `max_in_open` is the maximum number of input files and error insertions that can be going on simultaneously.

`--max-print-line=`*n*
: Set the internal `max-print-line` to *n*. `max-print-line` is the width of longest text lines output; should be at least 60.

`--max-strings=`*n*
: Set the internal `max_strings` to *n*. `max_strings` is the maximum number of strings; must not exceed 1073741823.

`--mem-bot=`*n*
: Set the internal `mem_bot` to *n*. `mem_bot` is the smallest index in the `code` array dumped by `INITEX` (`INIOMEGA`, `INIPDFTEX`); must not be less than `mem_min`.

`--mem-max=`*n*
: Set the internal `mem_max` to *n*. `mem_max` is the greatest index in the internal `mem` array; must be strictly less than 1073741823.

`--mem-min=`*n*
: Set the internal `mem_min` to *n*. `mem_min` is the smallest index in the internal `mem` array; must be 0 or more; must be equal to `mem_bot` in `INITEX` (`INIOMEGA`, `INIPDFTEX`), otherwise <= `mem_bot`.

`--mem-top=`*n*
: Set the internal `mem_top` to *n*. `mem_top` is the largest index in the `mem` array dumped by `INITEX` (`INIOMEGA`, `INIPDFTEX`); must be substantially larger than 0 and not greater than `mem_max`.

`--nest-size=`*n*
: Set the internal `nest_size` to *n*. `nest_size` is the maximum number of semantic levels simultaneously active.

`--param-size=`*n*
: Set the internal `param_size` to *n*. `param_size` is the maximum number of simultaneous macro parameters.

`--pool-size=`*n*
: Set the internal `pool-size` to *n*. `pool_size` is the maximum number of characters in strings, including all error messages and help texts, and the names of all fonts and control sequences; must exceed `string_vacancies` by the total length of the program's own strings, which is currently about 30000.

`--save-size=`*n*
: Set the internal `save_size` to *n*. `save_size` is the amount of space for saving values outside of current group; must be at most 1073741823.

`--stack-size=`*n*
: Set the internal `stack_size` to *n*. `stack_size` is the maximum number of simultaneous input sources.

`--string-vacancies=`*n*
: Set the internal `string_vacancies` to *n*. `string_vacancies` is the minimum number of characters that should be available for the user's control sequences and font names, after the program's own error messages are stored.

`--trie-size=`*n*
: Set the internal `trie_size` to *n*. `trie_size` is the amount of space for hyphenation patterns; should be larger for `INITEX` (`INIOMEGA`, `INIPDFTEX`) than it is in production versions of the program.

`--trie-op-size=`*n*
: Set the internal `trie_op_size` to *n*. `trie_op_size` is the amount of space for "opcodes" in the hyphenation patterns.

`--version`
: Print version information and exit.

8.2 Running MetaPost

The general command line syntax is

`mp [`*OPTION*`...] [`*filename*`]`

Options

`--initialize`
: Initializes MetaPost's internal tables so that they can be dumped.

`--help` Shows a short help screen and exits.

`--tex=`*texprogram*
: Uses *texprogram* instead of `tex` when compiling text labels. This flag overrides the environment variable `TEX`.

`--version`
: Prints version information and exits.

Aliases

The following aliases are available

`mpost` Equivalent to `mp`.

`virmp` Equivalent to `mp`.

`inimp` Equivalent to `mp --ini`.

8.3 dvips

[This following paragraph is borrowed from the dvips manual.]

The program dvips takes a DVI file produced by TEX (or by some other processor such as GFtoDVI) and converts it to PostScript, normally sending the result directly to the laserprinter. The DVI file may be specified without the `.dvi` extension. Fonts used may either be resident in the printer or defined as bitmaps in PK files, or a 'virtual' combination of both. dvips will automatically invoke METAFONT to generate fonts that don't already exist.

For more information, see the manual `dvips.dvi` in the `doc\dvips` directory.

8.3.1 Command line options

[This section is borrowed from the dvips manual.]

The usual way to start dvips is as follows

`dvips` *options dvifile*

dvifile may be specified without the `.dvi` extension.

Options

`-a` Conserve memory by making three passes over the `.dvi` file instead of two and only loading those characters actually used. Generally only useful on machines with a very limited amount of memory, like some PCs.

`-A` Print only odd pages (TEX pages, not sequence pages).

`-b` *num* Generate *num* copies of each page, but duplicating the page body rather than using the *#numcopies* option. This can be useful in conjunction with a header file setting *char92bop-hook* to do color separations or other neat tricks.

`-B` Print only even pages (TEX pages, not sequence pages).

`-c` *num* Generate *num* copies of every page. Default is 1. (For collated copies, see the `-C` option below.)

`-C` *num* Create *num* copies, but collated (by replicating the data in the PostScript file). Slower than the `-c` option, but easier on the hands, and faster than resubmitting the same PostScript file multiple times.

`-D` *num* Set the resolution in dpi (dots per inch) to *num*. This affects the choice of bitmap fonts that are loaded and also the positioning of letters in resident PostScript fonts. Must be between 10 and 10000. This affects both the horizontal and vertical resolution. If a high resolution (something greater than 400 dpi, say) is selected, the `-Z` flag should probably also be used.

`-e` *num* Make sure that each character is placed at most this many pixels from its 'true' resolution-independent position on the page. The default value of this parameter is resolution dependent. Allowing individual characters to 'drift' from their correctly rounded positions by a few pixels, while regaining the true position at the beginning of each new word, improves the spacing of letters in words.

`-E` Makes dvips attempt to generate an EPSF file with a tight bounding box. This only works on one-page files, and it only looks at marks made by characters and rules, not by any included graphics. In addition, it gets the glyph metrics from the *tfm* file, so characters that lie outside their enclosing *tfm* box may confuse it. In addition, the bounding box might be a bit too loose if the character glyph has significant left or right side bearings. Nonetheless, this option works well for creating small EPSF files for equations or tables or the like. (Note, of course, that dvips output is resolution dependent and thus does not make very good EPSF files, especially if the images are to be scaled; use these EPSF files with a great deal of care.)

`-f` Read the `.dvi` file from standard input and write the PostScript to standard output. The standard input must be seekable, so it cannot be a pipe. If you must use a pipe, write a shell script that copies the pipe output to a temporary file and then points dvips at this file. This option also disables the automatic reading of the `PRINTER` environment variable, and turns off the automatic sending of control D if it was turned on with the `-F` option or in the configuration file; use `-F` after this option if you want both.

`-h` *name* Prepend file *name* as an additional header file. (However, if the name is simply `-` suppress all header files from the output.) This header file gets added to the PostScript 'userdict'.

`-i` Make each section be a separate file. Under certain circumstances, dvips will split the document up into 'sections' to be processed independently; this is most often done for memory reasons. Using this option tells dvips to place each section into a separate file; the new file names are created replacing the suffix of the supplied output file name by a three-digit sequence number. This option is most often used in conjunction with the `-S` option which sets the maximum section length in pages. For instance, some phototypesetters cannot print more than ten or so consecutive pages before running out of steam; these options can be used to automatically split a book into ten-page sections, each to its own file.

`-k` Print crop marks. This option increases the paper size (which should be specified, either with a paper size special or with the `-T` option) by a half inch in each dimension. It translates each page by a quarter inch and draws cross-style crop marks. It is mostly useful with typesetters that can set the page size automatically.

`-K` This option causes comments in included PostScript graphics, font files, and headers to be removed. This is sometimes necessary to get around bugs in spoolers or PostScript post-processing programs. Specifically, the `%%Page` comments, when left in, often cause difficulties. Use of this flag can cause some included graphics to fail, since the PostScript header macros from some software packages read portions of the input stream line by line, searching for a particular comment. This option has been turned off by default because PostScript previewers and spoolers have been getting better.

`-l` *num* The last page printed will be the first one numbered *num* Default is the last page in the document. If the *num* is prefixed by an equals sign, then it (and any argument to the `-p` option) is treated as a sequence number, rather than a value to compare with *char92 count0* values. Thus, using `-l =9` will end with the ninth page of the document, no matter what the pages are actually numbered.

`-m` Specify manual feed for printer.

`-M` Turns off the automatic font generation facility. If any fonts are missing, commands to generate the fonts are appended to the file `missfont.log` in the current directory; this file can then be executed and deleted to create the missing fonts.

`-n` *num* At most *num* pages will be printed. Default is 100000.

`-N` Turns off structured comments; this might be necessary on some systems that try to interpret PostScript comments in weird ways, or on some PostScript printers. Old versions of TranScript in particular cannot handle modern Encapsulated PostScript.

`-o` *name* The output will be sent to file *name* If no file name is given, the default name is `file.ps` where the `.dvi` file was called `file.dvi`; if this option isn't given, any default in the configuration file is used. If the first character of the supplied output file name is an exclamation mark, then the remainder will be used as an argument to `popen`; thus, specifying `!lpr` as the output file will automatically queue the file for printing. This option also disables the automatic reading of the `PRINTER` environment variable, and turns off the automatic sending of control D if it was turned on with the `-F` option or in the configuration file; use `-F` after this option if you want both.

`-O` *offset* Move the origin by a certain amount. The *offset* is a comma-separated pair of dimensions, such as `.1in,-.3cm` (in the same syntax used in the `papersize` special). The origin of the page is shifted from the default position (of one inch down, one inch to the right from the upper left corner of the paper) by this amount.

`-p` *num* The first page printed will be the first one numbered *num*. Default is the first page in the document. If the *num* is prefixed by an equals sign, then it (and any argument to the `-l` option) is treated as a sequence number, rather than a value to compare with *char92 count0* values. Thus, using `-p =3` will start with the third page of the document, no matter what the pages are actually numbered.

`-pp` *pagelist*
A comma-separated list of pages and ranges (a-b) may be given, which will be interpreted as *char92 count0* values. Pages not specified will not be printed. Multiple `-pp` options may be specified or all pages and page ranges can be specified with one `-pp` option.

`-P` *printername*
Sets up the output for the appropriate printer. This is implemented by reading in `config.printername`, which can then set the output pipe (as in, `!lpr -Pprintername` as well as the font paths and any other `config.ps` defaults for that printer only. Note that `config.ps` is read before `config.printername` In addition, another file called `~/.dvipsrc` is searched for immediately after `config.ps`; this file is intended for user defaults. If no `-P` command is given, the environment variable `PRINTER` is checked. If that variable exists, and a corresponding configuration file exists, that configuration file is read in.

`-q` Run in quiet mode. Don't chatter about pages converted, etc.; report nothing but errors to standard error.

`-r` Stack pages in reverse order. Normally, page 1 will be printed first.

`-s` Causes the entire global output to be enclosed in a save/restore pair. This causes the file to not be truly conformant, and is thus not recommended, but is useful if you are driving the printer directly and don't care too much about the portability of the output.

`-S` *num* Set the maximum number of pages in each 'section'. This option is most commonly used with the `-i` option; see that documentation above for more information.

`-t` *papertype*
This sets the paper type to *papertype*. The *papertype* should be defined in one of the configuration files, along with the appropriate code to select it. (Currently known types include `letter`, `legal`, `ledger`, `a4`, `a3`). You can also specify `-t landscape`, which rotates a document by 90 degrees. To rotate a document whose size is not letter, you can use the `-t` option twice, once for the page size, and once for landscape. The upper left corner of each page in the `.dvi` file is placed one inch from the left and one inch from the top. Use of this option is highly dependent on the configuration file. Note that executing the `letter` or `a4` or other PostScript operators cause the document to be nonconforming and can cause it not to print on certain printers, so the paper size should not execute such an operator if at all possible.

`-T offset` Set the paper size to the given pair of dimensions. This option takes its arguments in the same style as `-O`. It overrides any paper size special in the dvi file.

`-U` Disable a PostScript virtual memory saving optimization that stores the character metric information in the same string that is used to store the bitmap information. This is only necessary when driving the Xerox 4045 PostScript interpreter. It is caused by a bug in that interpreter that results in 'garbage' on the bottom of each character. Not recommended unless you must drive this printer.

`-x` *num* Set the magnification ratio to *num*/1000. Overrides the magnification specified in the `.dvi` file. Must be between 10 and 100000.

`-X` *num* Set the horizontal resolution in dots per inch to *num*.

`-Y` *num* Set the vertical resolution in dots per inch to *num*.

`-Z` Causes bitmapped fonts to be compressed before they are downloaded, thereby reducing the size of the PostScript font-downloading information. Especially useful at high resolutions or when very large fonts are used. Will slow down printing somewhat, especially on early 68000-based PostScript printers.

8.4 MakeIndex

MakeIndex is a program for making an index in a document generated with LaTeX. See `doc\makeindex\makeindex.dvi` for more information.

8.4.1 MakeIndex command line options

[This section is borrowed from the MakeIndex manual.]

The usual way to invoke MakeIndex is as follows:

`makeindex` *options* `[`*idx0 idx1 idx2*`...]`

Options

`-c` Compress intermediate blanks (ignoring leading and trailing blanks and tabs). By default, blanks in the index key are retained.

`-g` Employ German word ordering in the index, in accord with rules set forth in DIN 5007. By default, makeindex employs a word ordering in which precedence is: symbols, numbers, uppercase letters, lowercase letters. The sequence in German word ordering is: symbols, lowercase letters, uppercase letters, numbers. Addition- ally, this option enables makeindex to recognize the German TeX-commands `{"`a, `"`o, `"`u and `"`s`}` as {ae, oe, ue and ss} during the sorting of the entries. The quote character must be redefined in a style file (for example, redefine quote as '+'). If the quote character is not redefined, makeindex will produce an error message and abort.

`-i` Take input from stdin. When this option is specified and `-o` is not, output is written to stdout.

`-l` Letter ordering; by default, word ordering is used (see the ORDERING section).

`-o` *ind* Employ *ind* as the output index file. By default, the file name is created by appending the extension `.ind` to the base name of the first input file (idx0).

`-p` *num* Set the starting page number of the output index file to be *num* (useful when the index file is to be formatted separately). The argument *num* may be numerical or one of the following:

- `any` The starting page is the last source page number plus 1.
- `odd` The starting page is the first odd page following the last source page number.
- `even` The starting page is the first even page following the last source page number.

The last source page is obtained by searching backward in the log file for the first instance of a number included within paired square brackets ([...]). If a page number is missing or the log file is not found, no attempt will be made to set the starting page number. The source log file name is determined by appending the extension `.log` to the base name of the first input file (idx0).

`-q` Quiet mode; send no messages to stderr. By default, progress and error messages are sent to stderr as well as to the transcript file.

`-r` Disable implicit page range formation; page ranges must be created by using explicit range operators; see SPECIAL EFFECTS below. By default, three or more successive pages are automatically abbreviated as a range (e.g. 1-5).

`-s sty` Employ *sty* as the style file (no default). The environment variable `INDEXSTYLE` defines the path where the style file should be found.

`-t` *log* Employ log as the transcript file. By default, the file name is created by appending the extension `.ilg` to the base name of the first input file (idx0).

8.5 BibTEX

You use BibTEX in conjunction with LaTEX to compose bibliographies. MiKTEX comes with two BibTEX implementations: an 'traditional' BibTEX 0.99c implementation called `bibtex.exe` and an 8-bit-enhanced implementation called `bibtex8.exe`. I recommend using the enhanced version since it has a larger processing capacity.

Documentation for the enhanced BibTEX is in `c:\texmf\doc\bibtex8`.

8.5.1 How to run BibTeX

The usual way to start the traditional BibTEX is as follows:

`bibtex` *inputfilename*

inputfilename must be specified without the extension.

8.5.2 BibTEX databases and style files

`.bst` (BibTEX style files) are located in the directory `c:\texmf\bibtex\bst`.

`.bib` (BibTEX databases) are located in the directory `c:\texmf\bibtex\bib`.

8.6 Previewing with YAP

YAP is a DVI previewer, i.e. it allows you to view your TEXed documents before you send them to the printer.

The usual way to start YAP is as follows:

`yap` *document*`.dvi`

This opens the file *document*`.dvi` and displays its first page.

See the YAP User's Manual ('`yap.dvi`') for more information.

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