MiKTEX 2.4 Manual

Revision 2.4.1779

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About this Document

This is version 2.4.1779 of the MiKTEX manual. It corresponds to MiKTEX 2.4 as of November 14, 2004.

The latest version of this document is available on the *MiKTEX Download Page*[1] <http://sourceforge.net/project/showfiles.php?group_id=10783> in various formats.

[1] <http://sourceforge.net/project/showfiles.php?group_id=10783>

Contents

Chapter 1

Introduction

1.1 About this Manual

This manual is about MiKTEX: the purpose of this manual is not to give an introduction into the world of TEX. If you are not familiar with using TEX (and Friends), then please consider reading one of the tutorials available on the Internet[1] <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=tutorials>.

1.2 About MiKTEX

MiKTEX (pronounced *mik-tech*) is an up-to-date implementation of TEX and related programs for Windows (all current variants). TEX is a typesetting system invented by D. E. Knuth.

MiKTEX's main features include:

- easy to install: MiKTEX comes with a setup program that allows you to install the distribution via the Internet
- integrated package management: missing packages can be installed automatically (on-the-fly) during run-time
- network friendly: MiKTEX can be run directly from a shared and read-only network directory
- complete: the MiKTEX distribution contains almost all packages that are freely redistributable.
- enhanced TEX compiler capabilities
- enhanced previewer capabilities: forward/inverse DVI search, graphics, color, magnifying glass, ...
- open source: MiKTEX source code is get-at-able for everyone

The MiKTEX distribution consists of the following components:

TEX, METAFONT**, TEXware,** METAFONT**ware, Computer Modern Fonts**
: the base TEX system

pdfTEX, ε**-TEX, pdf-**ε**-TEX,** Ω**,** ε**-**Ω**,** $\mathcal{NTS}$
: various TEX derivatives

METAPOST
: a METAFONT derivative for the creation of PostScript figures

Dvipdfm
: converts TEX output into PDF documents

macro packages
: almost all free TEX macro packages

[1] <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=tutorials>

fonts
almost all free fonts

Yap a sophisticated viewer for TEX output

TEXify
a TEX compiler driver

MiKTEX Options
assists in configuring MiKTEX

MiKTEX Update Wizard
assists in keeping the MiKTEX system up-to-date

lots of utilities
tools for the creation of bibliographies & indexes, PostScript utilities, and more

1.3 How to Get MiKTEX

MiKTEX is available on the CTAN[2] and on CD-R.

1.3.1 Downloading from the CTAN

You can download MiKTEX from the CTAN with the help of MiKTEX Setup Wizard (see Section 2.1.3).

1.3.2 MiKTEX on CD-R

If you cannot easily download more than 250 MB (the complete MiKTEX distribution), then you may wish to obtain a copy of the MiKTEX CD-R. Visit the CD-R info page[3] <http://www.miktex.org/cd/>, for more information.

The MiKTEX CD-R allows you to install MiKTEX on the hard-disk or to run the programs directly from the CD-R.

1.3.3 Related Applications

There are other applications you might be interested in installing:

ActivePerl
ActivePerl[4] <http://www.activestate.com> is an implementation of Perl for Windows. A few utilities (e.g., ConTEXt) are Perl scripts. You should install ActivePerl, if you want to use these utilities.

Adobe Acrobat Reader
Adobe Acrobat Reader[5] <http://www.adobe.com/prodindex/acrobat/readstep.html> is a PDF document viewer.

DebugView
DebugView is a freeware application that lets you monitor diagnostic messages produced by MiKTEX. You can download DebugView from the Sysinternals web site[6] <http://www.sysinternals.com>.

[2] Comprehenisive TeX Archive Network
[3] <http://www.miktex.org/cd/>
[4] <http://www.activestate.com>
[5] <http://www.adobe.com/prodindex/acrobat/readstep.html>
[6] <http://www.sysinternals.com>

TEXnicCenter
TEXnicCenter[7] <http://www.toolscenter.org> is a freeware TEX editor/shell. It cooperates with MiKTEX with respect to forward and inverse DVI search (see Section 4.2.5).

WinEdt
WinEdt[8] <http://www.winedt.com> is a shareware TEX editor/shell. It cooperates with MiKTEX with respect to forward and inverse DVI search (see Section 4.2.5).

1.4 Registration

If you enjoy MiKTEX and want to support the project, then please consider registering MiKTEX. Visit the MiKTEX donations page[9] <http://www.miktex.org/donations.html>, for more information.

Registered MiKTEX users are entitled to email support.

1.5 The MiKTEX Project Page

The MiKTEX Project Page[10] <http://www.miktex.org> is the address to turn to for MiKTEX related news & information.

1.6 The MiKTEX Mailing List

There is a discussion list for MiKTEX users. You can join this list by visiting the MiKTeX-Users Info Page[11] <http://lists.sourceforge.net/lists/listinfo/miktex-users> and filling out the form provided there.

To see the collection of prior postings to the mailing list, browse the MiKTeX-Users Archives[12] <http://www.geocrawler.com/redir-sf.php3?list=miktex-users>.

1.7 Documentation

Other MiKTEX related documentation includes:

FAQ Answers to frequently asked questions.

Tips & Tricks
Some good advice for MiKTEX users.

Shortcuts to these documents can be found in the MiKTEX program folder (see Section 2.3) and on the project page.

[7] <http://www.toolscenter.org>
[8] <http://www.winedt.com>
[9] <http://www.miktex.org/donations.html>
[10] <http://www.miktex.org>
[11] <http://lists.sourceforge.net/lists/listinfo/miktex-users>
[12] <http://www.geocrawler.com/redir-sf.php3?list=miktex-users>

TIP

Use the **texdoc** utility to quickly access TEX related documentation. For example, enter

```
texdoc yap
```

to view the Yap manual.

Chapter 2

Installing MiKTEX

2.1 Installation Instructions

2.1.1 Prerequisites

MiKTEX runs on all current Windows platforms.

MiKTEX Setup Wizard does not install any operating system components (such as `comctl32.dll`). It is taken for granted, that all required system components exist, either because they are a part of the operating system, or because they were installed by an operating system update (service pack).

The following system components are required by MiKTEX:

`comctl32.dll`
: Version 5.80.2614.3600 (or later) of the Common Controls DLL must be installed. This is the case if the operating system is Windows Me or Windows XP. For older operating systems, it might be necessary to get the DLL from Microsoft[1] <http://www.microsoft.com/downloads/release.asp?releaseid=30318>.

`wininet.dll`
: Version 4.70.0.1300 (or later) of the Internet Extensions DLL must be installed. It is a part of Internet Explorer 4.0 (or later).

MiKTEX Setup Wizard displays a message and quits, if one of the required system components is missing.

2.1.2 Choosing a Package Set

If you install MiKTEX on your hard-disk, you can choose between three package sets: “Small MiKTEX”, “Large MiKTEX” and “Total MiKTEX”.

“Small MiKTEX”
: This is a basic MiKTEX system which gets you started.

“Large MiKTEX”
: This gives you the most important macro packages and fonts.

“Total MiKTEX”
: This includes all available packages.

Choose “Small MiKTEX”, if you are downloading MiKTEX over a slow Internet connection or if you want to conserve disk space. It is possible to configure MiKTEX in such a a way, that missing packages are automatically installed later (in the course of use).

[1] <http://www.microsoft.com/downloads/release.asp?releaseid=30318>

2.1.3 Downloading MiKTEX

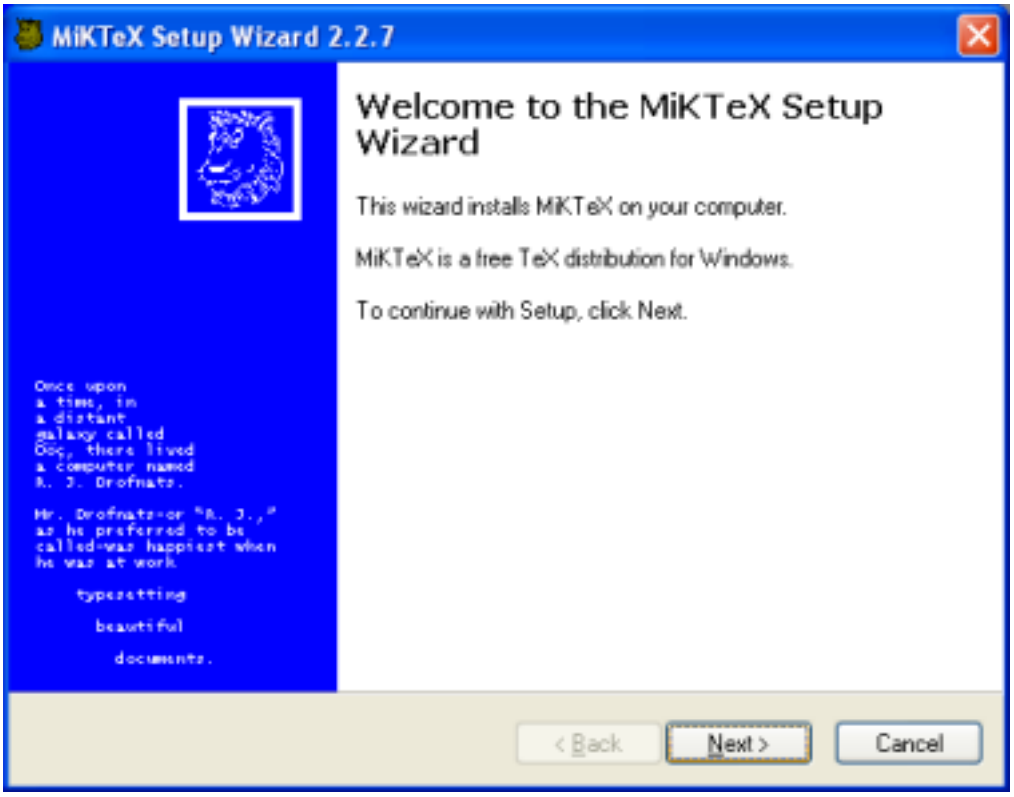
TIP

The small package set and the setup program have been packed together into the "Small MiKTEX Installer" (available on the SourceForge.net download server[a] <http://sourceforge.net/project/showfiles.php?group_id=10783>). It is recommended that you download this installer, if you intend to install the small package set. In this case you can skip the rest of this section.

[a] <http://sourceforge.net/project/showfiles.php?group_id=10783>

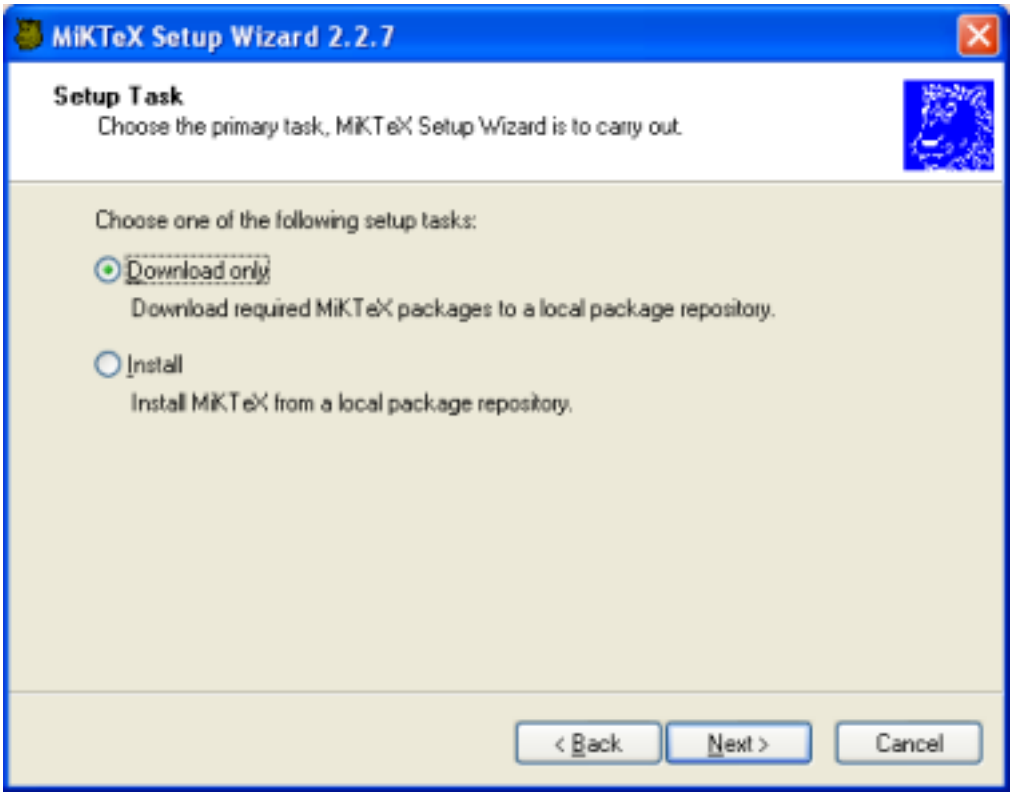
You can download MiKTEX either with the help of MiKTeX Setup Wizard (`setup.exe`), or manually with the help of an FTP client. This installation guide covers the wizard method, because it is the recommended method for most users. See the MiKTEX FAQ[2] <http://www.miktex.org/faq/>, for a detailed description of the FTP method.

1. Download the latest version of the wizard from the SourceForge.net download server[3] <http://sourceforge.net/project/showfiles.php?group_id=10783>.
2. Start the wizard (`setup.exe`). You will be presented with the welcome page:



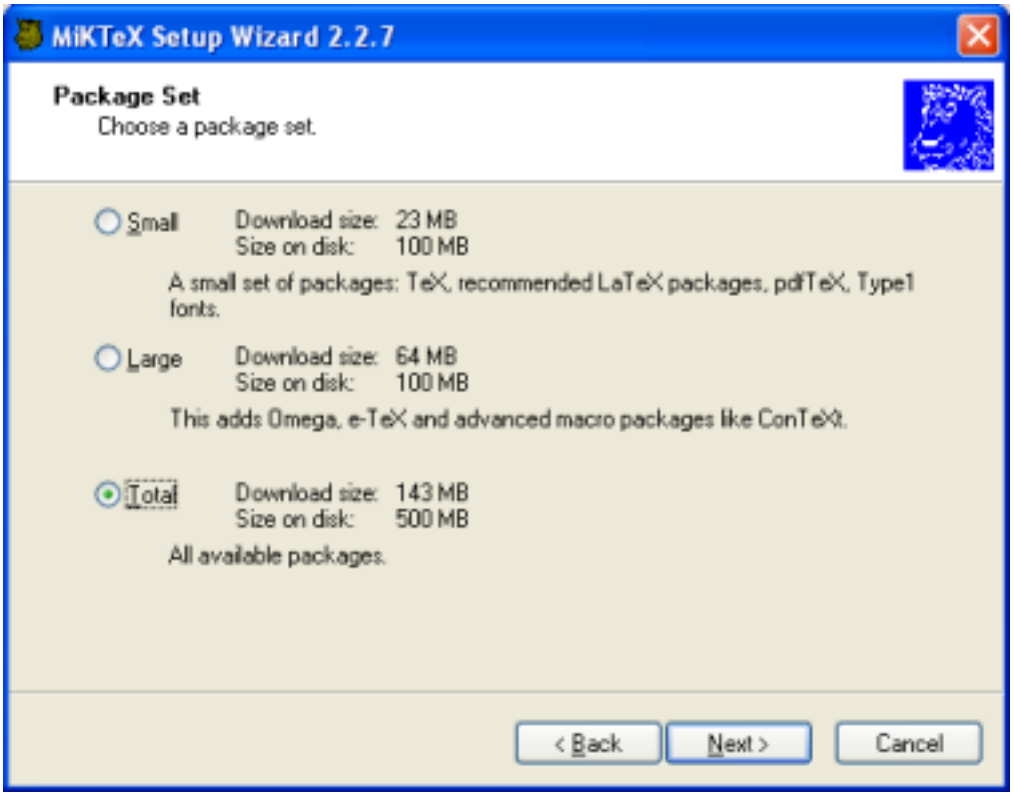
   Click **Next >** to advance to the next page.
3. Click on the **Download only** radio button:

[2] <http://www.miktex.org/faq/>
[3] <http://sourceforge.net/project/showfiles.php?group_id=10783>



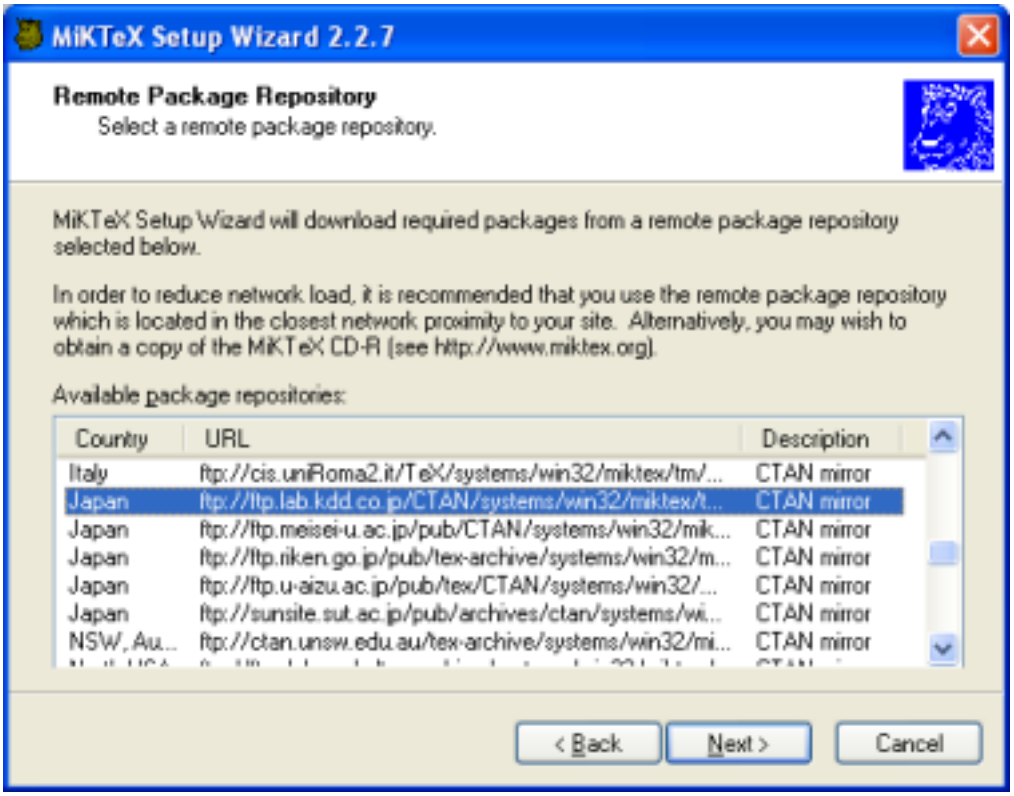
Click **Next >** to go to the next page.

4. Click on the package set that you wish to download:



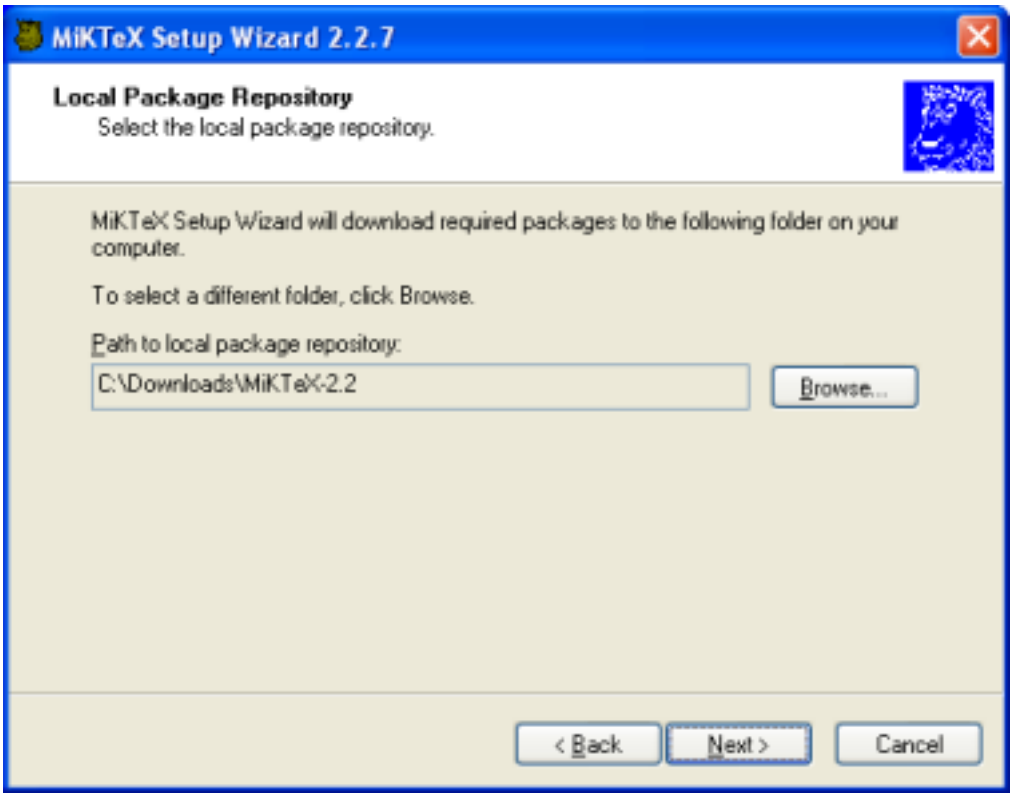
Click **Next >** to go to the next page.

5. Choose a download location:



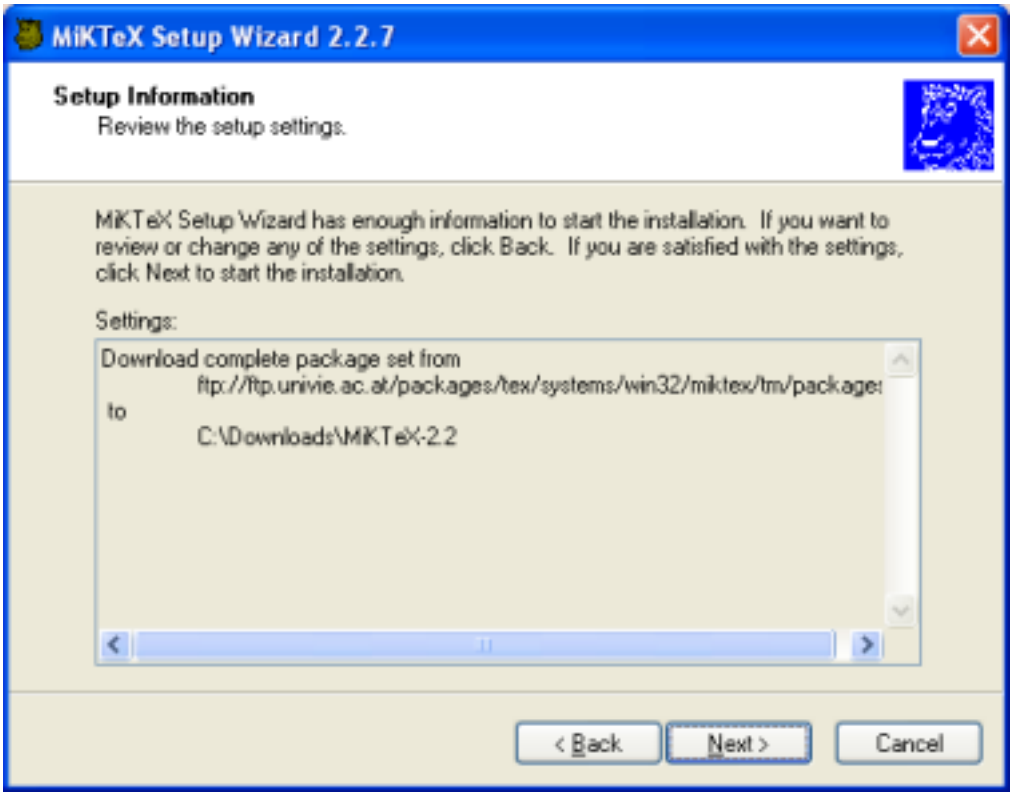
MiKTEX Setup Wizard will download packages from a remote package repository. Choose a repository which is located in the closest network proximity to your location. Click **Next >** to go to the next page.

6. Specify the location of the local package repository:



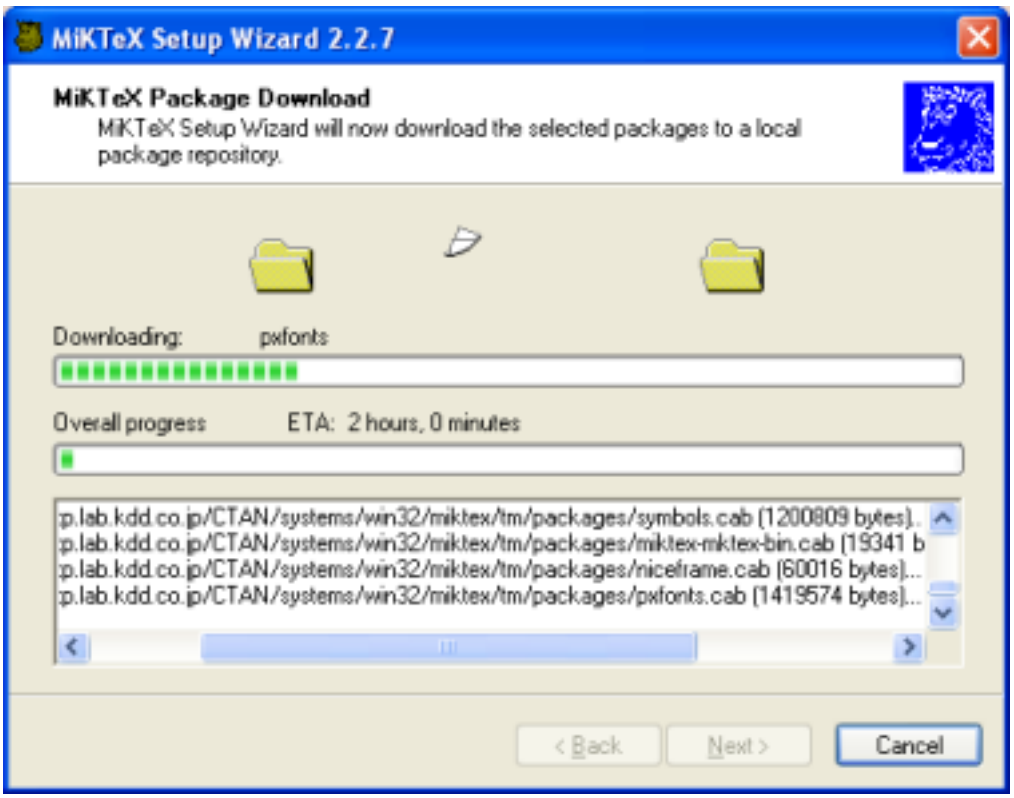
Downloaded packages will be stored in the *local package repository*, a directory on your computer. Later you will run the wizard again to install MiKTEX from here. Click **Next >** to go to the next page.

7. Review the download settings:



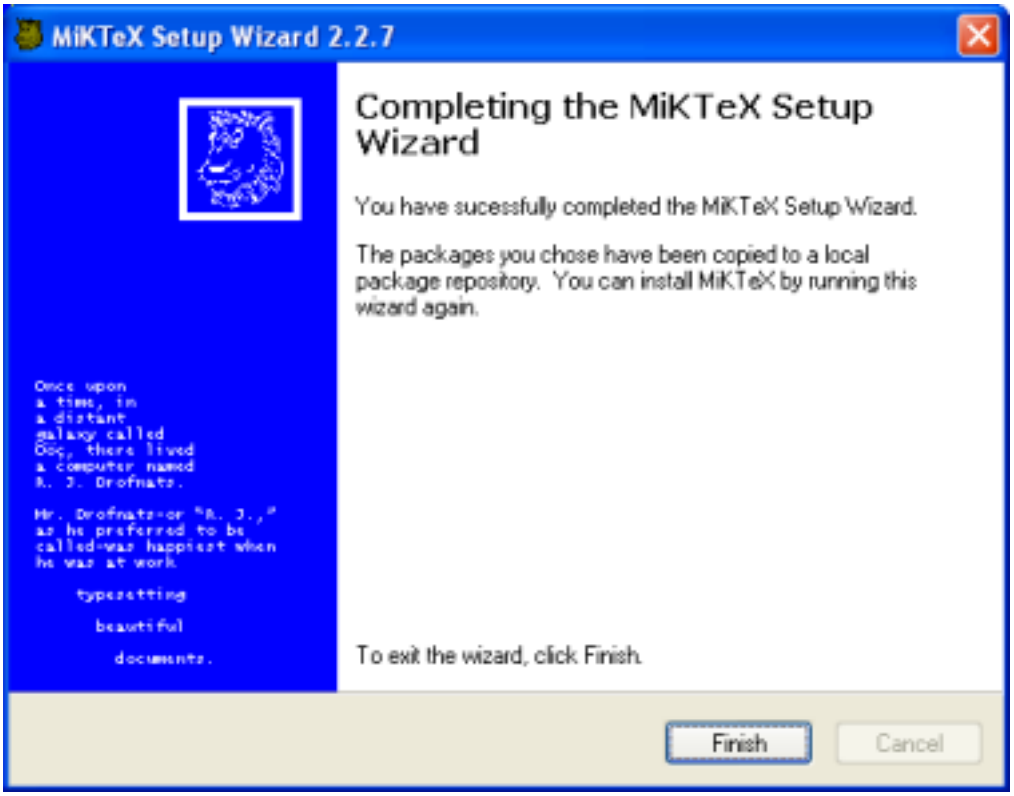
Click **< Back**, if you want to change the settings. Click **Next >** to start the download process.

8. Two progress bars indicate the progress of the download operation:



Click **Next >** when the download is complete.

9. You will see the final wizard page:



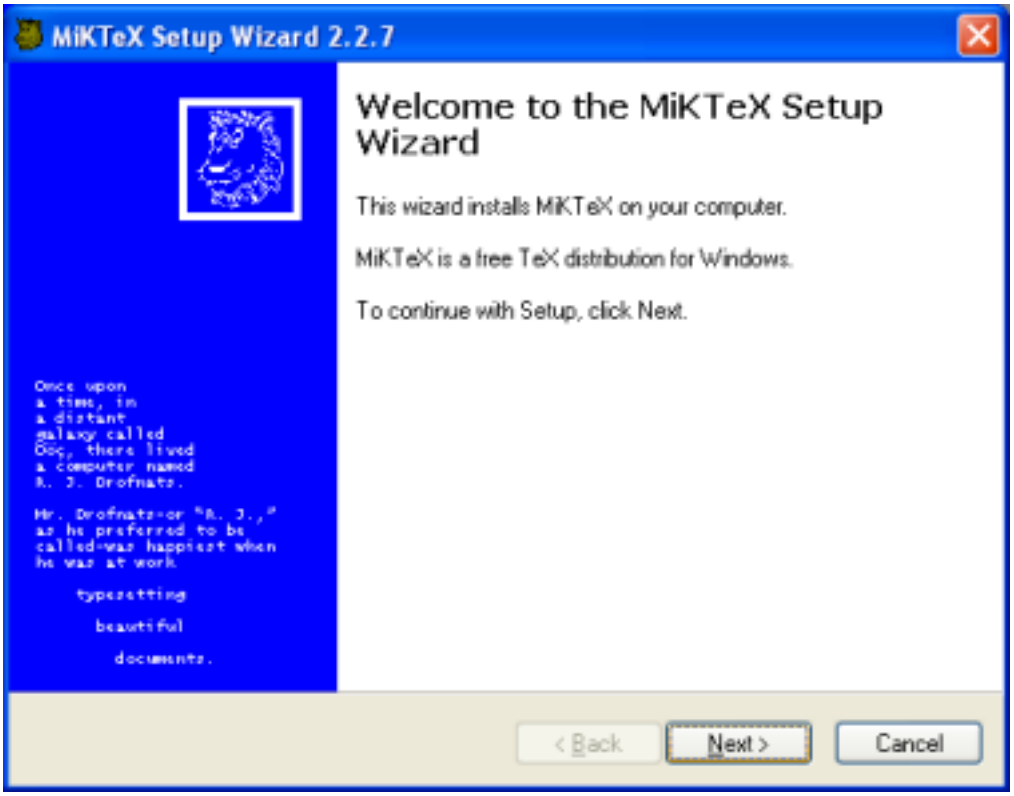
Click **Finish** to close the wizard.

2.1.4 Installing MiKTEX

You install MiKTEX with the help of MiKTEX Setup Wizard:

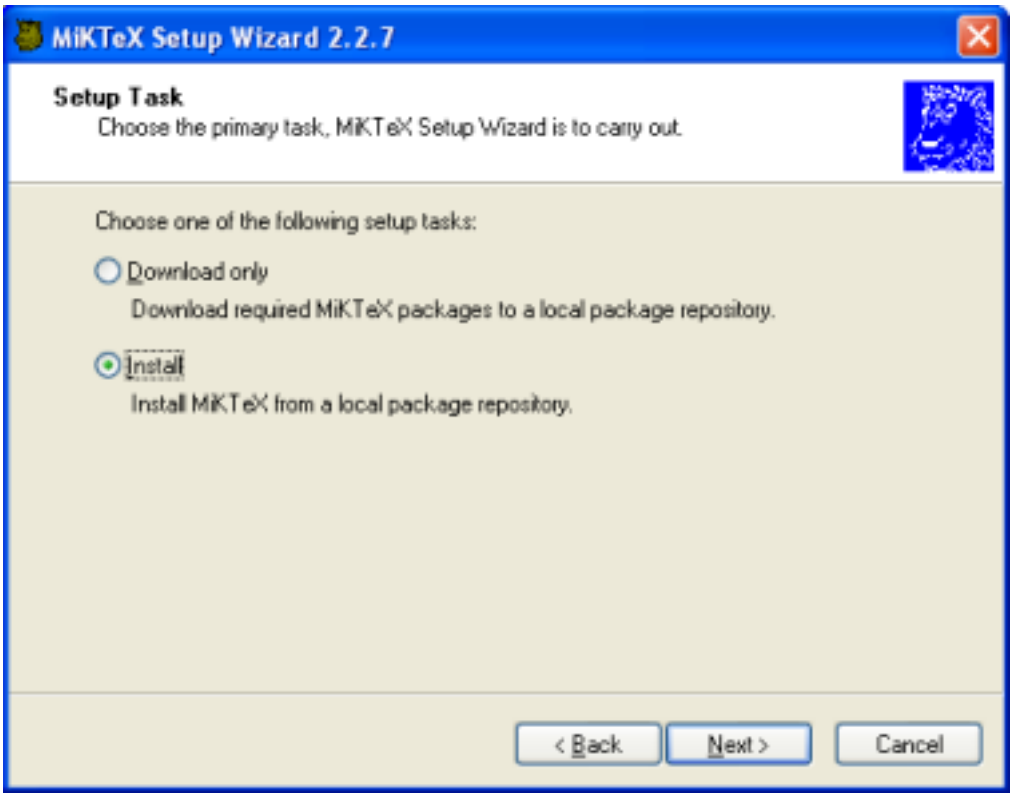
1. Download the latest version of the wizard from the SourceForge.net download server[4] <http://sourceforge.net/project/showfiles.php?group_id=10783>.
2. Login as Administrator, if you want to set up a shared MiKTEX system.
3. Start the wizard (`setup.exe`). You will be presented with the welcome page:

[4] <http://sourceforge.net/project/showfiles.php?group_id=10783>



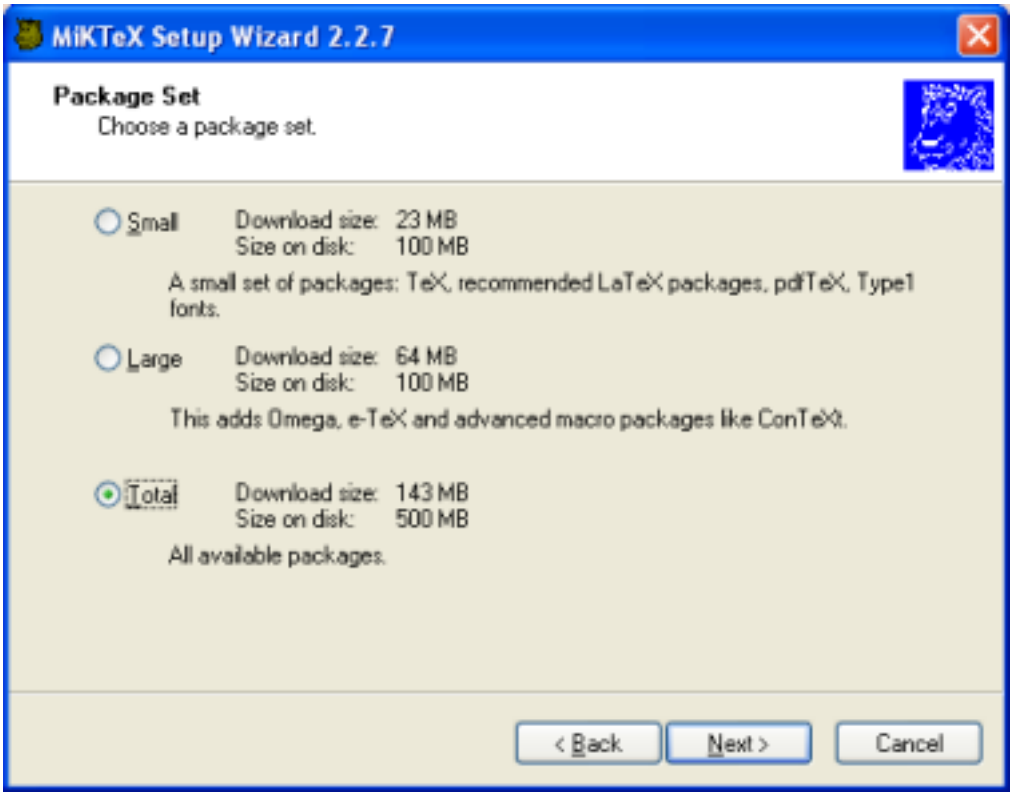
Click **Next >** to go to the next page.

4. Click on the **Install** radio button:



Click **Next >** to go to the next page.

5. Click on the package set you wish to install:

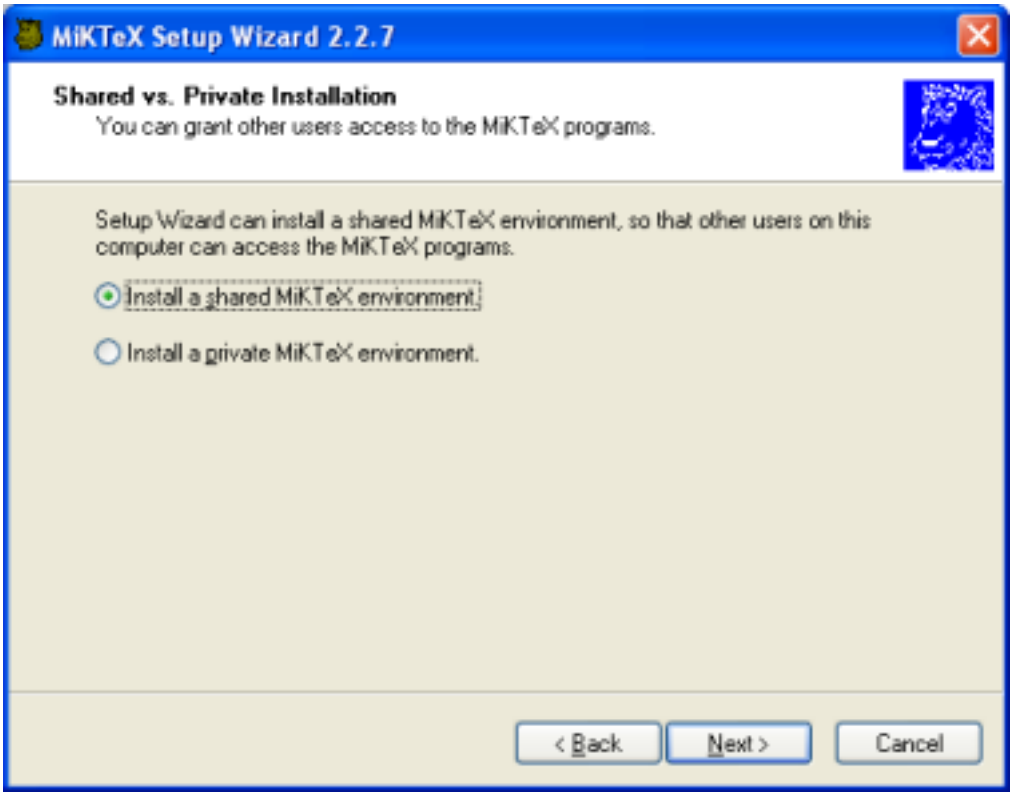


NOTE

The selected package set must match the downloaded package set, e.g., you cannot install the large package set when you have downloaded the small package set.

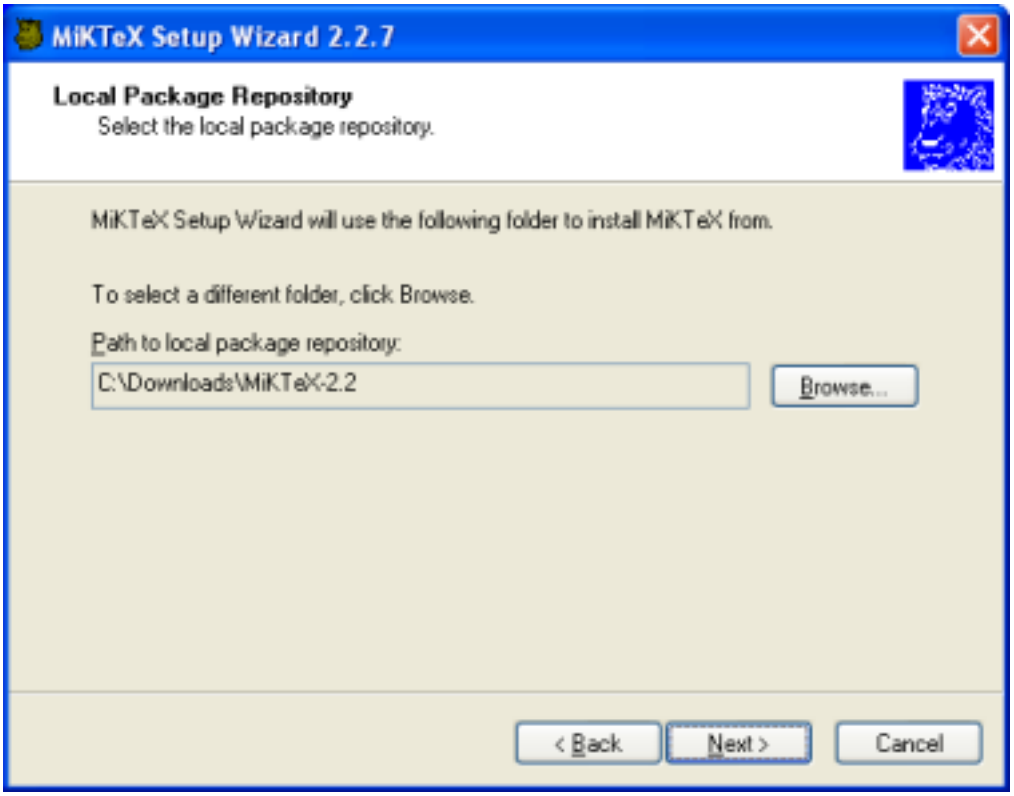
Click **Next >** to go to the next page.

6. Choose if you want to set up a shared MiKTEX system or if you want to use MiKTEX privately:



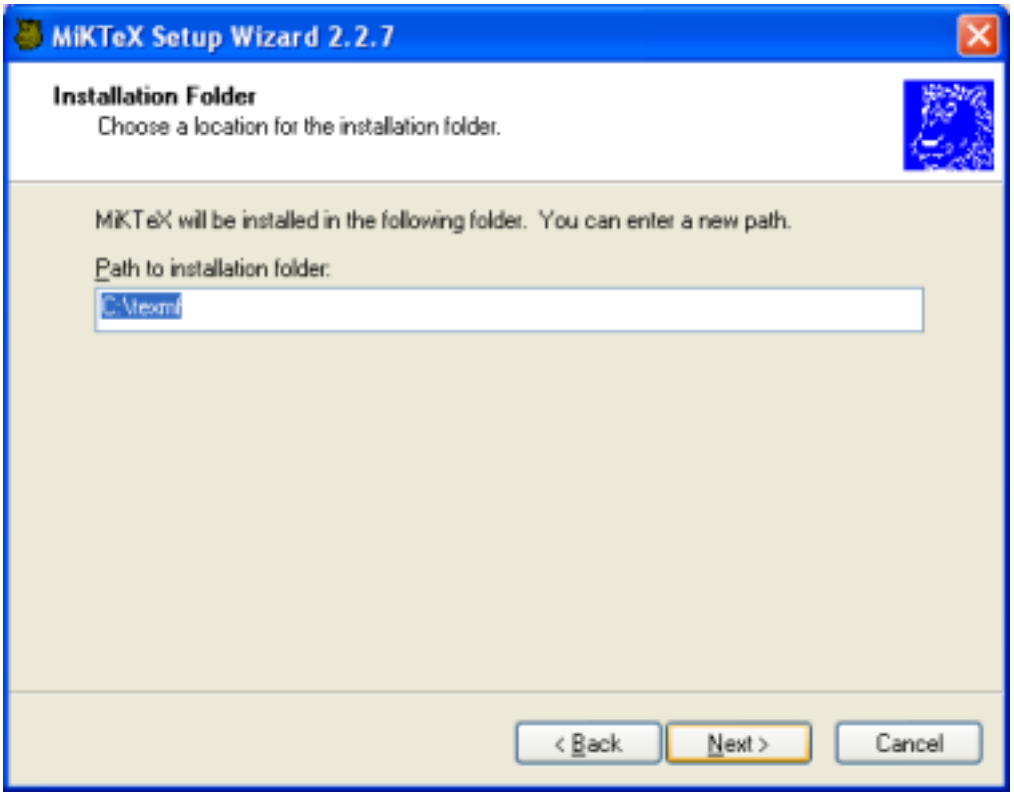
Click **Next >** to go to the next page.

7. Specify the location of the local package repository:



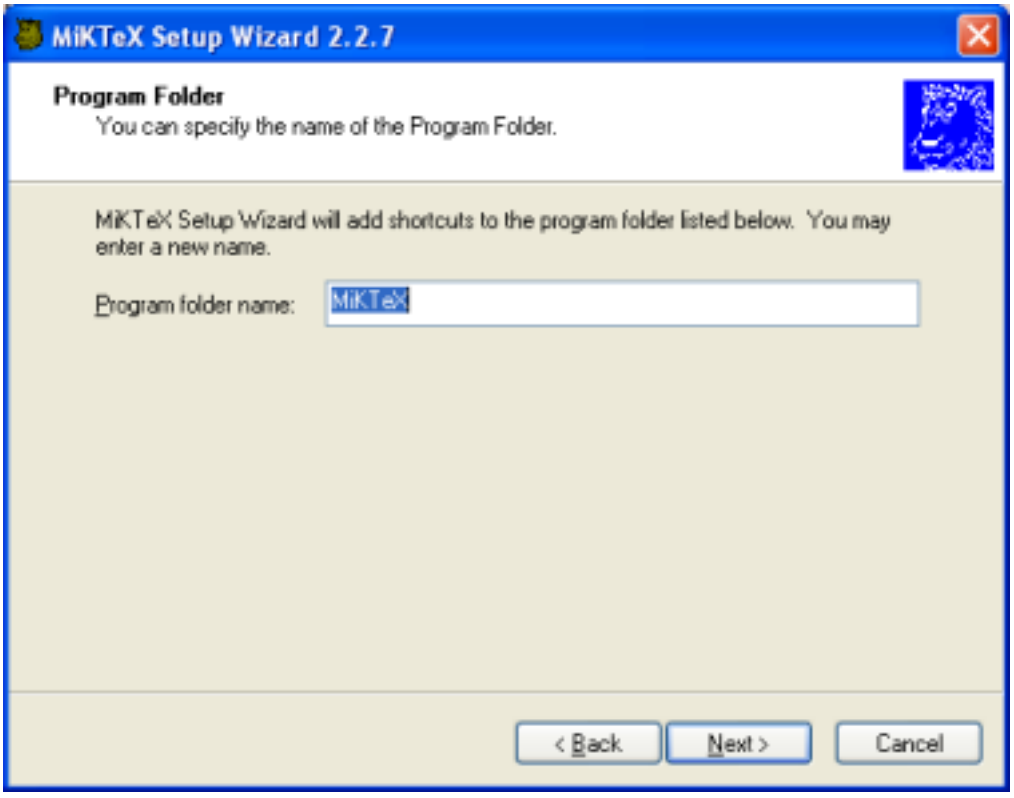
MiKTEX will be installed from a local package repository which mirrors the contents (or parts of it) of a remote package repository. You have created the local package repository during the download stage. Click **Next >** to go to the next page.

8. Accept the suggested installation directory or enter your own choice:



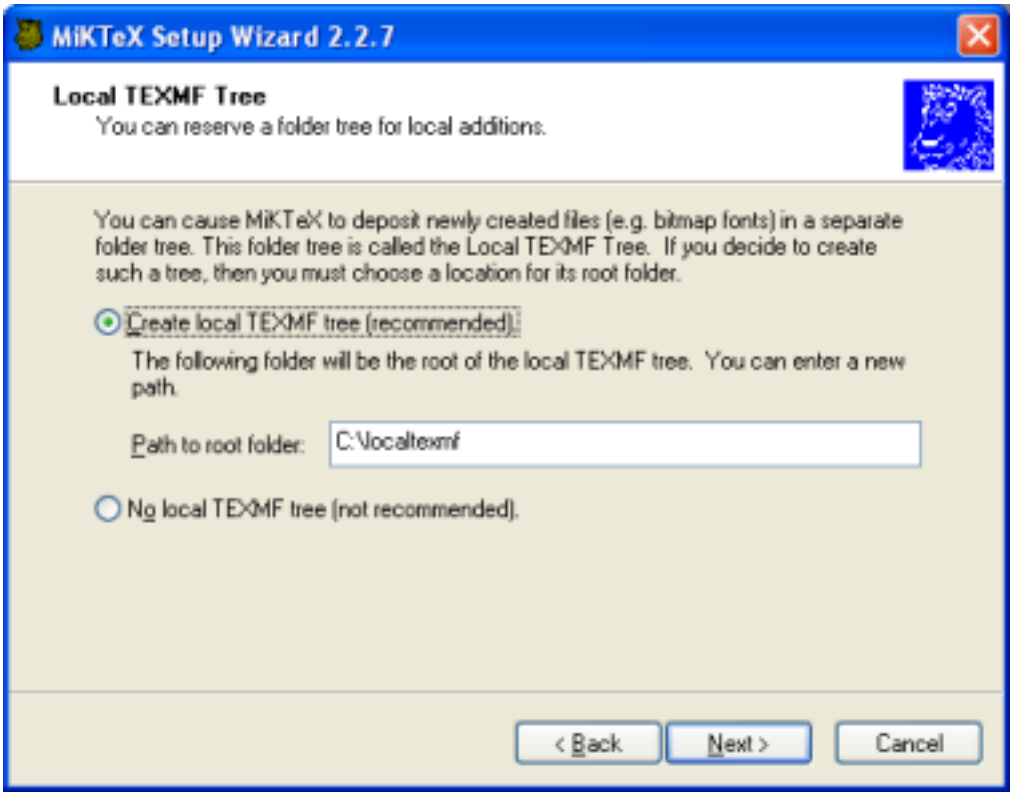
The installation directory is the root of the main TEXMF directory hierarchy. Click **Next >** to go to the next page.

9. Accept the suggested program folder name or enter your own choice:



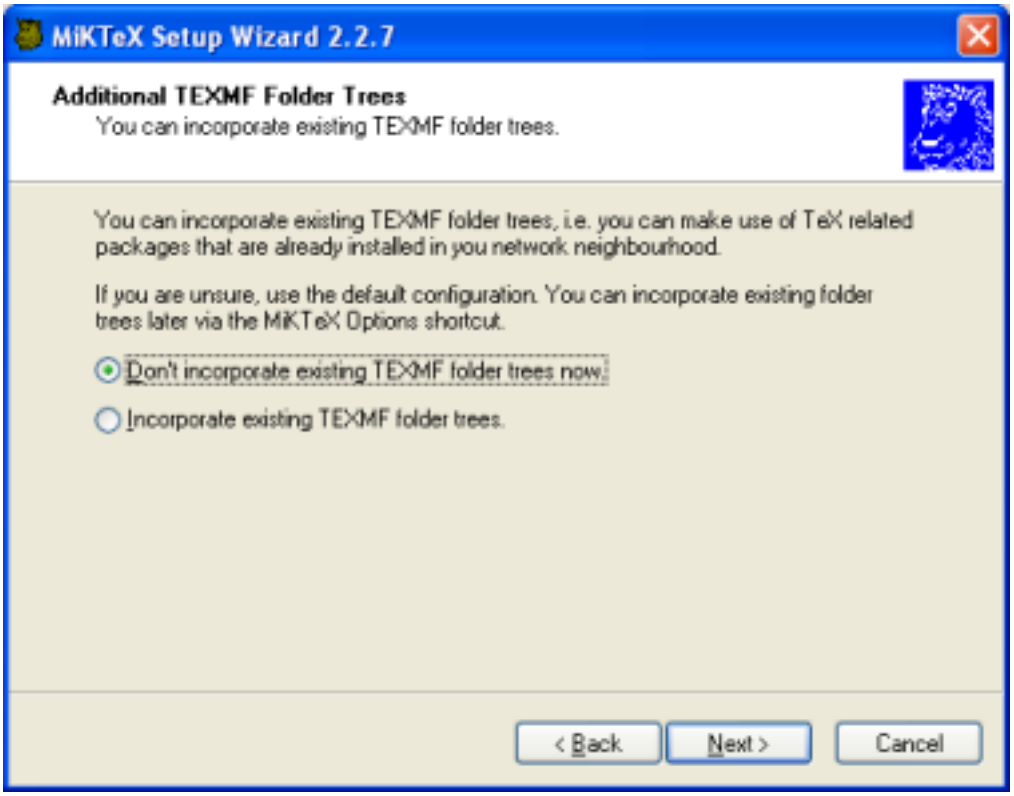
Click **Next >**, to go to the next page.

10. Accept the suggested path to the local TEXMF directory or enter your own choice:



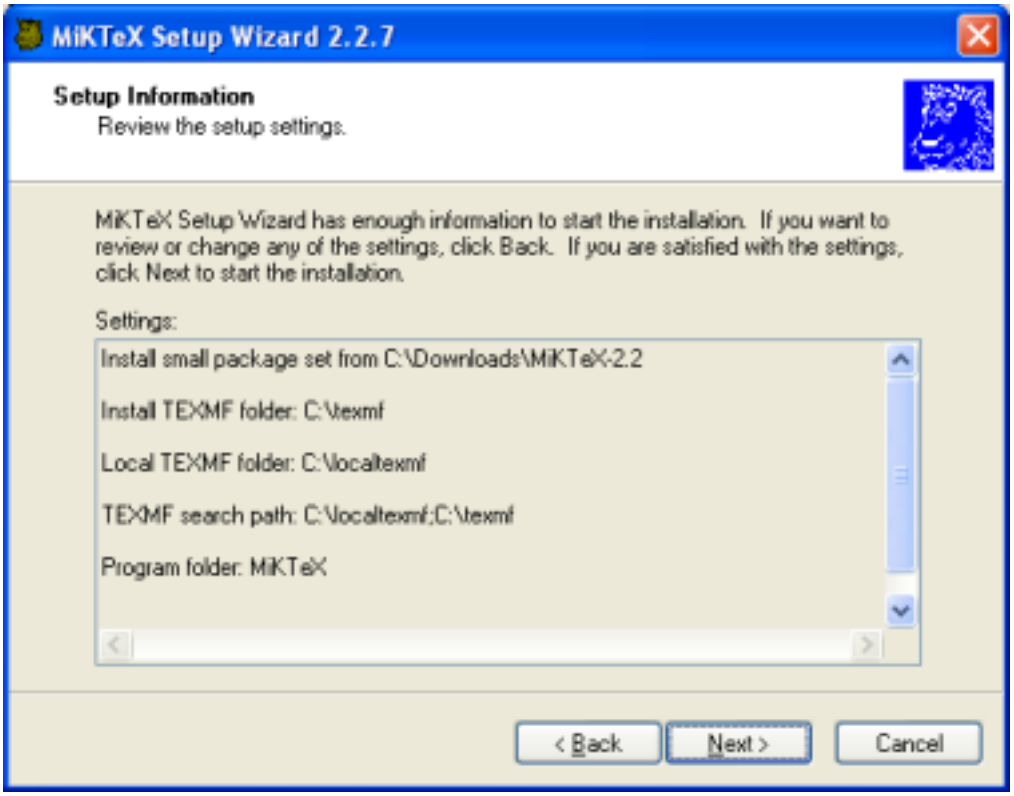
The local TEXMF directory is mainly used for files that are created during run-time. Click **Next >** to go to the next page.

11. Choose if you want to incorporate additional TEXMF directories:



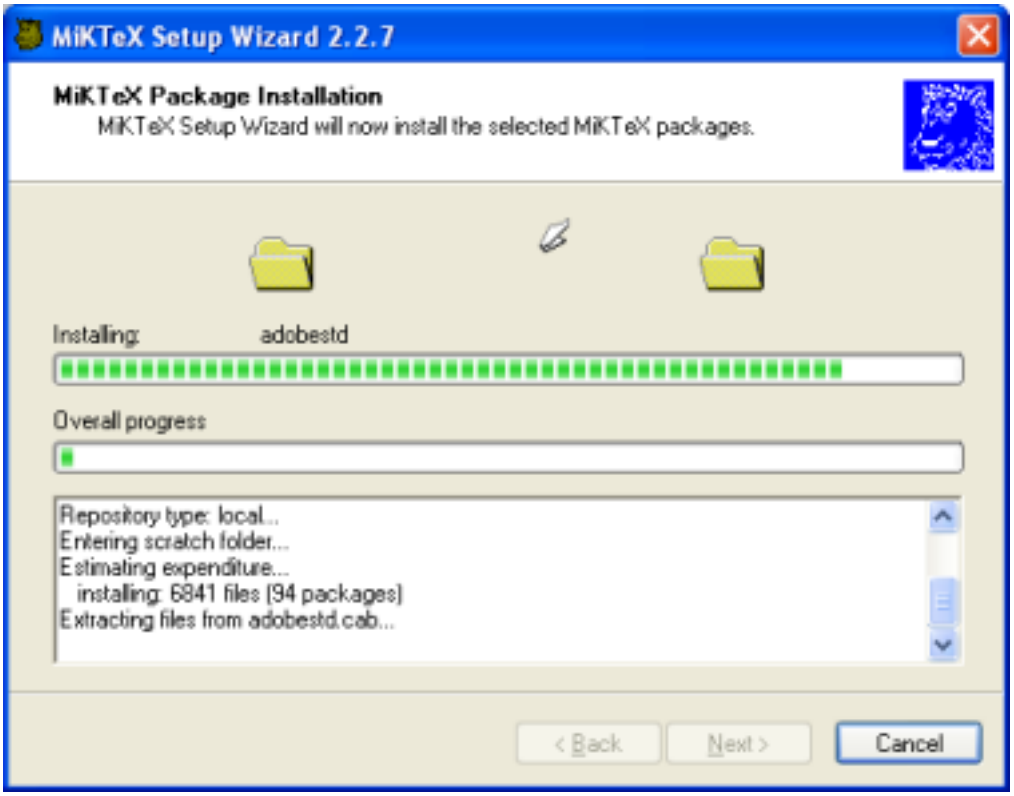
You can safely defer the decision. TEXMF trees can be configured later with the help of MiKTEX Options. Click **Next >** to go to the next page.

12. Review the setup settings:



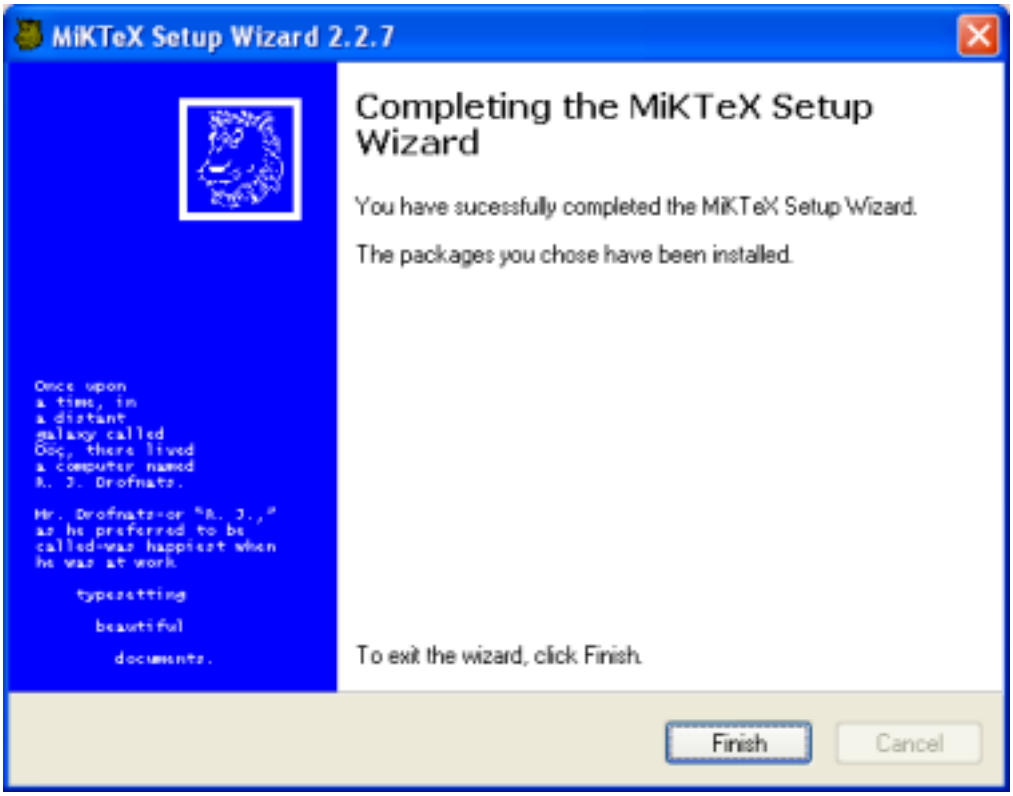
Click **< Back**, if you want to change the settings. Click **Next >** to start the installation process.

13. Two progress bars indicate the progress of the installation process:



Click **Next >** when the installation is complete.

14. You will see the final wizard page:



Click **Finish** to close the wizard.

2.1.5 Making Sure that the Installation Worked

Open a command prompt window and run the following commands (prefixed with >):

```
> latex sample2e
This is e-TeX, Version 3.141592-2.1 (MiKTeX 2.4)
entering extended mode
(C:\texmf\tex\latex\base\sample2e.tex
LaTeX2e <2001/06/01>
Babel <v3.7m> and hyphenation patterns for english, french, german, ngerman, du
mylang, nohyphenation, loaded.
(C:\texmf\tex\latex\base\article.cls
Document Class: article 2001/04/21 v1.4e Standard LaTeX document class
(C:\texmf\tex\latex\base\size10.clo))
No file sample2e.aux.
(C:\texmf\tex\latex\base\omscmr.fd) [1] [2] [3] (sample2e.aux) )
Output written on sample2e.dvi (3 pages, 7256 bytes).
Transcript written on sample2e.log.
> yap sample2e
>
```

2.1.6 Troubleshooting the Setup Process

MiKTEX Setup Wizard logs all actions into the DebugView window. You may want to download and install DebugView, if you intend to troubleshoot setup related problems.

To download DebugView, visit the DebugView page[5] <http://www.sysinternals.com/ntw2k/freeware/debugview.shtml> and follow the download/installation instructions.

To create a trace, start DebugView prior to the setup wizard.

[5] <http://www.sysinternals.com/ntw2k/freeware/debugview.shtml>

In addition, the wizard reports some actions into a log file. The name of the log file is `setup-`*`currentdate`*`.log`. Search for this file in the config directory (usually `C:\texmf\miktex\config\`).

2.2 Advanced Installation Options

2.2.1 Driving MiKTEX Setup Wizard

MiKTEX Setup Wizard reads options from the file `setupwiz.opt`, if it exists.

It is also possible to specify options on the command-line, though this is a bit intricated. You have to stick to the following syntax:

`setup.exe /C:"PreSetup setupwiz -setup-path=""#e"" `*`options`*`"`

Note that the placement of quotation marks is important, and that `#e` is surrounded with two pairs of double quotation marks.

For example, this command starts the wizard in unattended mode:

```
> setup.exe /C:"PreSetup setupwiz --setup-path=""#e"" --unattended"
>
```

MiKTEX Setup Wizard obeys the following command-line options:

`-additional-directory-trees `*`dirs`*
: Register extra TEXMF directory trees. *`dirs`* is a semicolon-separated list of fully qualified directory names.

`-allow-unattended-reboot`
: Restart the system, if necessary.

`-download-only`
: Download all required packages, but do not otherwise install MiKTEX.

`-dry-run`
: Simulate the setup process. No files shall be downloaded and/or installed.

`-install-from-local-repository`
: Install MiKTEX from a local package repository.

`-installation-directory `*`dir`*
: Register the location of the installation directory.

`-local-directory `*`dir`*
: Register the location of the local TEXMF directory.

`-local-package-repository `*`dir`*
: Register the location of the local package repository.

`-no-additional-directory-trees`
: Do not incorporate additional TEXMF trees.

`-private`
: Install MiKTEX for the current user only. This is the default.

`-program-folder `*`folder`*
: Register the name of the MiKTEX program folder.

`-remote-package-repository `*`url`*
: Register the URL of the remote package repository.

`-shared`
: Install MiKTEX for everyone. This option requires administrative privileges.

`-unattended`
: Run in unattended mode.

This is an example of a `setupwiz.opt` file:

```
--install-from-local-repository
--local-package-repository \\mirrors\tm\packages
--installation-directory C:\texmf
--local-directory C:\localtexmf
--unattended
```

In this example, MiKTEX is installed from the network directory `\\mirrors\tm\packages\`. The wizard is run in unattended mode.

2.2.2 Shared Network Installation

Setting up a shared network installation requires a copy of the MiKTEX CD-R (see Section 1.3.2).

Create a shared directory, say `\\server\miktex\`, which contains the contents of the MiKTEX CD-R.

The MiKTEX CD-R comes with a special version of the setup wizard, which offers users the option **Prepare to run MiKTeX from the CD**.

2.3 Items in the Start Menu

MiKTEX Setup Wizard installs the following menu items in the Windows start menu:

MiKTeX → Help → LaTeX2e Reference
A LaTeX2e reference manual.

MiKTeX → Help → MiKTeX FAQ
Answers to frequently asked questions.

MiKTeX → Help → MiKTeX Manual
The MiKTEX manual.

MiKTeX → Help → MiKTeX Tips
Tips for MiKTEX users.

MiKTeX → MiKTeX on the Web → Known Issues
An Internet shortcut to the latest release notes.

MiKTeX → MiKTeX on the Web → MiKTeX Project Page
An Internet shortcut to the project page.

MiKTeX → MiKTeX on the Web → Registration
An Internet shortcut to the registration form.

MiKTeX → DVI Viewer
A shortcut to the DVI file viewer.

MiKTeX → MiKTeX Options
A shortcut to the configuration utility.

MiKTeX → MiKTeX Package Manager
A shortcut to the package manager.

MiKTeX → MiKTeX Update Wizard
A shortcut to the update wizard.

2.4 The TEXMF Directory Hierarchy

A *TEXMF directory* is the root of a TDS[6]-compliant directory structure, as described in *A Directory Structure for TeX Files* (run `texdoc tds` to view this document).

A standard MiKTEX system is composed of two TEXMF directories:

[6] TDS: TEX directory structure

- The *installation directory* contains the installed files of the MiKTEX distribution.
- The *local TEXMF directory* contains files that were created during the use of the MiKTEX programs.

You can declare additional TEXMF directories, if the need arises. For example, you can incorporate the TEXMF directory of another TEX system (such as Tex Live). Or you can create a personal TEXMF directory (say, `C:\MyTeXMF`) which serves as a repository for your own TEX related files. See Section 3.3, for more information.

2.4.1 The Installation Directory

> CAUTION
>
> The contents of the installation directory must be regarded read-only, i.e., no files should be added, removed or changed here.

The installation directory is the root of a TDS-compliant directory hierarchy. It contains the files installed by the MiKTEX Setup Wizard.

If you have installed MiKTEX on the system drive, then the path to the installation directory is `C:\texmf`, unless you have specified another path. You can use the MiKTEX Options application to find out the path to the installation directory.

2.4.2 The Local TEXMF Directory

The local TEXMF directory is the root of a TDS-compliant directory hierarchy. It contains files that are created during use of the MiKTEX programs. It can also contain your personal additions, such as your own style files.

If you have installed MiKTEX on the system drive, then the path to the local TEXMF directory is `C:\localtexmf`, unless you have specified another path.

If you are running the MiKTEX programs from the MiKTEX CD, then the path to the local TEXMF directory is `C:\MiKTeXDirect`.

You can use the MiKTEX Options application to find out the path to the local TEXMF directory.

2.5 Removing MiKTEX

MiKTEX can be removed via the Windows control panel:

1. Open Control Panel (usually via **Start** → **Settings** → **Control Panel**).
2. Click on the **Software** (resp. **Add/Remve Programs**) icon.
3. Select **MiKTeX**.

Chapter 3

Configuring MiKTEX

3.1 Installing Updates

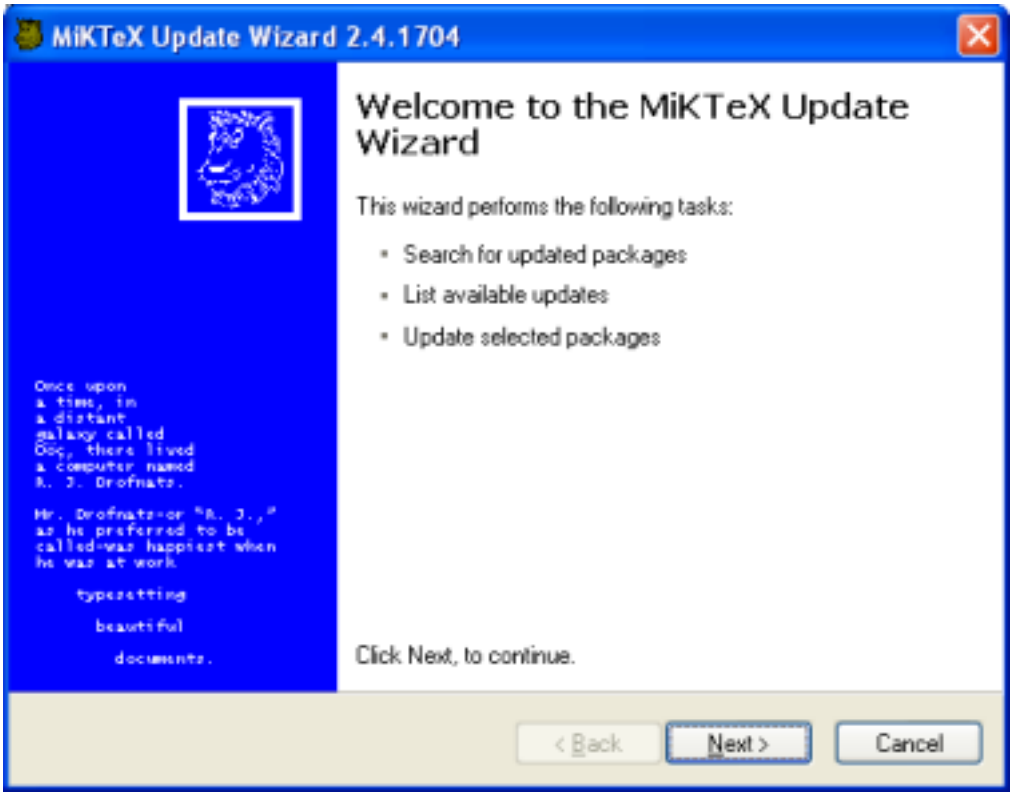
You can use MiKTEX Update Wizard to download and install the latest MiKTEX updates.

3.1.1 How It Works

1. MiKTEX Update Wizard contacts a remote package repository and retrieves the updated package database.
2. The time-stamps of local packages and remote packages are compared. If a remote package is newer than the corresponding local package, than that package is added to the *update list*.
3. MiKTEX Update Wizard goes through the update list and updates the packages.

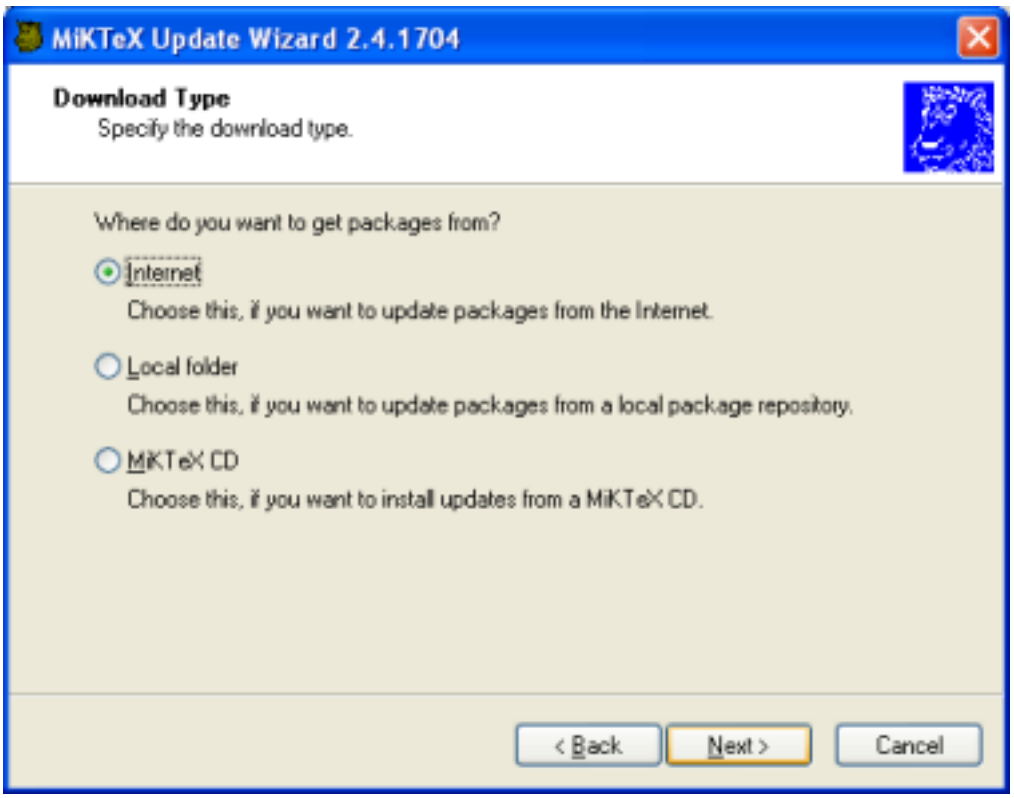
3.1.2 Running MiKTEX Update Wizard

1. Click **Start** → **Programs** → **MiKTeX** → **MiKTeX Update Wizard**.
2. The wizard starts and you are presented with the welcome page:



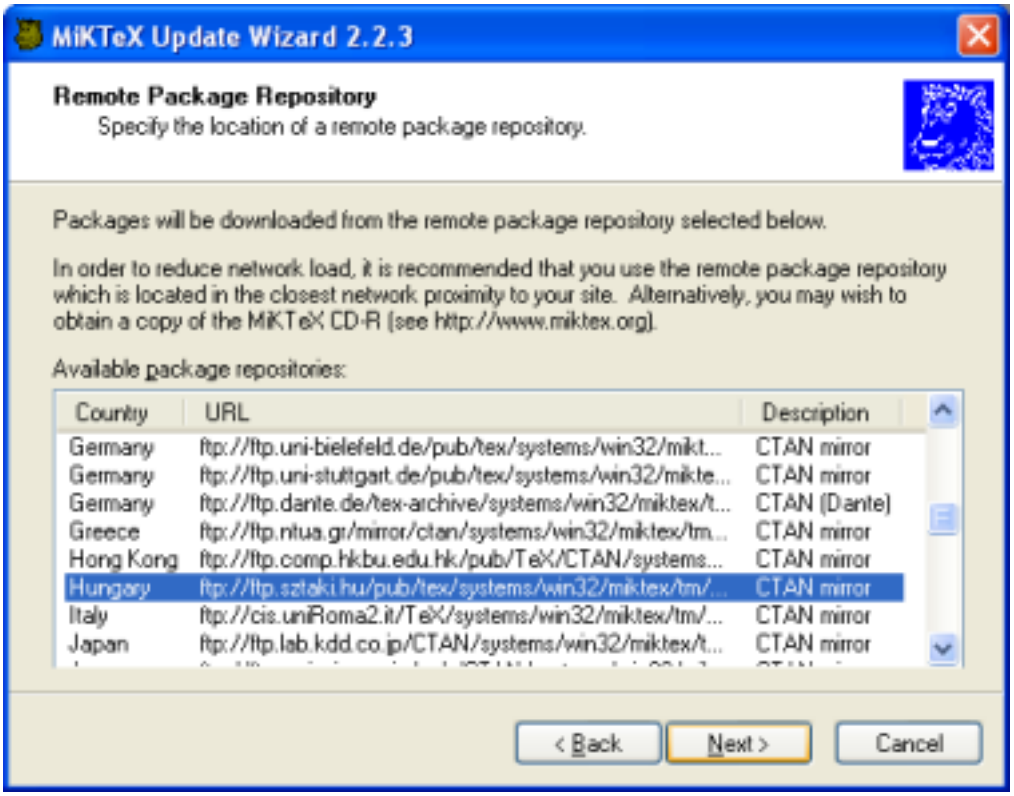
Click **Next >** to continue.

3. The wizard asks you to choose a download source:



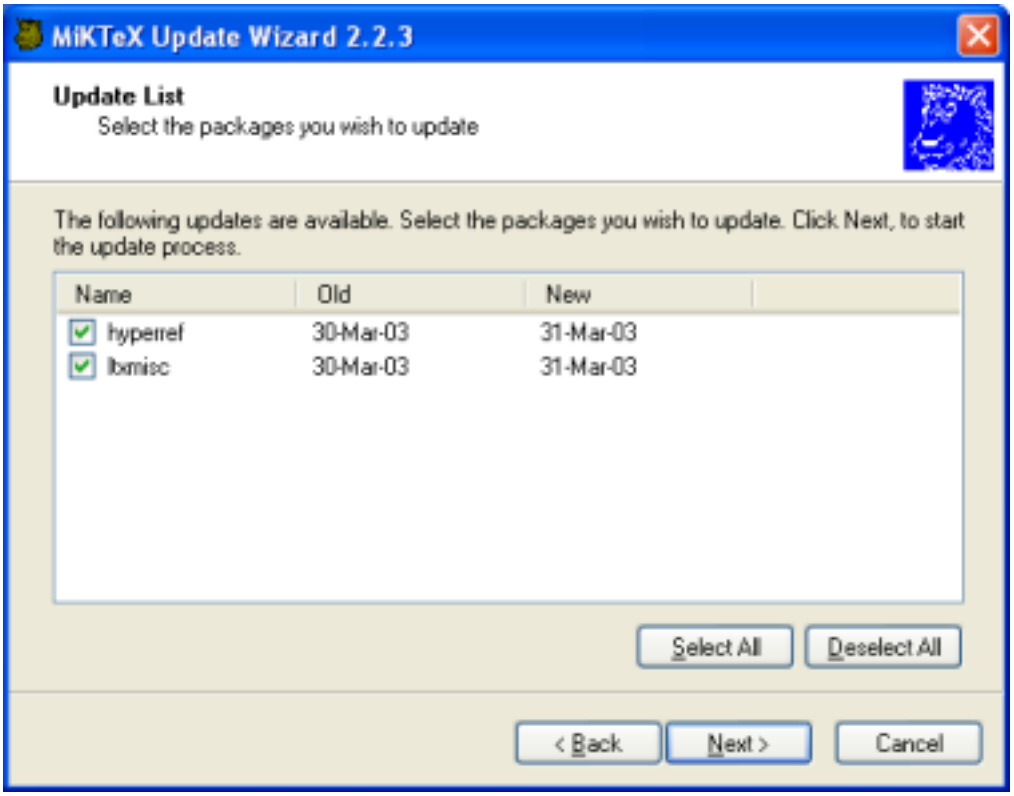
Choose **Internet** to install updates from a remote package repository. Choose **Local folder**, if you are mirroring a remote package repository on your computer. Chosse **MiKTeX CD**, if you have a new edition of the MiKTEX CD. Click **Next >** to continue.

4. If you have chosen to install packages from a remote package repository, MiKTEX Update Wizard lists the available package repositories. Choose the nearest repository:



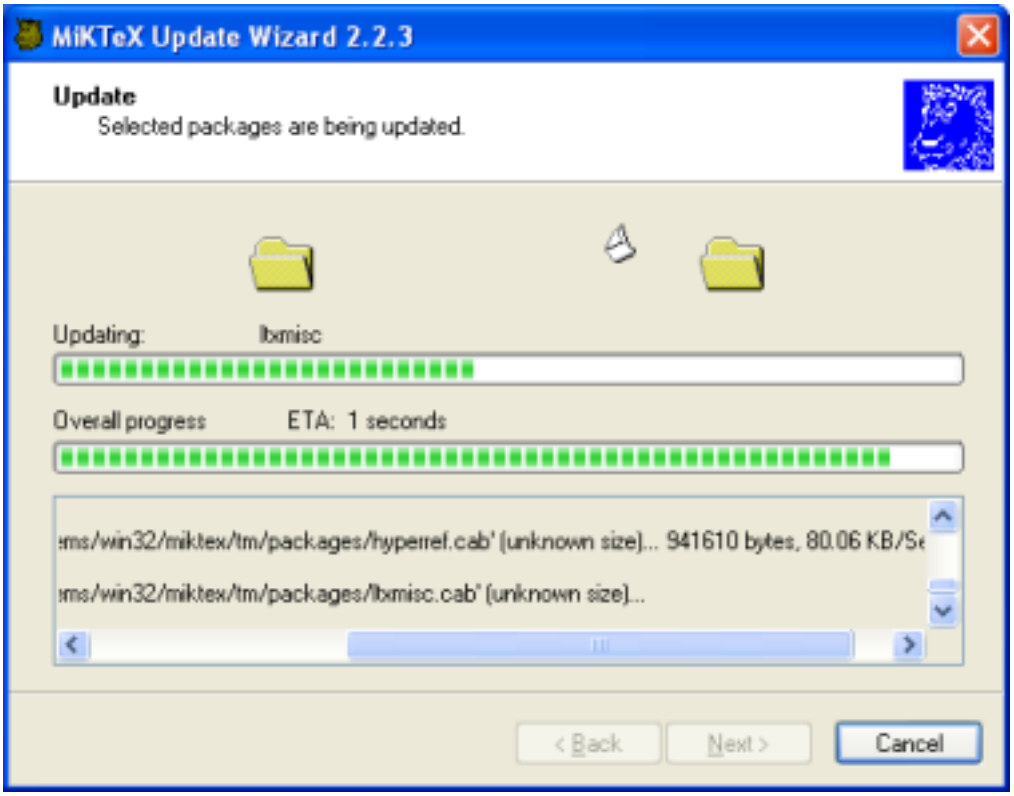
Click **Next >** to continue.

5. A list of updateable packages is displayed. Choose the packages you wish to update:



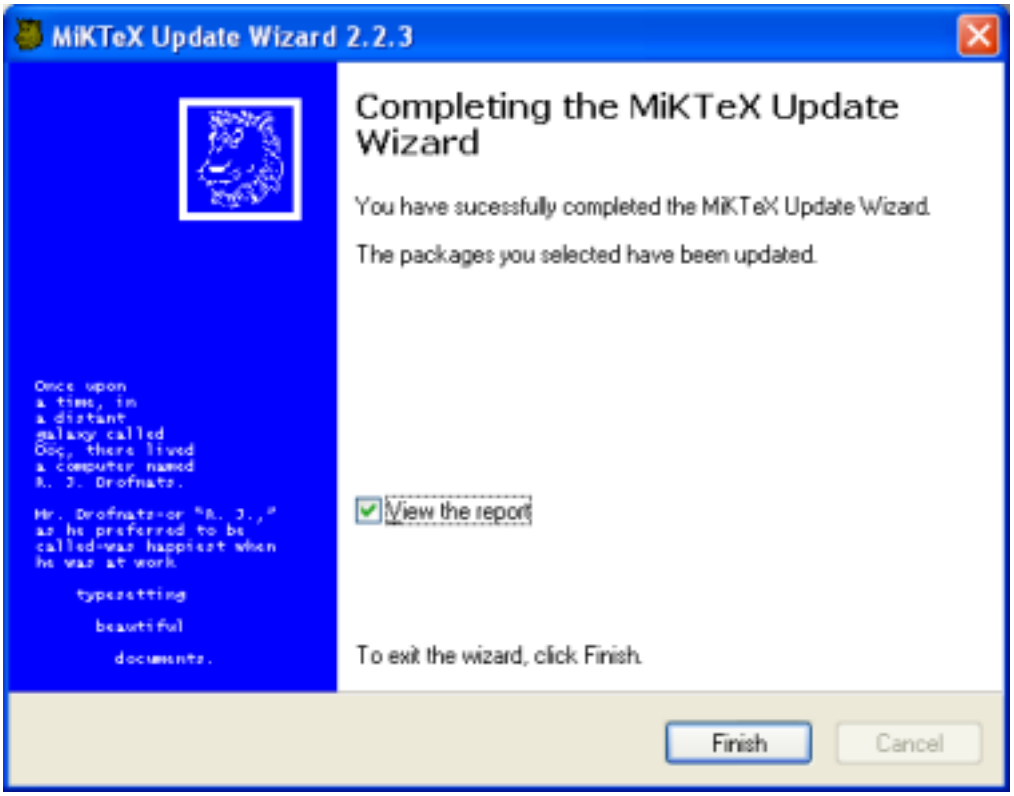
Click **Next >** to start the update process.

6. MiKTEX Update Wizard now updates the selected packages:



Click **Next >** when the update operation is complete.

7. MiKTEX Update Wizard displays the last page:



Click **Finish** to close the wizard.

The wizard records update events into a log file by the name of `update-`*`currentdate`*`.log`. This file can be found in the MiKTEX config directory (usually `C:\localtexmf\miktex\config`).

3.2 Package Management

You use MiKTEX Package Manager (MPM) to install and remove packages.

3.2.1 What Is a Package?

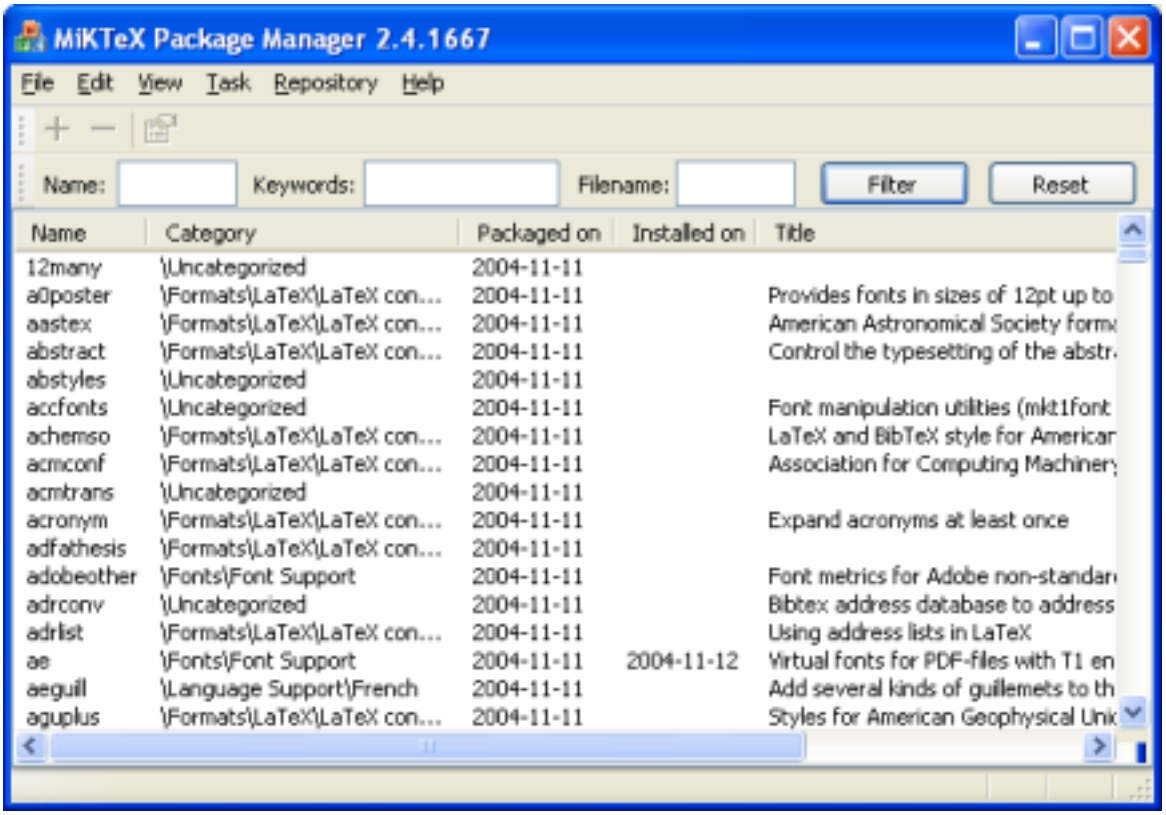
A package is a collection of files that (together) implement a specific feature.

3.2.2 Working With the Package Manager

The package manager can be run in two modes: batch and windowed.

MPM runs in batch mode if you specify command-line options such as `-install` and `-update` (see Section A.9 for a list of available command-line options).

To start the package manager in windowed mode, click **Start** → **Programs** → **MiKTeX** → **MiKTeX Package Manager**). You will see a window similar to this:



3.2.2.1 Installing Packages

You install packages as follows:

1. Select all wanted packages in the list view.
2. Click on **+** to install the packages.

For example: you want to install the ConTEXt package:

1. Locate and select the ConTEXt package in the list view, e.g., type the key sequence **C O N T**.
2. You can now click **+** to install the package.

3.2.2.2 Searching Packages

Sometimes you don't know the name of a package, but you know the name of a file that belongs to the wanted package. In this case, enter the file name information in the file name edit control. Note that the file name information can include wildcard characters (`*?`).

For example: you need to download the class file `weekly.cls`:

1. Enter `weekly.cls` in the file name edit control.
2. Click the **Filter** button.

The list view will be reduced to contain only the `calendar` package. Selecting `calendar` and pressing **+** will install the package.

3.2.3 Automatic Package Installation

The MiKTEX programs have the ability to install missing packages on-the-fly. You can configure this feature with MiKTEX Options:

1. Click **Start** → **Programs** → **MiKTeX** → **MiKTeX Options**.
2. The MiKTEX Options window opens. Click on the drop-down list labeled **Install missing packages on-the-fly**.
3. Select one of the following items:

   Yes Choose this to enable automatic package installation.

   No Choose this to disable automatic package installation.

   Ask me first
   Choose this, if you want to be asked everytime a package needs to be installed.

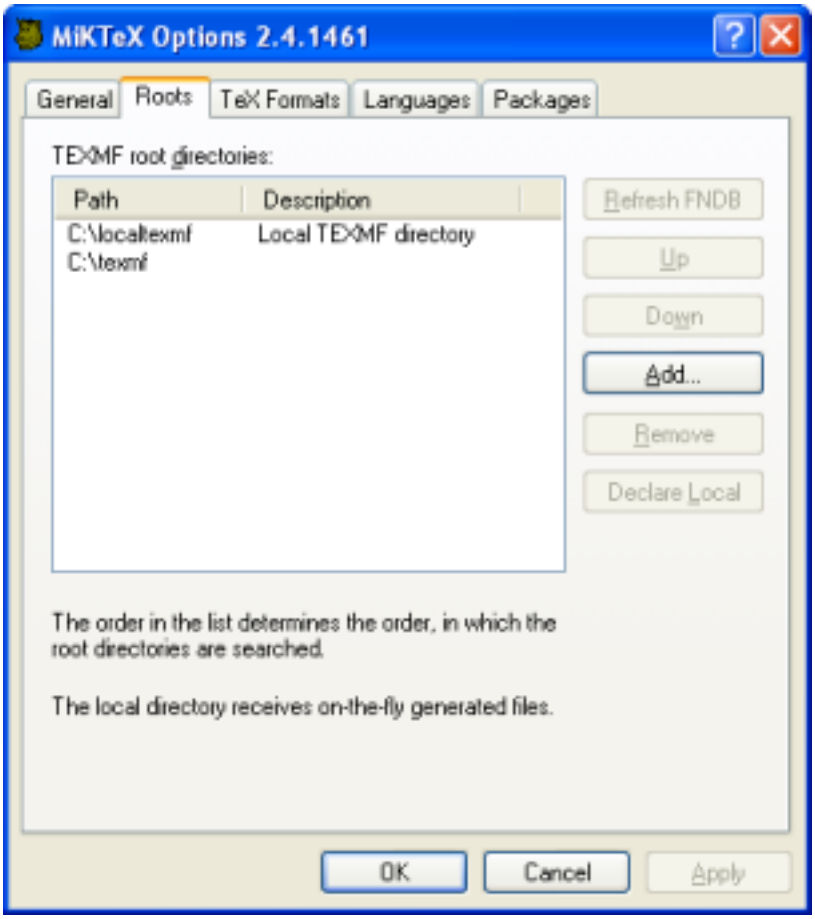
3.3 Managing TEXMF Directory Hierarchies

The standard setup process creates two TEXMF directories:

- `C:\texmf`: the installation directory (see Section 2.4.1).
- `C:\localtexmf`: the local TEXMF directory (see Section 2.4.2).

You can manage the TEXMF directory hierarchies with the help of MiKTEX Options:

1. Click **Start** → **Programs** → **MiKTeX** → **MiKTeX Options**.
2. The MiKTEX Options window opens. Click on the **Roots** tab.
3. The **Roots** page displays a list of TEXMF root directories that are used by MiKTEX:



3.3.1 Using Additional TEXMF Directories

You can incorporate additional TDS-compliant TEXMF directories into the MiKTEX setup.

For example: you can store your own files in a personal TEXMF hierarchy rooted at `C:\MyTeXMF`. To use this TEXMF directory, follow this procedure:

1. Click **Add**.
2. In the **Browse for Folder** dialog box, locate and choose `C:\MyTeXMF`.

`C:\MyTeXMF` will be added at the end of the list. You can move it to the second position (the local TEXMF directory should always be the first in the list), so that it gets a higher priority.

IMPORTANT

The TEXMF directory must be TDS-compliant. For example, if you want to use the directory for your own LATEX style files, you should put your files into the directory `tex\latex\mystuff` relative to the TEXMF directory. Run `texdoc tds`, to learn everything about the TDS.

3.3.2 Changing the Search Order

The order in the list view determines the order in which the TEXMF directories are searched.

You can change the search order as follows:

1. Select a directory.
2. Click **Up** or **Down** to move the selection up or down in the list.

CAUTION

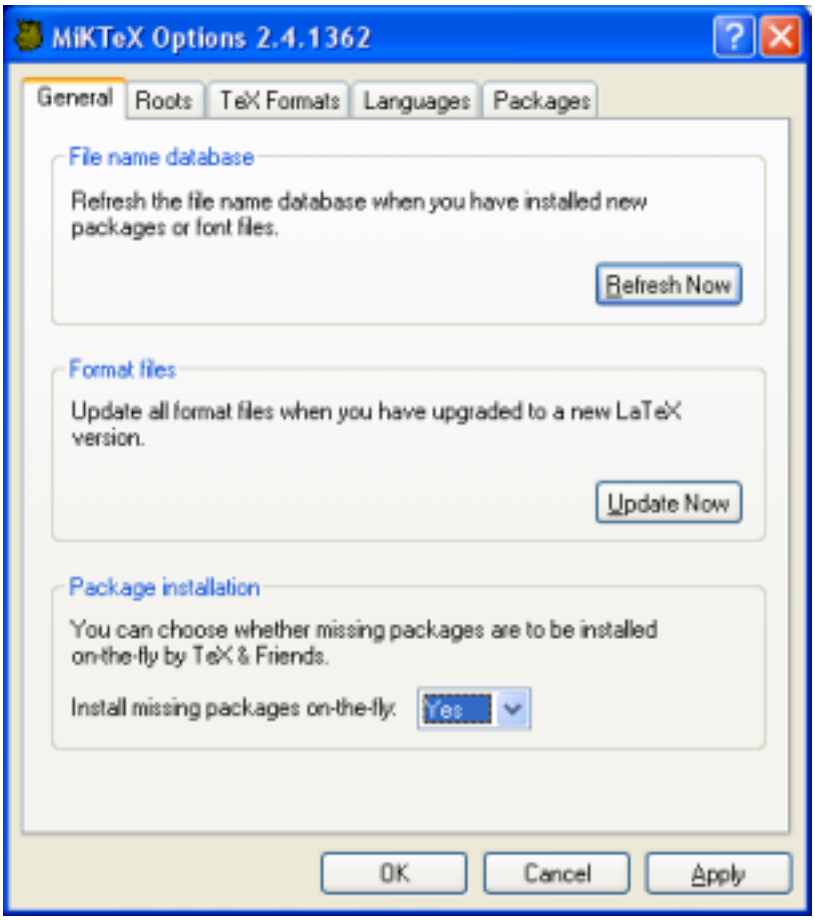
It is highly recommended that the local TEXMF directory is the first in the list.

3.4 Refreshing the File Name Database

To speed up file search, MiKTEX makes use of a list of known file names. This list is called the *file name database* (FNDB).

It is strongly recommended that you update the file name database whenever files are added to or removed from one of the TEXMF directories. You can update the file name database with the help of MiKTEX Options:

1. Click **Start** → **Programs** → **MiKTeX** → **MiKTeX Options**.
2. The MiKTEX Options window opens:



Click **Refresh Now**.

3.5 Managing Format Files

Many programs can load internal data structures from so called *format files*. For example, LaTeX macros are stored in the file `latex.efmt`. This file is loaed by ε-TeX, when you start **latex**.

3.5.1 Refreshing Format Files

The setup program has created standard format files in course of the installation process. You can refresh these format files in MiKTeX Options:

1. Click **Start** → **Programs** → **MiKTeX** → **MiKTeX Options**.
2. The MiKTeX Options window opens. Click **Update Now** to refresh the formal files.

3.5.2 Defining New Format Files

NOTE

Defining new format files is a task for experienced TeX users.

MiKTeX Options can assist you in defining a new format:

1. Click **Start** → **Programs** → **MiKTeX** → **MiKTeX Options**.
2. The MiKTeX Options window opens.
3. Click on the **TeX Formats** tab. You are presented with a list of known TeX formats. To add an entry to this list, click **New...**.
4. In the **Format Definition** dialog box, enter the following information:

   Format name
   The name of the format.

   Compiler
   The TeX compiler variant (engine) which creates the format file.

   Input file
   The name of the main input file.

   Output file
   The name of the format file.

   Preloaded format
   Optional: The name of another format, which must be loaded before the actual format file is created.

   Descriptioin
   A one-line comment which describes the new format.

A new application file with the name of the format will be installed in the MiKTeX bin directory. This application file serves as a short-cut for *compiler* "&*format*". For example, these two commands are equivalent:

```
latex sample2e
etex "&latex" sample2e
```

3.6 Regional Settings

3.6.1 Paper Size

The setup process configures all programs to use A4 as the default paper format. If this doesn't fit your needs, you have to edit configuration settings for the following programs:

- Dvipdfm (see Section 3.8)
- Dvipdfmx (see Section 3.8)
- Dvips (see Section 3.9)
- pdfTEX (see Section 3.10)

3.6.2 Selecting Hyphenation Tables

You can control the loading of hyphenation tables with the help of MiKTEX Options:

1. Click **Start** → **Programs** → **MiKTeX** → **MiKTeX Options**.
2. The MiKTEX Options window opens. Click on the **Languages** tab.
3. You will presented with the list of available languages and corresponding hyphenation tables. Mark the languages, whose hyphenation tables shall be loaded by TEX.

3.7 Editing `miktex.ini`

The MiKTEX core components read a large part of configuration settings from the file `miktex.ini` (see Appendix B).

You must edit a local version of `miktex.ini`, if you have to change MiKTEX configuration settings.

Settings in the local version of `miktex.ini` take precedence over those specified in the installed version, i.e., you can easily override settings such as `[TeX]Editor`.

For example, follow these steps if you want to edit TEX files with WinEdt:

1. Use the Explorer interface to open the directory `miktex\config` relative to the local TEXMF directory (see Section 2.4.2).
2. Create a local version of `miktex.ini`, if it doesn't yet exist: use the Explorer interface to create a new text document with the name of `miktex.ini`.
3. Open `miktex.ini` with Notepad.
4. Insert/change the following lines:

```
[TeX]
Editor=winedt "[Open('%f');SelPar(%l,7)]"
```

5. Save the file and exit Notepad.
6. Refresh the file name database (see Section 3.4).

3.8 Configuring Dvipdfm

Dvipdfm configurations settings are read from the file `config`. The Dvipdfm manual (run `texdoc dvipdfm`) describes this file.

NOTE

The configuration file for Dvipdfmx (the successor of Dvipdfm) has the name `dvipdfmx.cfg`.

You must edit a local version of `config` (resp. `dvipdfmx.cfg`), if you have to change Dvipdfm configuration settings.

Settings in the local version of `config` (resp. `dvipdfmx.cfg`) take precedence over those specified in the installed version, i.e., you can easily override settings such as the paper format. For example, follow these steps if want to change the default paper format to Letter:

1. Use the Explorer interface to open the directory `dvipdfm\config` relative to the local TEXMF directory (see Section 2.4.2). Possibly you have to create this directory, if it doesn't exist yet.
2. Create a local version of `config` (resp. `dvipdfmx.cfg`), if it doesn't yet exist: use the Explorer interface to create a new text document with the name of `config` (resp. `dvipdfmx.cfg`).
3. Open `config` (resp. `dvipdfmx.cfg`) with Notepad.
4. Insert/change the following lines:

   ```
   p letter
   ```

5. Save the file and exit Notepad.
6. Refresh the file name database (see Section 3.4).

3.9 Configuring Dvips

Dvips configurations settings are read from the file `config.ps`. The Dvips manual (run `texdoc dvips`) describes this file.

It is recommended that you edit a local version of `config.ps`, if you have to change Dvips configuration settings.

Settings in the local version of `config.ps` take precedence over those specified in the installed version, i.e., you can easily override settings such as as the default paper format. For example, follow these steps if you want to change the default paper size to Letter:

1. Use the Explorer interface to create the *local Dvips config directory*, if it doesn't exist yet. The path to this directory is `dvips\config` relative to the local TEXMF directory (see Section 2.4.2).
2. Create a local version of `config.ps`, if it doesn't yet exist:
   (a) Use the Explorer interface to locate the installed version of `config.ps`. It can be found in the directory `dvips\config` relative to the installation directory (see Section 2.4.1).
   (b) Copy the installed version of `config.ps` into the local Dvips config directory.
3. Open the local version of `config.ps` with Notepad.
4. Select the desired paper size definition and cut it out. For example, cut out the following lines, if you want to use the Letter paper format:

   ```
   @ letterSize 8.5in 11in
   ```

5. Insert the Clipboard contents (the desired paper size definition) before the first paper size definition, i.e., the first line starting with `@`.

6. Save the file and exit Notepad.
7. Refresh the file name database (see Section 3.4).

3.10 Configuring pdfTEX

pdfTEX configurations settings are read from the file `pdftex.cfg` when the pdfTEX format file is being created. See Appendix C, for details about this file.

You must edit a local version of `pdftex.cfg`, if you have to change pdfTEX configuration settings.

Settings in the local version of `pdftex.cfg` take precedence over those specified in the installed version, i.e., you can easily override settings such as the paper format. For example, follow these steps if want to change the default paper format to Letter:

1. Use the Explorer interface to open the directory `pdftex\config` relative to the local TEXMF directory (see Section 2.4.2). Possibly you have to create this directory, if it doesn't exist yet.
2. Create a local version of `pdftex.cfg`, if it doesn't yet exist: use the Explorer interface to create a new text document with the name of `pdftex.cfg`.
3. Open `pdftex.cfg` with Notepad.
4. Insert/change the following lines:

```
page_height 11 true in
page_width 8.5 true in
```

5. Save the file and exit Notepad.
6. Refresh the file name database and create the pdfTEX format files (see Section 3.4).

3.11 Outline Fonts

Information about outline fonts is stored in a file by the name of `psfonts.map`. This file is created in the course of the setup/update process. It can be manually created by running

```
initexmf --mkmaps
```

at the command prompt.

> CAUTION
>
> The contents of `psfonts.map` should never be edited: it will be overwritten by the MiKTEX update process.

`psfonts.map` depends on the file `updmap.cfg`. This configuration file contains declarative instructions (see Appendix D), which will be used to build `psfonts.map`.

3.11.1 Adding `updmap.cfg` Instructions

You must edit a local version of `updmap.cfg`, if you want to add instructions (e.g., add new map files entries).

Instructions in the local version of `updmap.cfg` take precedence over those specified in the main version, i.e., you can easily override options such as `dvipsPreferOutline`.

For example, follow these steps if you want to add an entry for the map file `xyz.map`:

1. Use the Explorer interface to open the directory `miktex\config` relative to the local TEXMF directory (see Section 2.4.2).
2. Create a local version of `updmap.cfg`, if it doesn't yet exist: use the Explorer interface to create a new text document with the name of `updmap.cfg`.
3. Open `updmap.cfg` with Notepad.
4. Insert the following line:

   ```
   Map xyz.map
   ```

5. Save the file and exit Notepad.
6. Refresh the file name database (see Section 3.4.
7. Run **initexmf –mkmaps** to rebuild `psfonts.map`.

Chapter 4

Using MiKTEX

4.1 Getting Started

If you have never used TEX before: we recommend that, first of all, you work through a TEX/LATEX tutorial. A good starting point is this this entry in the UK TEX FAQ: <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=tutorials>.

MiKTEX doesn't differ very much from any other TEX system you might have used before. Typesetting with MiKTEX involves these steps:

1. Edit the LATEX source with your favourite text document editor.
2. Compile the LATEX source into a DVI file, i.e., say something like `latex MyMastersThesis`.
3. Open the result by double-clicking the DVI file (e.g., `MyMastersThesis.dvi`) in Windows Explorer.

You usually use a LATEX editor to carry out these steps. The most prominent ones are listed here: <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=editors>.

4.2 TEX & Friends Specialities

This section describes features that were added to the MiKTEX implementation of TEX & Friends.

4.2.1 Automatic Package Installation

All MiKTEX programs can be configured in such a way that missing packages are automatically installed (see Section 3.2.3).

It is possible to override the global configuration setting with these command line options:

`-disable-installer`
: Missing packages will not be installed.

`-enable-installer`
: Missing packages will be installed.

4.2.2 Finding out Package Usages

The command line option `-record-package-usages` can be used to find out which packages are used in a job.

For example, you would say

```
latex -record-package-usages=packages.txt test
```

to create the file `packages.txt`, which contains the names of the packages used by `test.tex`.

If `test.tex` looks like this:

```
\documentclass{scrartcl}
\begin{document}
Hello, world!
\end{document}
```

Then the resulting `packages.txt` would contain these lines:

```
cm
koma-script
ltxbase
```

The package list can be handed over to the package manager (see Section A.9), e.g.

```
mpm --update-some=packages.txt
```

would ensure that you have the latest versions installed.

4.2.3 Suppressing Screen Output

The option `-quiet` suppresses all diagnostic messages. No screen output is produced, unless there are errors. The `-quiet` option implies `-c-style-errors` and `-interaction=batchmode`, i.e. errors will be shown in a "C style form" and do not stop the compilation process.

For example, the input file `foo.tex`

```
\documentclass{article}
\begin{document}
What's \This?
\end{documnt}
```

would cause TEX to print one error message, as in the following example:

```
> latex -quiet foo.tex
foo.tex:3: Undefined control sequence
>
```

4.2.4 Setting the Name of the Output File

You can change the name of all output files by using the option `-job-name=`*name*. This switch actually sets the name of the TEX job and has an effect of the output file names, because these names are derived from the job name. Look at the following example:

```
> latex -job-name=foo sample2e
This is TeX, Version 3.14159 (MiKTeX 2.2)
(D:\texmf\tex\latex\base\sample2e.tex
LaTeX2e <2001/06/01>
Babel <v3.7h> and hyphenation patterns for english, german, ngerman, loaded.
(D:\texmf\tex\latex\base\article.cls
Document Class: article 2001/04/21 v1.4e Standard LaTeX document class
(D:\texmf\tex\latex\base\size10.clo))
No file foo.aux.
(D:\texmf\tex\latex\base\omscmr.fd) [1] [2] [3] (foo.aux) )
Output written on foo.dvi (3 pages, 7256 bytes).
Transcript written on foo.log.
>
```

Note the altered output file names: `foo.aux`, `foo.dvi` and `foo.log`.

4.2.5 Auto-insertion of Source Specials

4.2.5.1 What Are Source Specials?

Source specials are pieces of information embedded in a DVI file. They make a connection between the source file location (e.g., “line 100 in `foo.tex`”) and the DVI location (e.g., “page 2 in `foo.dvi`”). Source specials can improve the edit-compile-view-edit cycle:

1. You edit the source file with a TEX editor.
2. You compile the source file.
3. You execute a special editor command to open the previewer Yap, going directly to the page that corresponds to the cursor location in your editor window.
4. You navigate through the viewed document.
5. You double-click somewhere inside the viewed document; this causes Yap to bring the editor window back to the front, moving the text cursor directly to the line that corresponds to the view location.

4.2.5.2 How to Insert Source Specials

The TEX compiler option `-src-specials` directs TEX to insert source specials into the DVI file.

You would say

```
latex -src-specials foo.tex
```

to create the DVI file `foo.dvi` with embedded source specials.

4.2.6 Quoted File Names

The TEX compiler can handle quoted file names. This makes it possible to specify long file names that contain spaces.

For example, to compile the input file `long file name.tex`, you start TEX as follows:

```
latex "long file name"
```

This produces the DVI file `"long file name.dvi"`. The log file is named `"long file name.log"`.

You can, to some extent, use quoted file names inside the TEX document. For example:

```
\input{"extra long file name"}
```

This would cause TEX to read the file `"extra long file name.tex"`.

Things get a little bit complicated if you want to use the LATEX primitive `\include`. You have to write something like the following:

```
\include{"extra\space long\space file\space name"}
```

4.2.7 Specifying Additional Input Directories

The option `-include-directory=`*`dir`* allows you to extend the input search path for one invocation of TEX.

For example:

```
tex -include-directory="C:\My TeX" foo.tex
```

This prepends `"C:\My TeX"` to the input search path, i.e., `"C:\My TeX"` will be searched first, when TEX looks out any input file (including `foo.tex`).

You can specify either absolute paths (as in the example above) or relative paths.

4.2.8 Specifying the Output Directory

The option `-output-directory=`*`dir`* causes TEX to create all output files in another directory.

For example:

```
> mkdir C:\texoutput
> latex -output-directory=C:\texoutput sample2e.tex
...
>
```

This ensures that all output files (`foo.dvi`, `foo.log`, `...`) will be created in `C:\texoutput\`.

4.2.9 Specifying the Directory for Auxiliary Files

The option `-aux-directory=`*`dir`* causes TEX to create auxiliary files in another directory. For example:

```
> mkdir C:\texoutput
> mkdir C:\tobedeleted
> latex -output-directory=C:\texoutput -aux-directory=C:\tobedeleted foo.tex
...
>
```

This ensures that 1) `foo.dvi` will be created in `C:\texoutput\` and 2) all other files (`foo.log`, `...`) will be created in `C:\tobedeleted\`..

4.2.10 Running Programs From Within TEX

TEX handles output stream `18` in a special way: the token list is interpreted as a command line. If the \write18 feature is enabled (see below), then \write18{*toklist*} starts the command interpreter (usually **cmd.com**) to carry out the command specified by *toklist*. For example:

```
\write18{dir}
```

lists the files and sub-directories of the current directory.

TEX ignores \write18 by default (for security reasons). You enable the feature by using the TEX compiler option `-enable-write18`.

4.2.11 TCX Files: Character Translations

This section is "borrowed" from the Web2C manual.

TCX (TEX character translation) files help TEX support direct input of 8-bit international characters if fonts containing those characters are being used. Specifically, they map an input (keyboard) character code to the internal TEX character code (a superset of ASCII).

Of the various proposals for handling more than one input encoding, TCX files were chosen because they follow Knuth's original ideas for the use of the `xchr` and `xord` tables. He ventured that these would be changed in the WEB source in order to adjust the actual version to a given environment. It turned out, however, that recompiling the WEB sources is not as simple task as Knuth predicted; therefore, TCX files, providing the possibility of changing of the conversion tables on on-the-fly, has been implemented instead.

This approach limits the portability of TEX documents, as some implementations do not support it (or use a different method for input-internal reencoding). It may also be problematic to determine the encoding to use for a TEX document of unknown provenance; in the worst case, failure to do so correctly may result in subtle errors in the typeset output.

While TCX files can be used with any format, using them breaks the LATEX `inputenc` package. This is why you should either use *tcxfile* or *inputenc* in LATEX input files, but never both.

This is entirely independent of the MLTeX extension: whereas a TCX file defines how an input keyboard character is mapped to TEX's internal code, MLTeX defines substitutions for a non-existing character glyph in a font with a \accent construction made out of two separate character glyphs. TCX files involve no new primitives; it is not possible to specify that an input (keyboard) character maps to more than one character.

Specifying TCX files:

- You can specify a TCX file to be used for a particular TEX run by specifying the command-line option `-translate-file=`*`tcxfile`* or (preferably) specifying it explicitly in the first line of the main document:

  ```
  %& -translate-file=tcxfile
  ```

- TCX files are searched for along the `TCXPath` path.
- **initex** ignores TCX files.

MiKTEX comes with at least two TCX files, `il1-t1.tcx` and `il2-t1.tcx`. These support ISO Latin 1 and ISO Latin 2, respectively, with Cork-encoded fonts (a.k.a.: the T1 encoding). TCX files for Czech, Polish, and Slovak are also provided.

Syntax of TCX files:

1. Line-oriented. Blank lines are ignored.
2. Whitespace is ignored except as a separator.
3. Comments start with % and continue to the end of the line.
4. Otherwise, a line consists of one or two character codes:

   ```
   src [dest]
   ```

5. Each character code may be specified in octal with a leading `0`, hexadecimal with a leading `0x`, or decimal otherwise. Values must be between `0` and `255`, inclusive (decimal).
6. If the *`dest`* code is not specified, it is taken to be the same as *`src`*.
7. If the same *`src`* code is specified more than once, it is the last definition that counts.

Finally, here's what happens: when TEX sees an input character with code *`src`*: it 1) changes *`src`* to *`dest`*; and 2) makes code the *`dest`* "printable", i.e., printed as-is in diagnostics and the log file instead of in `^^` notation.

By default, no characters are translated, and character codes between `32` and `126` inclusive (decimal) are printable. It is not possible to make these (or any) characters unprintable.

Specifying translations for the printable ASCII characters (codes `32`–`127`) will yield unpredictable results. Additionally you shouldn't make the following characters printable: `^^I` (TAB), `^^J` (line feed), `^^M` (carriage return), and `^^?` (delete), since TEX uses them in various ways.

Thus, the idea is to specify the input (keyboard) character code for *`src`*, and the output (font) character code for *`dest`*.

4.3 texify: The MiKTEX Compiler Driver

texify is a command line utility that simplifies the creation of DVI (PDF) documents: **texify** automatically runs LATEX (pdfLATEX), MakeIndex and BibTEX as many times as necessary to produce a DVI (PDF) file with sorted indices and all cross-references resolved. To run **texify** on an input file `foo.tex`, do this:

```
texify foo.tex
```

As shown in the example above, the input file names to **texify** must include any extension (`.tex`, `.ltx`, ...).

There are several command line options you can use to control **texify** (see Section A.15). Here are some examples:

```
texify --clean foo.tex
```

All auxiliary files will be removed, i.e., only the output `foo.dvi` file will be left in the current folder.

```
texify --tex-opt=--src foo.tex
```

Passes the option `-src` to the TEX compiler.

```
texify --run-viewer foo.tex
```

Opens the output file `foo.dvi` (unless there are compile erros).

```
texify --tex-opt=--src --viewer-opt="-1 -s\"200 foo.tex\"" --run-viewer foo.tex
```

Compiles `foo.tex` with source file information (`-src`) and then initiates forward DVI search to open `foo.dvi` at the source special location “200 foo.tex”. The previewer option `-1` re-uses an existing previewer window.

See the Yap manual, for a complete list of previewer options.

4.4 mtprint The MiKTEX Print Utility

You can use the MiKTEX Print Utility to send TEX output files (`*.dvi`) to a printing device.

The MiKTEX Print Utility is started in the command prompt window. To print the DVI file `foo.dvi`, do this:

```
mtprint foo.dvi
```

Printing works as follows:

1. The DVI file is converted by Dvips into an intermediate PostScript file.
2. The PostScript file is then processed by Ghostscript to produce a series of Windows Bitmaps.
3. These bitmaps are then sent to the printer.

If you have a PostScript printer, then you can speed up the process by using using the `-print-method` option:

```
mtprint --print-method=ps foo.dvi
```

This will omit steps 2 and 3, i.e., the intermediate PostScript file will be sent directly to the printer.

Appendix A

Manual Pages

This chapter contains manual pages for various programs. Only those programs are included which have non-standard features built in. Use the **texdoc** utility, to find documentation for programs not listed here.

A.1 bibtex

A.1.1 Synopsis

```
bibtex [-alias=app] [-disable-installer] [-enable-installer] [-help] [-hhelp]
     [-include-directory=dir] [-min-crossrefs=n] [-quiet]
     [-record-package-usages=file] [-trace=traceflags] [-version] [auxname]
```

A.1.2 Description

bibtex reads the top-level auxiliary (`.aux`) file that was output during the running of **latex** or **tex** and creates a bibliography (`.bbl`) file that will be incorporated into the document on subsequent runs of LaTeX or TeX. The *auxname* on the command-line must be given without the `.aux` extension. If you don't give the *auxname*, the program prompts you for it.

bibtex looks up, in bibliographic database (`.bib`) files specified by the \bibliography command, the entries specified by the \cite and \nocite commands in the LaTeX or TeX source file. It formats the information from those entries according to instructions in a bibliography style (`.bst`) file (specified by the \bibliographystyle command, and it outputs the results to the `.bbl` file.

The LaTeX reference manual explains what a LaTeX source file must contain to work with **bibtex**. Appendix B of the manual describes the format of the `.bib` files. The *BibTeXing* document describes extensions and details of this format, and it gives other useful hints for using **bibtex**.

A.1.3 Options

`-alias=app`
: Pretend to be *app*. This affects both the format used and the search paths.

`-disable-installer`
: Disable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTeX Options (see Section 3.2.3).

`-enable-installer`
: Enable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTeX Options (see Section 3.2.3).

`-help`
Give help and exit.

`-hhelp`
Show the manual page in an HTML Help window and exit when the window is closed.

`-include-directory=`*`dir`*
Prepend *`dir`* to the search path.

`-min-crossrefs=`*`n`*
Defines the minimum number of **crossref**s required for automatic inclusion of the crossref'd entry on the citation list; the default is two.

`-quiet`
Suppress all output, except errors.

`-record-package-usages=`*`file`*
Record all package usages and write them into *`file`*.

`-trace=`*`traceflags`*
Write trace messages into the DebugView window. The *`traceflags`* argument is a comma-separated list of trace categories:

`access`
Accesses to disk files.

`config`
Retrieval of configuration settings.

`error`
Error conditions.

`filesearch`
File search.

`fndb`
File name database.

`fontinfo`
Font information.

`open`
File openings

`process`
Process invocations.

`tempfile`
Temporary files.

`-version`
Show version information and exit.

A.1.4 See Also

Section 4.3

A.1.5 Documentation

BibTEXing
Run `texdoc btxdoc`

Designing BibTEX Styles
Run `texdoc btxhak`

LaTeX: A Document Preparation System
ISBN 0-201-52983-1

A.2 dvicopy

A.2.1 Synopsis

`dvicopy [-alias=`*app*`] [-disable-installer] [-enable-installer] [-help] [-hhelp]`
`[-include-directory=`*dir*`] [-mag=`*mag*`] [-max-pages=`*n*`] [-page-start=`*page-spec*`]`
`[-record-package-usages=`*file*`] [-select=`*range*`] [-trace=`*traceflags*`] [-version]`
indvi outdvi

A.2.2 Description

dvicopy reads a DVI file, expands any references to virtual fonts to base fonts, and writes the resulting DVI file. Thus you can use virtual fonts even if your DVI processor does not support them, by passing the documents through **dvicopy** first.

A.2.3 Options

`-alias=`*app*
Pretend to be *app*. This affects both the format used and the search paths.

`-disable-installer`
Disable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTeX Options (see Section 3.2.3).

`-enable-installer`
Enable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTeX Options (see Section 3.2.3).

`-help`
Give help and exit.

`-hhelp`
Show the manual page in an HTML Help window and exit when the window is closed.

`-include-directory=`*dir*
Prepend *dir* to the search path.

`-mag=`*mag*
Override existing magnification with *mag*.

`-max-pages=`*n*
Process *n* pages; default one million. This option cannot be used together with `-select`.

`-page-start=`*page-spec*
Start at *page-spec*, for example 2 or 5.*.-2. This option cannot be used together with `-select`.

`-record-package-usages=`*file*
Record all package usages and write them into *file*.

`-select=`*sel*
Select pages to be copied.

The syntax for *sel* is: *start* `[`*n*`]`, where *start* is the starting page specification (for example `2` or `5.*.-2`) and *n* (optional) is the maximum number of pages to be copied.

You can use up to `10 -select` options. This option cannot be used together with `-max-pages` or `-page-start`.

`-trace=`*traceflags*
: Write trace messages into the DebugView window. The *traceflags* argument is a comma-separated list of trace categories:

  `access`
  : Accesses to disk files.

  `config`
  : Retrieval of configuration settings.

  `error`
  : Error conditions.

  `filesearch`
  : File search.

  `fndb`
  : File name database.

  `fontinfo`
  : Font information.

  `open`
  : File openings

  `process`
  : Process invocations.

  `tempfile`
  : Temporary files.

`-version`
: Show version information and exit.

A.3 dvips

A.3.1 Synopsis

`dvips [-a] [-A] [-b` *num*`] [-B] [-c` *num*`] [-C` *num*`] [-d` *num*`] [-D` *num*`] [-e` *num*`] [-E] [-f] [-F] [-G] [-h` *name*`] [-i] [-I`*imageoptions*`] [-k] [-K] [-l` *num*`] [-m] [-M] [-n` *num*`] [-N] [-o` *name*`] [-O` *offset*`] [-p` *num*`] [-pp` *pagelist*`] [-P` *printername*`] [-q] [-r] [-R] [-s] [-S` *num*`] [-t` *papertype*`] [-T` *offset*`] [-u` *name*`] [-U] [-V] [-x` *num*`] [-X` *num*`] [-y` *num*`] [-Y` *num*`] [-z] [-Z]` *dvifile*

A.3.2 Description

dvips takes a DVI file produced by **tex** (or by some other processor such as **gftodvi** and converts it to PostScript. The DVI file may be specified without the `.dvi` extension.

A.3.3 Options

Many of the parameterless options listed here can be turned off by suffixing the option with a zero (`0`); for instance, to turn off page reversal, use `-r0`. Such options are marked with a trailing `*`.

`-a*` Conserve memory by making three passes over the DVI file instead of two and only loading those characters actually used.

`-A` Print only the odd pages. This option uses TEX page numbers, not physical page numbers.

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

`-B` Print only the even pages. This option uses TEX page numbers, not physical page numbers.

`-c` *num*
Generate *num* consecutive copies of every page, i.e., the output is uncollated. This merely sets the builtin PostScript variable ***/#copies***.

`-C` *num*
Generate *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 debug flags, showing what Dvips (thinks it) is doing. See the Dvips manual, for the possible values of *num*. Use `-d -1` as the first option for maximum output.

`-D` *num*
Set both the horizontal and vertical resolution to *num*, given in dpi (dots per inch). 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. If you are using fonts made with METAFONT, such as Computer Modern, **makepk** needs to know about the value for *num* that you use or METAFONT will fail. See the file `modes.mf` for a list of resolutions and mode names for most devices.

`-e` *num*
Maximum drift in pixels of each character from its 'true' resolution-independent position on the page. The default value of this parameter is resolution dependent (it is the number of entries in the list [100, 200, 300, 400, 500, 600, 800, 1000, 1200, 1600, 2000, 2400, 2800, 3200, ...] that are less than or equal to the resolution in dots per inch). 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*` Generate an EPSF file with a tight bounding box. This 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 print 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 enough for creating small EPSF files for equations or tables or the like. (Of course, **dvips** output, especially when using bitmap fonts, 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 care.) For multiple page input files, also specify `-i` to get each page as a separate EPSF file; otherwise, all the pages are overlaid in the single output file.

`-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 your input must be a pipe, write a shell script that copies the pipe output to a temporary file and then points **dvips** at this file. It 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 the `-f` to send it anyway.

`-F*` Write control-D (ASCII code 4) as the very last character of the PostScript file. This is useful when **dvips** is driving the printer directly instead of working through a spooler, as is common on personal systems. On systems shared by more than one person, this is not recommended.

`-G` Shift low chars to higher pos.

`-h` *name*
Prepend *name* as an additional header file, or, if *name* is `-`, suppress all header files. Any definitions in the header file get added to the PostScript `userdict`.

`-i*` Make each section be a separate file; a *section* is a part of the document processed independently, most often created to avoid memory overflow. The filenames 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; if `-i` is specified and `-S` is not, each page is output as a separate file. 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.

`-I` *imageoptions*
Specify image options:

`1`, `2`, `3`
Select PostScript level 1, 2 or 3.

`c`, `g`
Use `c` if you have a color printer or `g` for conversion to grayscale. Color printing requires PostScript level 2 or higher.

`f`, `r`, `8`, `h`
Use `f` to get flate encoding (requires PostScript level 3), `r` to get run-length-encoding (requires PostScript level 2), `8` to get ASCII85-encoding instead ASCII-Hex-encoding (requires PostScript level 2) or `h` to use ASCII-Hex-encoding.

Flate encoding, run-length-encoding and one from ASCII85- or ASCII-Hex-encoding can be used combined.

`d` Use `d` to turn draft mode on. Bitmap images are not printed, only the place is marked.

`a`, `o`, `t`, `l`, `m`, `s`,
To convert an alpha channel into an EPS level 3 masked bitmap use the `a` option. By use of `o` you can specify the alpha channel expresses opacity (default), `t` specifies transparency. Normally only pixels with 0 opacity are masked, all others are drawn. The alternative behaviour is to draw only pixels with full opacity and mask all others, this can be reached by option `l`.

Option `m` advices the program to mix foreground and background color for a pixel depending on its alpha value.

You can specify a background color like `128,255,128` for light green. The color specification must appar after the `a` option. Normally this background color is used only if there is no background color chunk in the file. Option `s` gives this command line background color higher priority than the background color from chunk.

`-j*` Download only needed characters from Type 1 fonts. This is the default. Some debugging flags trace this operation. You can also control partial downloading on a per-font basis (by editing `updmap.cfg`). See Section 3.11.

`-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. This works by downloading `crop.pro`.

`-K*` Remove comments in included PostScript graphics, font files, and headers; only 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 other graphics to fail, however, since the PostScript header macros from some software packages read portion the input stream line by line, searching for a particular comment.

`-l [=]`*num*
The last page printed will be the first one numbered *num*. Default is the last page in the document. If *num* is prefixed by an equals sign, then it (and the argument to the `-p` option, if specified) is treated as a physical (absolute) page number, rather than a value to compare with the TEX \count0 values stored in the DVI file. 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, if supported by the output device.

`-M*` Turns off automatic font generation.

`-n` *num*
Print at most *num* pages. Default is 100000.

`-N*` Turns off generation of structured comments such as **%%Page**; this may be necessary on some systems that try to interpret PostScript comments in weird ways, or on some PostScript printers. Beware: This also disables page movement, etc., in PostScript viewers such as GSview.

`-o` *name*
Send output to the file *name*. If `-o` is specified without *name*, the default is *file*`.ps` where the input DVI file was *file*`.dvi`. If `-o` isn't given at all, the configuration file default is used.

If *name* is `-`, output goes to standard output. If the first character of *name* is `!` or |, 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 as usual. **dvips** will print to the local printer device `PRN` when *name* is |`lpr` and a program by that name cannot be found.

`-o` turns off the automatic sending of control-D. See the `-f` option for how to override this.

`-O` *x-offset*`,`*y-offset*
Move the origin by *x-offset*,*y-offset*, a comma-separated pair of dimensions such as `.1in,-.3cm`. 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. This is usually best specified in the printer-specific configuration file.

This is useful for a printer that consistently offsets output pages by a certain amount. You can use the file `testpage.tex` to determine the correct value for your printer. Be sure to do several runs with the same `O` value-some printers vary widely from run to run.

If your printer offsets every other page consistently, instead of every page, your best recourse is to use **bop-hook** (see the Dvips manual for more information).

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

`-pp` *first-last*
Print pages *first* through *last*; equivalent to `-p` *first* `-l` *last*, except that multiple `-pp` options accumulate, unlike `-p` and `-l`. The `-` separator can also be `:`.

`-P` *printer*
Read the configuration file `config.`*printer*, which can set the output name (most likely `o |lpr -P`*printer*), resolution, METAFONT mode, and perhaps font paths and other printer-specific defaults. It works best to put sitewide defaults in the one master `config.ps` file and only things that vary printer to printer in the `config.`*printer* files; `config.ps` is read before `config.`*printer*.

`-q*` Run quietly. Don't chatter about pages converted, etc. to standard output; report no warnings (only errors) to standard error.

`-r*` Output pages in reverse order. By default, page 1 is output first.

`-R` Run securely. This disables shell command execution in \special (via `‘`) and config files (via the `E`), pipes as output files, and opening of any absolute filenames.

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

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

`-t` *papertype*
Set the paper type to *papertype*, usually defined in one of the configuration files, along with the appropriate PostScript code to select it. You can also specify a *papertype* of `landscape`, which rotates a document by 90 degrees. To rotate a document whose paper type is not the default, you can use the `-t` option twice, once for the paper type, and once for `landscape`.

`-T` *hsize,vsize*
Set the paper size to (*hsize*,*vsize*), a comma-separated pair of dimensions such as `.1in,-.3cm` . It overrides any paper size special in the DVI file.

`-u` *name*
Examine *name* for PostScript font aliases. Default is `psfonts.map`. This option allows you to specify different resident fonts that different printers may have. If *name* starts with a `+` character, then the rest of the name (after any leading spaces) is used as an additional map 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, which has a bug that puts garbage on the bottom of each character. Not recommended unless you must drive this printer.

`-V*` Download non-resident PostScript fonts as bitmaps. This requires use of `makepk` to generate the required bitmap fonts. The bitmap must be put into `psfonts.map` as the downloadable file for that font. This is useful only for those fonts for which you do not have real outlines, being downloaded to printers that have no resident fonts, i.e., very rarely.

`-x` *num*
Set the `x` magnification ratio to *num*/1000. Overrides the magnification specified in the DVI file. Must be between 10 and 100000. It is recommended that you use standard magstep values (1095, 1200, 1440, 1728, 2074, 2488, 2986, and so on) to help reduce the total number of PK files generated. *num* may be a real number, not an integer, for increased precision.

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

`-y` *num*
Set the y magnification ratio to *num*/1000. See `-x` above.

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

`-z*` Pass `html` hyperdvi specials through to the output for eventual distillation into PDF. This is not enabled by default to avoid including the header files unnecessarily, and use of temporary files in creating the output.

`-Z*` Compress bitmap fonts in the output file, thereby reducing the size of what gets downloaded. Especially useful at high resolutions or when very large fonts are used. May slow down printing, especially on early 68000-based PostScript printers. Generally recommend today, and can be enabled in the configuration file.

A.3.4 Documentation

Dvips: A DVI-to-PostScript Translator
Run `texdoc dvips`

A.4 etex

A.4.1 Synopsis

`etex [-alias=`*app*`] [-aux-directory=`*dir*`] [-buf-size=`*n*`] [-c-style-errors]`
`[-disable-installer] [-enable-installer] [-enable-write18] [-error-line=`*n*`]`
`[-font-max=`*n*`] [-font-mem-size=`*n*`] [-half-error-line=`*n*`] [-halt-on-error] [-help]`
`[-hhelp] [-include-directory=`*folder*`] [-initialize] [-interaction==`*mode*`]`
`[-job-name=`*name*`] [-job-time=`*file*`] [-max-in-open=`*n*`] [-max-print-line=`*n*`]`
`[-max-strings=`*n*`] [-mem-bot=`*n*`] [-mem-max=`*n*`] [-mem-min=`*n*`] [-mem-top=`*n*`]`
`[-nest-size=`*n*`] [-output-directory=`*folder*`] [-param-size=`*n*`] [-pool-size=`*n*`]`
`[-quiet] [-record-package-usages=`*file*`] [-recorder] [-save-size=`*n*`] [-src-specials]`
`[-stack-size=`*n*`] [-string-vacancies=`*n*`] [-terminal=oem] [-time-statistics]`
`[-trace=`*traceflags*`] [-trie-op-size=`*n*`] [-trie-size=`*n*`] [-undump=`*fmtname*`]`
`[-version] [`*file*`] [`*command* | *file*`]`

A.4.2 Description

ε-TEX is the first concrete result of an international research & development project, the $\mathcal{NTS}$ Project, which was established under the aegis of DANTE e.V. during 1992. The aims of the project are to perpetuate and develop the spirit and philosophy of TEX, whilst respecting Knuth's wish that TEX should remain frozen.

ε-TEX can be used in two different modes: in compatibility mode it is supposed to be completely interchangable with standard TEX. In extended mode several new primitives are added that facilitate (among other things) bidirectional typesetting.

An extended mode format is generated by prefixing the name of the source file for the format with an asterisk (*). Such formats are often prefixed with an **e**, hence **etex** as the extended version of **tex** and **elatex** as the extended version of **latex**. (However, **eplain** is an exception to this rule.)

The **einitex** and **evirtex** commands are ε-TEX's analogues to the **initex** and **virtex** commands.

ε-TEX's handling of its command-line arguments is similar to that of TEX.

A.4.3 Options

`-alias=`*app*
Pretend to be *app*. This affects both the format used and the search paths.

`-aux-directory=`*dir*
Keep auxiliary files in *dir*. This implies `-include-directory=`*dir*.

`-buf-size=`*n*
Set the internal compiler variable `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.

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

`-disable-installer`
Disable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-enable-installer`
Enable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-enable-write18`
Enable the \write18 construct (see Section 4.2.10).

`-error-line=`*n*
Set the internal compiler variable `error_line` to *n*.

`error_line` is the width of context lines on terminal error messages.

`-font-max=`*n*
Set the internal compiler variable `font_max` to *n*.

`font_max` is the maximum internal font number; must not exceed `5000`.

`-font-mem-size=`*n*
Set the internal compiler variable `font_mem_size` to *n*.

`font_mem_size` is the size, in TEX memory words, of the font memory.

`-half-error-line=`*n*
Set the internal compiler variable `half_error_line` to *n*.

`half_error_line` is the width of first lines of contexts in terminal error messages.

`-halt-on-error`
Quit after the first error.

`-help`
Give help and exit.

`-hhelp`
Show the manual page in an HTML Help window and exit when the window is closed.

`-include-directory=`*dir*
Prepend *dir* to the search path.

`-initialize`
Become the *INI* variant of the compiler.

`-interaction=`*mode*
Set the interaction mode. Must be one of `batchmode`, `nonstopmode`, `scrollmode` and `errorstopmode`. The meaning of these modes is the same as the corresponding commands.

`-job-name=`*name*
Set the name of the job (\jobname. This has an affect on the output file names.

`-job-time=`*file*
Set the time-stamp of all output files equal to *file*'s time-stamp.

`-max-in-open=`*n*
Set the internal compiler variable `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 compiler variable `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 compiler variable `max_strings` to *n*.

`max_strings` is the maximum number of strings.

`-mem-bot=`*n*
Set the internal compiler variable `mem_bot` to *n*.

`mem_bot` is the smallest index in the internal memory array dumped by the *INI* variant of the compiler; must not be less than `mem_min`.

`-mem-max=`*n*
Set the internal compiler variable `mem_max` to *n*. `mem_max` is the greatest index in the internal memory array.

`-mem-min=`*n*
Set the internal compiler variable `mem_min` to *n*. `mem_min` is the smallest index in the internal memory array; must be `0` or more; must be equal to `mem_bot` in the *INI* variant of the compiler, otherwise less than or equal to `mem_bot`}.

`-mem-top=`*n*
Set the internal compiler variable `mem_top` to *n*.

`mem_top` is the largest index in the internal memory array dumped by the *INI* variant of the compiler; must be substantially larger than `0` and not greater than `mem_max`.

`-nest-size=`*n*
Set the internal compiler variable `nest_size` to *n*.

`nest_size` is the maximum number of semantic levels simultaneously active.

`-output-directory=`*dir*
Create output files in *dir*. This implies `-include-directory=`*dir*.

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

`-pool-size=`*n*
Set the internal compiler variable `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`.

`-quiet`
Suppress all output, except errors.

`-record-package-usages=`*file*
Record all package usages and write them into *file*.

`-recorder`
Enable the file name recorder. This leaves a trace of the files opened for input and output in a file with the extension `.fls`.

`-save-size=`*n*
Set the internal compiler variable `save_size` to *n*. `save_size` is the amount of space for saving values outside of current group.

`-src-specials`
Embed source file information (source specials) in the DVI file.

`-stack-size=`*n*
Set the internal compiler variable `stack_size` to *n*.

`stack_size` is the maximum number of simultaneous input sources.

`-string-vacancies=`*n*
Set the internal compiler variable `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 compiler's own error messages are stored.

`-tcx=`*name*
Process the TCX table *name*. See Section 4.2.11, for a discussion of TCX tables.

`-terminal=oem`
Use the active code page (e.g., 437) for console output.

`-time-statistics`
Show processing time statistics.

`-trace=`*traceflags*
Write trace messages into the DebugView window. The *traceflags* argument is a comma-separated list of trace categories:

`access`
Accesses to disk files.

`config`
Retrieval of configuration settings.

`error`
Error conditions.

`filesearch`
File search.

`fndb`
File name database.

`fontinfo`
Font information.

`open`
File openings

`process`
Process invocations.

`tempfile`
Temporary files.

`-trie-op-size=`*n*
Set the internal compiler variable `trie_op_size` to *n*.

`trie_op_size` is the amount of space for “opcodes” in the hyphenation patterns.

`-trie-size=`*n*
Set the internal compiler variable `trie_size` to *n*.

`trie_size` is the amount of space for hyphenation patterns; should be larger for the *INI* variant of the compiler.

`-undump=`*name*
Use *name* as the name of the format to be used, instead of the name by which the program was called or a

`%&`

line.

`-version`
Show version information and exit.

A.4.4 Aliases

einitex
Equivalent to **etex -ini**.

evirtex
Equivalent to **etex**.

A.4.5 Documentation

The ε-TEX manual
Run `texdoc etex-man`

A.5 findtexmf

A.5.1 Synopsis

`findtexmf [-alias=`*app*`] [-help] [-file-type=`*filetype*`] [-must-exist]`
`[-show-path=`*filetype*`] [-start] [-version]` *file*`...`

A.5.2 Description

findtexmf can be used to find MiKTEX related files. When the `-file-type` option is not given, the search path used when looking for a file is inferred from the name given, by looking for a known extension. If no known extension is found, the search path for TEX source files is used.

A.5.3 Options

`-alias=`*app*
Pretend to be *app* when finding files.

`-help`
Give help and exit.

`-file-type=`*filetype*
Use the specified file type (see below).

`-must-exist`
Install missing packages, if necessary.

`-show-path=`*filetype*
Output search path for the specified file type (see below).

`-start`
Start the associated program, if the file was found.

`-version`
Show version information and exit.

A.5.4 File Types

afm Adobe font metric files (`*.afm`).

base
METAFONT base files (`*.base`).

bib Bibliographic database files (`*.bib`).

bst Bibliography style files(`*.bst`).

dvips config
Dvips config files (`config.*`).

enc Font encoding files (`*.enc`).

exe Executables (`*.com;*.exe;*.bat`).

fmt TEX format files (`*.fmt;*.efmt;*.eofmt`).

hbf Hanzi Bitmap Fonts (`*.hbf`).

graphic/figure
Graphics files (`*.eps;*.epsi;*.png`).

ist Index style files (`*.ist`).

map
Font mapping files (`*.map`).

mem
METAPOST memory files (`*.mem`).

mf METAFONT input files (`*.mf`).

mp METAPOST input files (`*.mp`).

ocp OCP files (`*.ocp`).

ofm Ω font metric files (`*.ofm`).

otp OTP files (`*.otp`).

ovf Ω virtual font files(`*.ovf`).

ovp OVP files (`*.ovp`).

perlscript
Perl script files (`*.pl`).

PostScript header
PostScript header files (`*.pro;*.enc`).

tcx TCX files (`*.tcx`).

tex TEX input files (`*.tex`).

TeX system documentation
Documentation files (`*.dvi;*.pdf;*.ps;*.ps;*.txt;*.chm;*.html`).

tfm TEX font metric files (`*.tfm`).

truetype fonts
TrueType font files (`*.ttc;*.ttf`).

type1 fonts
Type 1 font files (`*.pfa;*.pfb`).

vf Virtual font files (`*.vf`).

A.6 gftodvi

A.6.1 Synopsis

`gftodvi [-alias=`*app*`] [-disable-installer] [-enable-installer] [-gray-font=`*font*`]`
`[-help] [-hhelp] [-include-directory=`*dir*`] [-label-font=`*font*`] [-logo-font=`*font*`]`
`[-overflow-label-offset=`*real*`] [-record-package-usages=`*file*`] [-slant-font=`*font*`]`
`[-title-font=`*font*`] [-trace=`*traceflags*`] [-version] [`*gffile*`]`

A.6.2 Description

The **gftodvi** program converts a generic font (GF) file output by, for example, METAFONT, to a device independent (DVI) file (that can then be typeset using the same software that has already been written for). The characters in the GF file will appear one per page, with labels, titles, and annotations as specified in Appendix H (Hardcopy Proofs) of *The METAFONTbook*.

gftodvi uses other fonts in addition to the main GF file. A "gray" font is used to typeset the pixels that actually make up the character. (We wouldn't want all the pixels to be simply black, since then labels, key points, and other information would be lost.) A "title" font is used for the information at the top of the page. A "label" font is used for the labels on key points of the figure. A "slant" font is used to typeset diagonal lines, which otherwise have to be simulated using horizontal and vertical rules. The default gray, title, and label fonts are `gray`, `cmr8`, and `cmtt10`, respectively; there is no default slant font.

To change the default fonts, you can give special commands in your source file, or you can change the fonts on the command-line.

The GF file name on the command-line must be complete. (The program prompts you for it if you don't give it.) Because the resolution is part of the extension, it would not make sense to append a default extension as is done with other DVI-reading software. The output file name defaults to the same root as the GF file, with the `.dvi` extension added. For example, the input file `cmr10.2602gf` would become `cmr10.dvi`.

A.6.3 Options

`-alias=`*app*
: Pretend to be *app*. This affects both the format used and the search paths.

`-disable-installer`
: Disable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-enable-installer`
: Enable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-gray-font=`*font*
: Sets the "gray" font. Default is `gray`.

`-help`
: Give help and exit.

`-hhelp`
: Show the manual page in an HTML Help window and exit when the window is closed.

`-include-directory=`*dir*
: Prepend *dir* to the search path.

`-label-font=`*font*
: Sets the "label" font. Default is `cmtt10`.

`-logo-font=`*font*
: Sets the "logo" font. Default is `logo8`.

`-overflow-label-offset=`*real*
: Specifies the distance from the right edge of the character bounding box at which the overflow equations (if any) are typeset. The value is given in points. The default is a little over two inches.

`-record-package-usages=`*file*
: Record all package usages and write them into *file*.

`-slant-font=`*font*
: Sets the “slant” font. There is no default.

`-title-font=`*font*
: Sets the “title” font. Default is `cmr8`.

`-trace=`*traceflags*
: Write trace messages into the DebugView window. The *traceflags* argument is a comma-separated list of trace categories:

  `access`
  : Accesses to disk files.

  `config`
  : Retrieval of configuration settings.

  `error`
  : Error conditions.

  `filesearch`
  : File search.

  `fndb`
  : File name database.

  `fontinfo`
  : Font information.

  `open`
  : File openings

  `process`
  : Process invocations.

  `tempfile`
  : Temporary files.

`-version`
: Show version information and exit.

A.6.4 Documentation

The METAFONTbook
: ISBN 0-201-13444-6

A.7 initexmf

A.7.1 Synopsis

`initexmf [-dump | -dump=`*fmtname*`] [-help | -h] [-list-modes] [-local-root=`*dir*`]`
`[-mklinks] [-mkmaps] [-print-only | -n] [-quiet | -q] [-report]`
`[-root-directories=`*dirs* `| -r`*dirs*`] [-update-fndb | -u | -update-fndb=`*dir* `| -u`*dir*
`| -update-miktex] [-verbose | -v] [-version | -V]`

A.7.2 Description

initexmf is used at the command prompt to configure MiKTEX.

A.7.3 Options

`-dump`, `-dump=`*fmtname*
: Either dump all format files, or dump the specified format file.

`-list-modes`
: List all known METAFONT modes.

`-local-root=`*dir*
: Set the location of the local TEXMF directory.

`-mklinks`
: Create an executable for each known format.

`-mkmaps`
: Create the file `psfonts.map`. See Section 3.11, for more information.

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

`-quiet`, `-q`
: Suppress screen output.

`-report`
: Write a MiKTEX configuration report.

`-root-directories=`*dirs*, `-r`*dirs*
: Specify the locations of all TEXMF root directories.

`-update-fndb`, `-u`
: Refresh the whole file name database.

`-update-fndb=`*dir*, `-u`*dir*
: Refresh the file name database for a specific TEXMF tree.

`-update-miktex`
: Start MiKTEX Update Wizard.

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

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

A.8 mf

A.8.1 Synopsis

```
mf [-alias=app] [-aux-directory=dir] [-bistack-size=n] [-buf-size=n]
     [-c-style-errors] [-disable-installer] [-enable-installer] [-error-line=n]
     [-half-error-line=n] [-halt-on-error] [-help] [-hhelp] [-include-directory=dir]
     [-initialize] [-interaction=mode] [-job-name=name] [-job-time=file]
     [-lig-table-size=n] [-max-print-line=n] [-max-strings=n] [-max-wiggle=n]
     [-mem-max=n] [-mem-min=n] [-mem-top=n] [-move-size=n] [-output-directory=folder]
     [-param-size=n] [-path-size=n] [-pool-size=n] [-quiet]
     [-record-package-usages=file] [-recorder] [-screen] [-string-vacancies=n]
     [-tcx=file] [-terminal=oem] [-time-statistics] [-trace=traceflags]
     [-undump=name] [-version] [command | file]
```

A.8.2 Description

METAFONT reads the program in the specified files and outputs font rasters (in GF format) and font metrics (in TFM format). The METAFONT language is described in *The METAFONTbook*.

Like TEX, METAFONT is normally used with a large body of precompiled macros, and font generation in particular requires the support of several macro files. METAFONT looks at its command line to see what name it was called under. Both **inimf** and **virmf** are linked to the **mf** executable. When called as **inimf** (or when the `-initialize` option is given) it can be used to precompile macros into a `.base` file. When called as **virmf** it will use the plain base. When called under any other name, METAFONT will use that name as the name of the base to use. For example, when called as **mf** the mf base is used, which is identical to the plain base. Other bases than plain are rarely used.

The commands given on the command line to the METAFONT program are passed to it as the first input line. (But it is often easier to type extended arguments as the first input line, since shells tend to gobble up or misinterpret METAFONT's favorite symbols, like semicolons, unless you quote them.) As described in *The METAFONTbook*, that first line should begin with a filename, a \controlsequence, or a `&`*basename*.

The normal usage is to say

```
mf \mode=printengine; input font
```

to start processing *font*`.mf`. (Or you can just say **mf** and give the other stuff on the next line.) Other control sequences, such as `batchmode` (for silent operation) can also appear. The name *font* will be the "job name", and is used in forming output file names. If METAFONT doesn't get a file name in the first line, the job name is `mfput`. The default extension, `.mf`, can be overridden by specifying an extension explicitly.

A log of error messages goes into the file *font*`.log`. The output files are *font*`.tfm` and *font*.*number*`gf`, where *number* depends on the resolution and magnification of the font. The mode in this example is shown generically as *printengine*, a symbolic term for which the name of an actual device or, most commonly, the name `localfont` must be substituted. If the mode is not specified or is not valid, METAFONT will default to proof mode which produces large character images for use in font design and refinement. Proof mode can be recognized by the suffix `.2602gf` after the job name. Examples of proof mode output can be found in *Computer Modern Typefaces* (Volume E of Computers and Typesetting). The system of magsteps is identical to the system used by TEX, with values generally in the range 0.5, 1.0, 2.0, 3.0, 4.0 and 5.0.

Magnification can also be specified not as a magstep but as an arbitrary value, such as 1.315, to create special character sizes.

Before font production can begin, it is necessary to set up the appropriate base files. The minimum set of components for font production for a given printengine is the `plain.mf` macro file and the local mode_def file. The macros in `plain.mf` can be studied in an appendix to *The METAFONTbook*; they were developed by Donald E. Knuth, and this file should never be altered. Each mode_def specification helps adapt fonts to a particular printengine. The local ones in use on this computer should be in `modes.mf`.

The `e` response to METAFONT's error prompt causes the default editor to start up at the current line of the current file. The configuration value *Editor* can be used to change the editor used. It may contain a string with `%f` indicating where the filename goes and `%l` indicating where the decimal line number (if any) goes. See Section B.2.15 for more information.

A convenient file is `null.mf`, containing nothing. When METAFONT can't find the file it thinks you want to input, it keeps asking you for another file name; responding `null` gets you out of the loop if you don't want to input anything.

A.8.3 Online Graphics Output

You can see METAFONTs output without printing. Chapter 23 of *The METAFONTbook* describes what you can do. You enable screen ouput by giving `-screen` on the command-line.

A.8.4 Options

`-alias=`*app*
Pretend to be *app*. This affects both the format used and the search paths.

`-aux-directory=`*dir*
Keep auxiliary files in *dir*. This implies `-include-directory=`*dir*.

`-bistack-size=`*n*
Set the internal compiler variable `bistack_size` to *n*. `bistack_size` is the size of the stack for bisection algorithms.

`-buf-size=`*n*
Set the internal compiler variable `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.

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

`-disable-installer`
Disable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-enable-installer`
Enable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-error-line=`*n*
Set the internal compiler variable `error_line` to *n*.

`error_line` is the width of context lines on terminal error messages.

`-half-error-line=`*n*
Set the internal compiler variable `half_error_line` to *n*.

`half_error_line` is the width of first lines of contexts in terminal error messages.

`-halt-on-error`
Quit after the first error.

`-help`
Give help and exit.

`-hhelp`
Show the manual page in an HTML Help window and exit when the window is closed.

`-include-directory=`*dir*
Prepend *dir* to the search path.

`-initialize`
Become the *INI* variant of the compiler.

`-interaction=`*mode*
Set the interaction mode. Must be one of `batchmode`, `nonstopmode`, `scrollmode` and `errorstopmode`. The meaning of these modes is the same as the corresponding commands.

`-job-name=`*name*
Set the name of the job (\jobname. This has an affect on the output file names.

`-job-time=`*file*
Set the time-stamp of all output files equal to *file*'s time-stamp.

`-lig-table-size=`*n*
Set the internal compile variable `lig_table_size` to *n*.

`lig_table_size` is the maximum number of ligature/kern steps. Must be at least 255 and at most 32510.

`-max-print-line=`*n*
: Set the internal compiler variable `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 compiler variable `max_strings` to *n*.

  `max_strings` is the maximum number of strings.

`-max-wiggle=`*n*
: Set the internal compiler variable `max-wiggle` to *n*. `max_wiggle` is number of autorounded points per cycle.

`-mem-max=`*n*
: Set the internal compiler variable `mem_max` to *n*. `mem_max` is the greatest index in the internal memory array.

`-mem-min=`*n*
: Set the internal compiler variable `mem_min` to *n*. `mem_min` is the smallest index in the internal memory array; must be `0` or more; must be equal to `mem_bot` in the *INI* variant of the compiler, otherwise less than or equal to `mem_bot`}.

`-mem-top=`*n*
: Set the internal compiler variable `mem_top` to *n*.

  `mem_top` is the largest index in the internal memory array dumped by the *INI* variant of the compiler; must be substantially larger than `0` and not greater than `mem_max`.

`-move-size=`*n*
: Set the internal compiler variable `move_size` to *n*. `move_size` is the space for storing moves in a single octant.

`-output-directory=`*dir*
: Create output files in *dir*. This implies `-include-directory=`*dir*.

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

`-path-size=`*n*
: Set the internal compiler variable `path_size` to *n*. `path_size` is the maximum number of knots between breakpoints of a path.

`-pool-size=`*n*
: Set the internal compiler variable `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`.

`-quiet`
: Suppress all output, except errors.

`-record-package-usages=`*file*
: Record all package usages and write them into *file*.

`-recorder`
: Enable the file name recorder. This leaves a trace of the files opened for input and output in a file with the extension `.fls`.

`-screen`
: Enable screen output.

`-stack-size=`*n*
: Set the internal compiler variable `stack_size` to *n*.

  `stack_size` is the maximum number of simultaneous input sources.

`-string-vacancies=`*n*
: Set the internal compiler variable `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 compiler's own error messages are stored.

`-tcx=`*name*
Process the TCX table *name*. See Section 4.2.11, for a discussion of TCX tables.

`-terminal=oem`
Use the active code page (e.g., 437) for console output.

`-time-statistics`
Show processing time statistics.

`-trace=`*traceflags*
Write trace messages into the DebugView window. The *traceflags* argument is a comma-separated list of trace categories:

`access`
Accesses to disk files.

`config`
Retrieval of configuration settings.

`error`
Error conditions.

`filesearch`
File search.

`fndb`
File name database.

`fontinfo`
Font information.

`open`
File openings

`process`
Process invocations.

`tempfile`
Temporary files.

`-undump=`*name*
Use *name* as the name of the format to be used, instead of the name by which the program was called or a

`%&`

line.

`-version`
Show version information and exit.

A.8.5 Documentation

The METAFONTbook
ISBN 0-201-13444-6

A.9 mpm

A.9.1 Synopsis

`mpm [-find-updates] [-help] [-hhelp] [-install=`*package*`] [-install-some=`*file*`] [-list]`
`[-print-package-info=`*package*`] [-set-repository=`*url*`] [-uninstall=`*package*`]`

```
[-update=package] [-update-all] [-update-db] [-update-some=file] [-verbose]
[-version]
```

A.9.2 Description

mpm (MiKTEX Package Manager) is used to install packages from a package repository.

The package manager can be run in two modes:

batch
: **mpm** is driven by command-line options.

windowed
: **mpm** shows a package list view with standard GUI controls (such as tool bar buttons and command menus).

mpm starts in windowed mode, if you do not specify any command-line options (see Section 3.2.2).

A.9.3 Options

`-find-updates`
: Print a list of available updates.

`-help`
: Give help and exit.

`-hhelp`
: Show the manual page in an HTML Help window and exit when the window is closed.

`-install=`*package*
: Install the specified package.

`-install-some=`*file*
: Install packages listed (line-by-line) in the specified file.

`-list`
: Output known packages.

`-print-package-info=`*package*
: Output detailed information about the specified package.

`-set-repository=`*url*
: Set the location of the package repository.

`-uninstall=`*package*
: Uninstall the specified package.

`-update=`*package*
: Update the specified package.

`-update-all`
: Find available updates and install them.

`-update-db`
: Update the package database.

`-update-some=`*file*
: Update packages listed (line-by-line) in the specified file.

`-verbose`
: Turn on verbose output mode.

`-version`
: Show version information.

A.10 mpost

A.10.1 Synopsis

```
mpost [-alias=app] [-aux-directory=dir] [-bistack-size=n] [-buf-size=n]
     [-c-style-errors] [-disable-installer] [-enable-installer] [-error-line=n]
     [-font-mem-size=n] [-half-error-line=n] [-halt-on-error] [-help] [-hhelp]
     [-include-directory=dir] [-initialize] [-interaction=mode] [-job-name=name]
     [-job-time=filename] [-lig-table-size=n] [-max-print-line=n] [-max-strings=n]
     [-mem-max=n] [-mem-min=n] [-mem-top=n] [-output-directory=dir] [-param-size=n]
     [-path-size=n] [-pool-size=n] [-quiet] [-record-package-usages=file] [-recorder]
     [-stack-size=n] [-string-vacancies=n] [-tcx=tcxname] [-terminal=oem]
     [-tex=texprogram] [-time-statistics] [-trace=options] [-undump=name] [-version]
     [command | file]
```

A.10.2 Description

METAPOST (installed as **mpost**) reads a series of pictures specified in the METAPOST programming language, and outputs corresponding PostScript code.

A.10.3 Options

`-alias=`*app*
: Pretend to be *app*. This affects both the format used and the search paths.

`-aux-directory=`*dir*
: Keep auxiliary files in *dir*. This implies `-include-directory=`*dir*.

`-bistack-size=`*n*
: Set the internal compiler variable `bistack_size` to *n*. `bistack_size` is the size of the stack for bisection algorithms.

`-buf-size=`*n*
: Set the internal compiler variable `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.

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

`-disable-installer`
: Disable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-enable-installer`
: Enable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-error-line=`*n*
: Set the internal compiler variable `error_line` to *n*.

  `error_line` is the width of context lines on terminal error messages.

`-font-mem-size=`*n*
: Set the internal compiler variable `font_mem_size` to *n*.

  `font_mem_size` is the size, in TEX memory words, of the font memory.

`-half-error-line=`*n*
: Set the internal compiler variable `half_error_line` to *n*.

  `half_error_line` is the width of first lines of contexts in terminal error messages.

`-halt-on-error`
Quit after the first error.

`-help`
Give help and exit.

`-hhelp`
Show the manual page in an HTML Help window and exit when the window is closed.

`-include-directory=`*`dir`*
Prepend *`dir`* to the search path.

`-initialize`
Become the *INI* variant of the compiler.

`-interaction=`*`mode`*
Set the interaction mode. Must be one of `batchmode`, `nonstopmode`, `scrollmode` and `errorstopmode`. The meaning of these modes is the same as the corresponding commands.

`-job-name=`*`name`*
Set the name of the job (\jobname. This has an affect on the output file names.

`-job-time=`*`file`*
Set the time-stamp of all output files equal to *`file`*'s time-stamp.

`-lig-table-size=`*`n`*
Set the internal compile variable `lig_table_size` to *`n`*.

`lig_table_size` is the maximum number of ligature/kern steps. Must be at least 255 and at most 32510.

`-max-print-line=`*`n`*
Set the internal compiler variable `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 compiler variable `max_strings` to *`n`*.

`max_strings` is the maximum number of strings.

`-mem-max=`*`n`*
Set the internal compiler variable `mem_max` to *`n`*. `mem_max` is the greatest index in the internal memory array.

`-mem-min=`*`n`*
Set the internal compiler variable `mem_min` to *`n`*. `mem_min` is the smallest index in the internal memory array; must be `0` or more; must be equal to `mem_bot` in the *INI* variant of the compiler, otherwise less than or equal to `mem_bot`}.

`-mem-top=`*`n`*
Set the internal compiler variable `mem_top` to *`n`*.

`mem_top` is the largest index in the internal memory array dumped by the *INI* variant of the compiler; must be substantially larger than `0` and not greater than `mem_max`.

`-output-directory=`*`dir`*
Create output files in *`dir`*. This implies `-include-directory=`*`dir`*.

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

`-path-size=`*`n`*
Set the internal compiler variable `path_size` to *`n`*. `path_size` is the maximum number of knots between breakpoints of a path.

`-pool-size=`*`n`*
Set the internal compiler variable `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`.

`-quiet`
Suppress all output, except errors.

`-record-package-usages=`*`file`*
Record all package usages and write them into *`file`*.

`-recorder`
Enable the file name recorder. This leaves a trace of the files opened for input and output in a file with the extension `.fls`.

`-stack-size=`*`n`*
Set the internal compiler variable `stack_size` to *`n`*.

`stack_size` is the maximum number of simultaneous input sources.

`-string-vacancies=`*`n`*
Set the internal compiler variable `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 compiler's own error messages are stored.

`-tcx=`*`name`*
Process the TCX table *`name`*. See Section 4.2.11, for a discussion of TCX tables.

`-terminal=oem`
Use the active code page (e.g., `437`) for console output.

`-tex=`*`texprogram`*
Use *`texprogram`* instead of **tex** when compiling text labels.

This flag overrides the environment variable `TEX`.

`-time-statistics`
Show processing time statistics.

`-trace=`*`traceflags`*
Write trace messages into the DebugView window. The *`traceflags`* argument is a comma-separated list of trace categories:

`access`
Accesses to disk files.

`config`
Retrieval of configuration settings.

`error`
Error conditions.

`filesearch`
File search.

`fndb`
File name database.

`fontinfo`
Font information.

`open`
File openings

`process`
Process invocations.

`tempfile`
Temporary files.

`-undump=`*name*
: Use *name* as the name of the format to be used, instead of the name by which the program was called or a

  `%&`

  line.

`-version`
: Show version information and exit.

A.10.4 Aliases

inimp
: Equivalent to `mpost -initialize`.

mpost, virmp
: Equivalent to **mpost**.

A.10.5 Documentation

AT&T technical report CSTR-162
: Run `texdoc mpman`

A.11 mtprint

A.11.1 Synopsis

`mtprint [-even-only] [-help] [-help] [-landscape] [-odd-only] [-page-range=`*range*`]`
`[-print-method=`*method*`] [-print-nothing] [-printer=`*printer*`] [-usage]` *file*`...`

A.11.2 Description

mtprint sends TEX output files to a printing device.

A.11.3 Options

`-even-only`
: Prints only even TEX pages.

`-landscape`
: Selects landscape output format.

`-odd-only`
: Prints only odd TEX pages.

`-page-range=`*range*
: Selects a TEX page range (e.g., 20–21). Multiple `-page-range` options accumulate

–print-method=*method*
: Selects a print method. One of

  `psbmp`
  : This method uses Dvips and Ghostscript to produce the print output.

`ps` This method uses Dvips to produce an intermediate PostScript file which will be sent to the printer. This only works for PostScript printers.

`-print-nothing`
Simulates printing.

–printer=*printer*
Selects a printing device. The default printer is used, if this option is omitted.

A.12 omega

A.12.1 Synposis

```
omega [-alias=app] [-aux-directory=dir] [-buf-size=n] [-c-style-errors]
     [-disable-installer] [-enable-installer] [-enable-write18] [-error-line=n]
     [-half-error-line=n] [-halt-on-error] [-help] [-hhelp] [-include-directory=dir]
     [-initialize] [-interaction=mode] [-job-name=name] [-job-time=file]
     [-max-in-open=n] [-max-print-line=n] [-max-strings=n] [-mem-bot=n] [-mem-max=n]
     [-mem-min=n] [-mem-top=n] [-nest-size=n] [-output-directory=dir] [-param-size=n]
     [-pool-size=n] [-quiet] [-record-package-usages=file] [-recorder] [-save-size=n]
     [-src-specials] [-stack-size=n] [-string-vacancies=n] [-time-statistics]
     [-trace=traceflags] [-trie-op-size=n] [-trie-size=n] [-undump=fmtname]
     [-version] [command | file]
```

A.12.2 Description

Ω is a 16-bit enhanced version of TEX.

A.12.3 Options

`-alias=`*app*
Pretend to be *app*. This affects both the format used and the search paths.

`-aux-directory=`*dir*
Keep auxiliary files in *dir*. This implies `-include-directory=`*dir*.

`-buf-size=`*n*
Set the internal compiler variable `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.

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

`-disable-installer`
Disable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-enable-installer`
Enable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

`-enable-write18`
Enable the \write18 construct (see Section 4.2.10).

`-error-line=`*n*
Set the internal compiler variable `error_line` to *n*.

`error_line` is the width of context lines on terminal error messages.

`-half-error-line=`*n*
Set the internal compiler variable `half_error_line` to *n*.

`half_error_line` is the width of first lines of contexts in terminal error messages.

`-halt-on-error`
Quit after the first error.

`-help`
Give help and exit.

`-hhelp`
Show the manual page in an HTML Help window and exit when the window is closed.

`-include-directory=`*dir*
Prepend *dir* to the search path.

`-initialize`
Become the *INI* variant of the compiler.

`-interaction=`*mode*
Set the interaction mode. Must be one of `batchmode`, `nonstopmode`, `scrollmode` and `errorstopmode`. The meaning of these modes is the same as the corresponding commands.

`-job-name=`*name*
Set the name of the job (\jobname. This has an affect on the output file names.

`-job-time=`*file*
Set the time-stamp of all output files equal to *file*'s time-stamp.

`-max-in-open=`*n*
Set the internal compiler variable `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 compiler variable `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 compiler variable `max_strings` to *n*.

`max_strings` is the maximum number of strings.

`-mem-bot=`*n*
Set the internal compiler variable `mem_bot` to *n*.

`mem_bot` is the smallest index in the internal memory array dumped by the *INI* variant of the compiler; must not be less than `mem_min`.

`-mem-max=`*n*
Set the internal compiler variable `mem_max` to *n*. `mem_max` is the greatest index in the internal memory array.

`-mem-min=`*n*
Set the internal compiler variable `mem_min` to *n*. `mem_min` is the smallest index in the internal memory array; must be `0` or more; must be equal to `mem_bot` in the *INI* variant of the compiler, otherwise less than or equal to `mem_bot`}.

`-mem-top=`*n*
Set the internal compiler variable `mem_top` to *n*.

`mem_top` is the largest index in the internal memory array dumped by the *INI* variant of the compiler; must be substantially larger than `0` and not greater than `mem_max`.

`-nest-size=`*n*
: Set the internal compiler variable `nest_size` to *n*.

  `nest_size` is the maximum number of semantic levels simultaneously active.

`-output-directory=`*dir*
: Create output files in *dir*. This implies `-include-directory=`*dir*.

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

`-pool-size=`*n*
: Set the internal compiler variable `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`.

`-quiet`
: Suppress all output, except errors.

`-record-package-usages=`*file*
: Record all package usages and write them into *file*.

`-recorder`
: Enable the file name recorder. This leaves a trace of the files opened for input and output in a file with the extension `.fls`.

`-save-size=`*n*
: Set the internal compiler variable `save_size` to *n*. `save_size` is the amount of space for saving values outside of current group.

`-src-specials`
: Embed source file information (source specials) in the DVI file.

`-stack-size=`*n*
: Set the internal compiler variable `stack_size` to *n*.

  `stack_size` is the maximum number of simultaneous input sources.

`-string-vacancies=`*n*
: Set the internal compiler variable `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 compiler's own error messages are stored.

`-time-statistics`
: Show processing time statistics.

`-trace=`*traceflags*
: Write trace messages into the DebugView window. The *traceflags* argument is a comma-separated list of trace categories:

  `access`
  : Accesses to disk files.

  `config`
  : Retrieval of configuration settings.

  `error`
  : Error conditions.

  `filesearch`
  : File search.

  `fndb`
  : File name database.

  `fontinfo`
  : Font information.

`open`
File openings

`process`
Process invocations.

`tempfile`
Temporary files.

`-trie-op-size=`*n*
Set the internal compiler variable `trie_op_size` to *n*.

`trie_op_size` is the amount of space for “opcodes” in the hyphenation patterns.

`-trie-size=`*n*
Set the internal compiler variable `trie_size` to *n*.

`trie_size` is the amount of space for hyphenation patterns; should be larger for the *INI* variant of the compiler.

`-undump=`*name*
Use *name* as the name of the format to be used, instead of the name by which the program was called or a

%&

line.

`-version`
Show version information and exit.

A.12.4 Aliases

iniomega
Equivalent to `omega --ini`.

viromega
Equivalent to `omega`.

A.12.5 Documentation

Draft documentation for the Ω system
Run `texdoc omega-manual`

A.13 pdftex

pdfTEX is a special version of TEX that outputs PDF instead of DVI.

A.13.1 Synopsis

```
pdftex [-alias=app] [-aux-directory=dir] [-buf-size=n] [-c-style-errors]
     [-disable-installer] [-enable-installer] [-enable-write18] [-error-line=n]
     [-font-max=n] [-font-mem-size=n] [-half-error-line=n] [-halt-on-error] [-help]
     [-hhelp] [-include-directory=folder] [-initialize] [-interaction==mode]
     [-job-name=name] [-job-time=file] [-max-in-open=n] [-max-print-line=n]
     [-max-strings=n] [-mem-bot=n] [-mem-max=n] [-mem-min=n] [-mem-top=n]
     [-nest-size=n] [-output-directory=folder] [-param-size=n] [-pool-size=n]
     [-quiet] [-record-package-usages=file] [-recorder] [-save-size=n] [-src-specials]
     [-stack-size=n] [-string-vacancies=n] [-tcx=tcxname] [-terminal=oem]
```

[-time-statistics] [-trace=*traceflags*] [-trie-op-size=*n*] [-trie-size=*n*]
[-undump=*fmtname*] [-version] [*command* | *file*]

A.13.2 Options

-alias=*app*
Pretend to be *app*. This affects both the format used and the search paths.

-aux-directory=*dir*
Keep auxiliary files in *dir*. This implies -include-directory=*dir*.

-buf-size=*n*
Set the internal compiler variable 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.

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

-disable-installer
Disable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

-enable-installer
Enable automatic installation of missing packages. Specifying this option overwrites the global configuration setting in MiKTEX Options (see Section 3.2.3).

-enable-write18
Enable the \write18 construct (see Section 4.2.10).

-error-line=*n*
Set the internal compiler variable error_line to *n*.

error_line is the width of context lines on terminal error messages.

-font-max=*n*
Set the internal compiler variable font_max to *n*.

font_max is the maximum internal font number; must not exceed 5000.

-font-mem-size=*n*
Set the internal compiler variable font_mem_size to *n*.

font_mem_size is the size, in TEX memory words, of the font memory.

-half-error-line=*n*
Set the internal compiler variable half_error_line to *n*.

half_error_line is the width of first lines of contexts in terminal error messages.

-halt-on-error
Quit after the first error.

-help
Give help and exit.

-hhelp
Show the manual page in an HTML Help window and exit when the window is closed.

-include-directory=*dir*
Prepend *dir* to the search path.

-initialize
Become the *INI* variant of the compiler.

-interaction=*mode*
Set the interaction mode. Must be one of batchmode, nonstopmode, scrollmode and errorstopmode. The meaning of these modes is the same as the corresponding commands.

`-job-name=`*name*
Set the name of the job (\jobname. This has an affect on the output file names.

`-job-time=`*file*
Set the time-stamp of all output files equal to *file*'s time-stamp.

`-max-in-open=`*n*
Set the internal compiler variable `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 compiler variable `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 compiler variable `max_strings` to *n*.

`max_strings` is the maximum number of strings.

`-mem-bot=`*n*
Set the internal compiler variable `mem_bot` to *n*.

`mem_bot` is the smallest index in the internal memory array dumped by the *INI* variant of the compiler; must not be less than `mem_min`.

`-mem-max=`*n*
Set the internal compiler variable `mem_max` to *n*. `mem_max` is the greatest index in the internal memory array.

`-mem-min=`*n*
Set the internal compiler variable `mem_min` to *n*. `mem_min` is the smallest index in the internal memory array; must be `0` or more; must be equal to `mem_bot` in the *INI* variant of the compiler, otherwise less than or equal to `mem_bot`}.

`-mem-top=`*n*
Set the internal compiler variable `mem_top` to *n*.

`mem_top` is the largest index in the internal memory array dumped by the *INI* variant of the compiler; must be substantially larger than `0` and not greater than `mem_max`.

`-nest-size=`*n*
Set the internal compiler variable `nest_size` to *n*.

`nest_size` is the maximum number of semantic levels simultaneously active.

`-output-directory=`*dir*
Create output files in *dir*. This implies `-include-directory=`*dir*.

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

`-pool-size=`*n*
Set the internal compiler variable `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`.

`-quiet`
Suppress all output, except errors.

`-record-package-usages=`*file*
Record all package usages and write them into *file*.

`-recorder`
Enable the file name recorder. This leaves a trace of the files opened for input and output in a file with the extension `.fls`.

`-save-size=`*n*
: Set the internal compiler variable `save_size` to *n*. `save_size` is the amount of space for saving values outside of current group.

`-src-specials`
: Embed source file information (source specials) in the DVI file.

`-stack-size=`*n*
: Set the internal compiler variable `stack_size` to *n*.

  `stack_size` is the maximum number of simultaneous input sources.

`-string-vacancies=`*n*
: Set the internal compiler variable `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 compiler's own error messages are stored.

`-tcx=`*name*
: Process the TCX table *name*. See Section 4.2.11, for a discussion of TCX tables.

`-terminal=oem`
: Use the active code page (e.g., `437`) for console output.

`-time-statistics`
: Show processing time statistics.

`-trace=`*traceflags*
: Write trace messages into the DebugView window. The *traceflags* argument is a comma-separated list of trace categories:

  `access`
  : Accesses to disk files.

  `config`
  : Retrieval of configuration settings.

  `error`
  : Error conditions.

  `filesearch`
  : File search.

  `fndb`
  : File name database.

  `fontinfo`
  : Font information.

  `open`
  : File openings

  `process`
  : Process invocations.

  `tempfile`
  : Temporary files.

`-trie-op-size=`*n*
: Set the internal compiler variable `trie_op_size` to *n*.

  `trie_op_size` is the amount of space for "opcodes" in the hyphenation patterns.

`-trie-size=`*n*
: Set the internal compiler variable `trie_size` to *n*.

  `trie_size` is the amount of space for hyphenation patterns; should be larger for the *INI* variant of the compiler.

`-undump=`*name*
: Use *name* as the name of the format to be used, instead of the name by which the program was called or a

  %&

  line.

`-version`
: Show version information and exit.

A.13.3 Aliases

pdfinitex
: Equivalent to `pdftex -ini`.

pdfvirtex
: Equivalent to `pdftex`.

A.13.4 Documentation

***The pdfTEX user manual* (A4 version)**
: Run `texdoc pdftex-a`

A.14 tex

A.14.1 Synopsis

```
tex [-alias=app] [-aux-directory=dir] [-buf-size=n] [-c-style-errors]
     [-disable-installer] [-enable-installer] [-enable-write18] [-error-line=n]
     [-font-max=n] [-font-mem-size=n] [-half-error-line=n] [-halt-on-error] [-help]
     [-hhelp] [-include-directory=dir] [-initialize] [-interaction==mode]
     [-job-name=name] [-job-time=file] [-max-in-open=n] [-max-print-line=n]
     [-max-strings=n] [-mem-bot=n] [-mem-max=n] [-mem-min=n] [-mem-top=n]
     [-nest-size=n] [-output-directory=dir] [-param-size=n] [-pool-size=n] [-quiet]
     [-record-package-usages=file] [-recorder] [-save-size=n] [-src-specials]
     [-stack-size=n] [-string-vacancies=n] [-tcx=tcxname] [-terminal=oem]
     [-time-statistics] [-trace=traceflags] [-trie-op-size=n] [-trie-size=n]
     [-undump=fmtname] [-version] [file] [command | file]
```

A.14.2 Description

TEX formats the interspersed text and commands contained in the named files and outputs a typesetter independent file (called DVI, which is short for DeVice Independent). TEX's capabilities and language are described in *The TEXbook*. TEX is normally used with a large body of precompiled macros, and there are several specific formatting systems, such as LATEX, which require the support of several macro files.

TEX looks at its command-line to see what name it was called under. Both **initex** and **virtex** are linked to the **tex** executable. When called as **initex** (or when the `-initialize` option is given) it can be used to precompile macros into a `.fmt` file. When called as **virtex** it will use the plain format. When called under any other name, TEX will use that name as the name of the format to use. For example, when called as **tex** the tex format is used, which is identical to the plain format. The commands defined by the plain format are documented in *The TEXbook*. Other formats that are often available include latex and amstex.

The commands given on the command-line to the TEX program are passed to it as the first input line. (But it is often easier to type extended arguments as the first input line, since shells tend to gobble up

or misinterpret TEX's favorite symbols, like backslashes, unless you quote them.) As described in *The TEXbook*, that first line should begin with a file name, a \controlsequence, or a &*formatname*.

The normal usage is to say

```
tex paper
```

to start processing `paper.tex`. The name "paper" will be the "job name", and is used in forming output file names. If TEX doesn't get a file name in the first line, the job name is `texput`. When looking for a file, TEX looks for the name with and without the default extension (`.tex`) appended, unless the name already contains that extension. If paper is the "job name", a log of error messages, with rather more detail than normally appears on the screen, will appear in `paper.log`, and the output file will be in `paper.dvi`.

TEX will look in the first line of the file `paper.tex` to see if it begins with the magic sequence `%&`. If the first line begins with `%&format --translate-file tcxname`, then TEX will use the named format and transation table *tcxname* to process the source file. Either the format name or the `-translate-file` specification may be omitted, but not both.

The `e` response to TEX's error prompt causes the default editor to start up at the current line of the current file. The configuration value *Editor* can be used to change the editor used. It may contain a string with `%f` indicating where the file name goes and `%l` indicating where the decimal line number (if any) goes. See Section B.2.15 for more information.

A convenient file is `null.tex`, containing nothing. When TEX can't find a file it thinks you want to input, it keeps asking you for another file name; responding `null` gets you out of the loop if you don't want to input anything. You can also type your EOF character (usually **Control**–**Z**).

A.14.3 Options

`-alias=`*app*
: Pretend to be *app*. This affects both the format used and the search paths.

`-aux-directory=`*dir*
: Keep auxiliary files in *dir*. This implies `-include-directory=`*dir*.

`-buf-size=`*n*
: Set the internal compiler variable `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.

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

`-enable-write18`
: Enable the \write18 construct (see Section 4.2.10).

`-error-line=`*n*
: Set the internal compiler variable `error_line` to *n*.

  `error_line` is the width of context lines on terminal error messages.

`-font-max=`*n*
: Set the internal compiler variable `font_max` to *n*.

  `font_max` is the maximum internal font number; must not exceed `5000`.

`-half-error-line=`*n*
: Set the internal compiler variable `half_error_line` to *n*.

  `half_error_line` is the width of first lines of contexts in terminal error messages.

`-halt-on-error`
: Quit after the first error.

`-help`
: Give help and exit.

`-initialize`
Become the *INI* variant of the compiler.

`-include-directory=`*dir*
Prepend *dir* to the search path.

`-interaction=`*mode*
Set the interaction mode. Must be one of `batchmode`, `nonstopmode`, `scrollmode` and `errorstopmode`. The meaning of these modes is the same as the corresponding commands.

`-job-name=`*name*
Set the name of the job (\jobname. This has an affect on the output file names.

`-job-time=`*file*
Set the time-stamp of all output files equal to *file*'s time-stamp.

`-max-in-open=`*n*
Set the internal compiler variable `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 compiler variable `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 compiler variable `max_strings` to *n*.

`max_strings` is the maximum number of strings.

`-mem-bot=`*n*
Set the internal compiler variable `mem_bot` to *n*.

`mem_bot` is the smallest index in the internal memory array dumped by the *INI* variant of the compiler; must not be less than `mem_min`.

`-mem-max=`*n*
Set the internal compiler variable `mem_max` to *n*. `mem_max` is the greatest index in the internal memory array.

`-mem-min=`*n*
Set the internal compiler variable `mem_min` to *n*. `mem_min` is the smallest index in the internal memory array; must be `0` or more; must be equal to `mem_bot` in the *INI* variant of the compiler, otherwise less than or equal to `mem_bot`}.

`-mem-top=`*n*
Set the internal compiler variable `mem_top` to *n*.

`mem_top` is the largest index in the internal memory array dumped by the *INI* variant of the compiler; must be substantially larger than `0` and not greater than `mem_max`.

`-nest-size=`*n*
Set the internal compiler variable `nest_size` to *n*.

`nest_size` is the maximum number of semantic levels simultaneously active.

`-output-directory=`*dir*
Create output files in *dir*. This implies `-include-directory=`*dir*.

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

`-pool-size=`*n*
Set the internal compiler variable `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`.

`-quiet`
Suppress all output, except errors.

`-save-size=`*n*
Set the internal compiler variable `save_size` to *n*. `save_size` is the amount of space for saving values outside of current group.

`-src-specials`
Embed source file information (source specials) in the DVI file.

`-stack-size=`*n*
Set the internal compiler variable `stack_size` to *n*.

`stack_size` is the maximum number of simultaneous input sources.

`-string-vacancies=`*n*
Set the internal compiler variable `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 compiler's own error messages are stored.

`-tcx=`*name*
Process the TCX table *name*. See Section 4.2.11, for a discussion of TCX tables.

`-terminal=oem`
Use the active code page (e.g., 437) for console output.

`-time-statistics`
Show processing time statistics.

`-trace=`*traceflags*
Write trace messages into the DebugView window. The *traceflags* argument is a comma-separated list of trace categories:

`access`
Accesses to disk files.

`config`
Retrieval of configuration settings.

`error`
Error conditions.

`filesearch`
File search.

`fndb`
File name database.

`fontinfo`
Font information.

`open`
File openings

`process`
Process invocations.

`tempfile`
Temporary files.

`-trie-size=`*n*
Set the internal compiler variable `trie_size` to *n*.

`trie_size` is the amount of space for hyphenation patterns; should be larger for the *INI* variant of the compiler.

`-trie-op-size=`*n*
Set the internal compiler variable `trie_op_size` to *n*.

`trie_op_size` is the amount of space for "opcodes" in the hyphenation patterns.

`-undump=`*name*
: Use *name* as the name of the format to be used, instead of the name by which the program was called or a

  %&

  line.

`-version`
: Show version information and exit.

A.14.4 Aliases

initex
: Equivalent to `tex -ini`.

virtex
: Equivalent to `tex`.

A.14.5 See Also

See Section A.15, for an alternative way to invoke TEX.

A.14.6 Documentation

The TEXbook
: ISBN 0-201-13448-9

A.15 texify

A.15.1 Synopsis

```
texify [-@] [-batch | -b] [-clean | -c] [-expand | -e] [-I dir] [-help | -h]
     [-language=lang | -l lang] [-max-iterations=n] [-mkidx-option=option] [-pdf |
     -p] [-quiet | -q | -silent | -s] [-run-viewer] [-src] [-texinfo=cmd | -t=cmd]
     [-tex-option=option] [-version | -v] [-verbose | -V] [-viewer-option=option]
     file...
```

A.15.2 Description

texify runs Texinfo or LATEX input files through **tex** (**pdftex**) in turn until all cross-references are resolved, building all indices.

The directory containing each *file* is searched for included files. The suffix of *file* is used to determine its language (LATEX or Texinfo).

makeinfo is used to perform Texinfo macro expansion before running **tex** when needed.

A.15.3 Options

`-@` Use @input (instead of \input); for preloaded Texinfo.

`-batch`, `-b`
: No interaction.

`-clean`, `-c`
: Remove all auxiliary files.

`-expand`, `-e`
: Force macro expansion using **makeinfo**.

`-I` *dir*
: Search *dir* for input files.

`-help`, `-h`
: Display help and exit successfully.

`-language=`*lang*, `-l` *lang*
: Specify the language of input files: either `latex` or `texinfo`.

`-max-iterations=`*n*
: Limits the number of iterations to prevent endless processing. The default for *n* is `5`.

`-mkidx-option=`*option*
: Pass *option* to the index generator.

`-pdf`, `-p`
: Use **pdftex** (or **pdflatex**) for processing.

`-quiet`, `-q`, `-silent`, `-s`
: No screen output unless errors plies `-batch`).

`-run-viewer`
: Run a viewer on the resulting DVI (PDF) file.

`-src`
: Pass `-src-specials` to the TEX compiler.

`-texinfo=`*cmd*, `-t=`*cmd*
: Insert *cmd* after `@setfilename` in copy of input file. Multiple values accumulate.

`-tex-option=`*option*
: Pass *option* to the compiler.

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

`-version`, `-v`
: Display version information and exit successfully.

`-viewer-option=`*option*
: Pass *option* to the viewer.

A.15.4 Environment Variables

The values of the `BIBTEX`, `LATEX` (or `PDFLATEX`), `MAKEINDEX`, `MAKEINFO`, `TEX` (or `PDFTEX`), and `TEXINDEX` environment variables are used to run those commands, if they are set.

A.15.5 Aliases

tex2dvi
: Equivalent to **texify**.

Appendix B

`miktex.ini`: The MiKTEX Configuration File

MiKTEX reads configuration settings from the file `miktex.ini`.

CAUTION

It is highly recommended that you edit a local version of `miktex.ini` when changing configuration settings. See Section 3.7, for more information.

B.1 About Search Paths

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

A search path is a semicolon-separated list of *directory specifications*. MiKTEX traverses the list from left to right, when it searches for a file.

A directory specification is a directory path with embedded *control sequences*. The following control sequences can be used:

`%R` A placeholder for the TEXMF root directory.

`//` A flag which causes MiKTEX to search recursively.

B.1.1 Example

Assuming that `C:\localtexmf;C:\texmf` is the list of TEXMF root directories, the search path `.;%R\tex\plain//;%R\tex\generic//;%R\tex//` causes TEX to search its input files in the following locations:

1. In the current directory (`.`).
2. In the directory `C:\localtexmf\tex\plain` and in all folders below it.
3. In the directory `C:\texmf\tex\plain` and in all folders below it.
4. In the directory `C:\localtexmf\tex\generic` and in all folders below it.
5. In the directory `C:\texmf\tex\generic` and in all folders below it.

6. In the directory `C:\localtexmf\tex` and in all folders below it.
7. In the directory `C:\texmf\tex` and in all folders below it.

B.1.2 Testing a Search Path

You can use **findtexmf** to test whether an input file can be found via the configured search path.

For example, run `findtexmf a4.sty` to search for the LaTeX style file `a4.sty`. If the search succeeds, then **findtexmf** reports the absolute path to the file, as in:

```
> findtexmf a4.sty
C:\texmf\tex\latex\ntgclass\a4.sty
>
```

B.2 `miktex.ini` Settings

The MiKTeX configuration file is divided into several named *sections*. Each section contains configuration settings for a specific application or feature.

A section starts with a line containing the name of the section in brackets, as in:

```
[TeX]
```

A section contains assignments to *named values*. Each assignment stands on a separate line, as in:

```
Input Dirs=.;%R\tex\plain//;%R\tex\generic//;%R\tex//
```

B.2.1 [bibtex]

`Input Dirs=`*searchpath*
: Search path for BibTeX input files (both databases and style files).

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

B.2.2 [dvipdfm]

`Input Dirs=`*searchpath*
: Where Dvipdfm searches for the configuration file (`config`).

`MAPPath=`*searchpath*
: Where Dvipdfm searches for font mapping files (`*.map`).

`PSPath=`*searchpath*
: Where Dvipdfm searches for font encoding files (`*.enc`).

B.2.3 [dvips]

`CONFIGPath=`*searchpath*
: Where Dvips searches configuration files (`config.*`).

`ENCPath=`*searchpath*
: Where Dvips searches for font encoding files (`*.enc`).

`GraphicsPath=`*searchpath*
: Where Dvips searches for graphics files (`*.eps`).

MAPPath=searchpath
: Where Dvips searches for font mapping files (.map).

PSPath=*searchpath*
: Where Dvips searches for all sorts of PostScript related files (*.afm;*.pfb;*.pro).

B.2.4 [Graphics]

The [Graphics] section contains graphics conversion rules. A rule has the syntax:

```
.fromext.toext=commandline
```

.fromext is the file name extension of the source file. *.toext* is the file name extension of the destination file. *commandline* is the command (plus arguments) which does the conversion. The command-line may include the following placeholders:

%1 The name of the input file.

%o The name of the output file.

The standard MiKTEX configuration file contains the following standard rules:

```
.gif.bmp=giftopnm "%i" | ppmtobmp -windows > "%o"
.pcx.bmp=pcxtoppm "%i" | ppmtobmp -windows > "%o"
.png.bmp=pngtopnm "%i" | ppmtobmp -windows > "%o"
.tga.bmp=tgatoppm "%i" | ppmtobmp -windows > "%o"
.tif.bmp=tifftopnm "%i" | ppmtobmp -windows > "%o"
.tiff.bmp=tifftopnm "%i" | ppmtobmp -windows > "%o"
```

B.2.5 [MakeIndex]

INDEXSTYLE=*searchpath*
: Search path for MakeIndex style files (*.ist).

B.2.6 [MakePK]

DestDir=*path*
: Specifies the directory which receives newly created PK (Packed Raster Font) files.

The specification may include special control sequences which will be replaced at run-time:

%m The METAFONT mode.

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

%s The font supplier.

%t The typeface name.

B.2.7 [MakeTFM]

DestDir=*path*
: Specifies the directory which receives newly TFM (TEX Font Metrics) files.

The specification may include special control sequences which will be replaced at run-time:

`%s` The font supplier.

`%t` The typeface name.

B.2.8 [METAFONT]

`Input Dirs=`*searchpath*
Search path. for METAFONT input files

`InputEnvVar=`*envvar*
The name of an environment variable which contains additional input directories.

B.2.9 [MetaPost]

`Input Dirs=`*searchpath*
Search path for METAPOST input files.

`InputEnvVar=`*envvar*
The name of an environment variable which contains additional input directories.

B.2.10 [MiKTeX]

The `[MiKTeX]` section contains general configuration settings and search path specifications.

B.2.10.1 Search Paths

`AFMPath=`*searchpath*
Used to locate Adobe font metric files (`*.afm`).

`BASEPath=`*searchpath*
Used by METAFONT to locate base files (`*.base`).

`ENCPath=`*searchpath*
Used to locate font encoding files (`*.enc`).

`EXEPath=`*searchpath*
Used to locate MiKTEX executables (`*.bat;*.com;*.exe)`.

`FMTPath=`*searchpath*
Used by TEX (and derivatives) to locate format files (`*.efmt;*.eofmt;*.fmt`).

`GraphicsPath=`*searchpath*
Used to locate all sorts of graphics files (`*.bmp;*.eps;...`).

`HBFPath=`*searchpath*
Used by HBF2GF to locate `.hbf` files.

`MAPPath=`*searchpath*
Used by the MkFntMap utility to locate font mapping files (`*.map`).

`MEMPath=`*searchpath*
Used by METAPOST to locate `.mem` files.

`OFMPath=`*searchpath*
Used by Ω and ε-Ω to locate font Ω metric files (`*.ofm`).

`OVFPath=`*searchpath*
Used by Ω and ε-Ω to locate Ω virtual fonts (`*.ovf`).

OVPPath=*searchpath*
: Used OVP2OVF to locate locate `.ovp` files.

PKPath=*searchpath*
: Used to locate packed font raster files (`*.pk`).

PK File Name=*filenamespec*
: File name convention for PK (packed raster) files.

PSPath=*searchpath*
: Used to locate all sorts of PostScript related files.

TCXPath=*searchpath*
: Used to locate character translation files (`*.tcx`).

TFMPath=*searchpath*
: Used to locate TEX font metric files (`*.tfm`).

TTFPath=*searchpath*
: Used to locate TrueType font files (`*.ttc;*.ttf`).

Type1Path=*searchpath*
: Used to locate Type 1 font files (`*.pfa;*.pfb`).

VFPath=*searchpath*
: Used to locate virtual font files (`*.vf`).

B.2.10.2 Memory Settings for TEX & Friends

The values described here are used by TEX & Friends when allocating memory for internal data structures.

bistack_size=*n*
: Size of stack for bisection algorithms.

buf_size=*n*
: 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=*n*
: Width of context lines on terminal error messages.

error_line=*n*
: Width of context lines on terminal error messages.

font_max=*n*
: Maximum internal font number; must not exceed 5000.

font_mem_size=*n*
: Number of words of `font_info` for all fonts.

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

lig_table_size=*n*
: Maximum number of ligature/kern steps, must be at least 255 and at most 32510.

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

max_print_line=*n*
: Width of longest text lines output; should be at least 60.

max_strings=*n*
: Maximum number of strings; must not exceed 1073741823.

max_wiggle=*n*
: Number of autorounded points per cycle.

`mem_bot=`*n*
: Smallest index in the mem array dumped by **initex**; must not be less than `mem_min`.

`mem_max=`*n*
: Greatest index in TEX's internal `mem` array; must be strictly less than 1073741823.

`mem_min=`*n*
: 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_top=`*n*
: Largest index in the mem array dumped by **initex**; must be substantially larger than 0 and not greater than `mem_max`.

`move_size=`*n*
: Space for storing moves in a single octant.

`nest_size=`*n*
: Maximum number of semantic levels simultaneously active.

`param_size=`*n*
: Maximum number of simultaneous macro parameters.

`path_size=`*n*
: Maximum number of knots between breakpoints of a path.

`pool_size=`*n*
: 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=`*n*
: Space for saving values outside of current group; must be at most 1073741823.

`stack_size=`*n*
: Maximum number of simultaneous input sources.

`string_vacancies=`*n*
: 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.

`trie_op_size=`*n*
: Space for "opcodes" in the hyphenation patterns.

`trie_size=`*n*
: Space for hyphenation patterns; should be larger for **initex** than it is in production versions of TEX.

B.2.11 [Omega]

`Input Dirs=`*searchpath*
: The search path for Ω input files.

`OCPPath=`*searchpath*
: Where Ω searches for OCP files.

B.2.12 [otp2ocp]

`Input Dirs=`*searchpath*
: Used by OTP2OCP to locate `.otp` files.

B.2.13 [pdfeTeX]

`Input Dirs=`*searchpath*
: Where pdf-ε-TEX searches for input files.

`PSPath=`*searchpath*`searchpath`
: Where pdf-ε-TEX searches for font mapping files (`*.map`) and font encoding files (`.enc`).

B.2.14 [pdfTeX]

`dest_names_size=`*n*
: Maximum number of names in name tree of PDF output file.

`Input Dirs=`*searchpath*
: Where pdfTEX searches for input files.

`obj_tab_size=`*n*
: Minimum size of the cross-reference table for PDF output.

`PSPath=`*searchpath*
: Where pdfTEX searches for font mapping files (`*.map`) and font encoding files (`.enc`).

B.2.15 [TeX]

`Editor=`*command*
: The command to be started when the user presses **e** in the error menu.

  command may contain 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)
  ```

`Input Dirs=`*searchpath*
: Used by TEX to locate input files.

`InputEnvVar=`*envvar*
: The name of the environment variable which contains additional input directories.

`write18=`*val*
: Status of \write18 primitive. *val* must be on of: `disable`, `enable`.

B.2.16 [ttf2pk]

`ENCPath=`*searchpath*
: Used by TTF2PK to locate font encoding files (`*.enc`).

B.2.17 [ttf2tfm]

ENCPath=*searchpath*
: Used by TTF2TFM to locate font encoding files (`*.enc`).

B.2.18 [Yap]

Input Dirs=*searchpath*
: Used by Yap to locate DVI files (`*.dvi`).

Appendix C

`pdftex.cfg`: The pdfTeX Configuration File

pdfTeX configurations settings are read from the file `pdftex.cfg` when the pdfTeX format file is being created.

> CAUTION
>
> 
>
> It is highly recommended that you edit a local version of `pdftex.cfg` when changing configuration settings. See Section 3.10, for more information.

C.1 `pdftex.cfg` Settings

This section is "borrowed" from the pdfTeX manual.

A typical `pdftex.cfg` file looks like this, setting up output for A4 paper size and the standard TeX offset of 1 inch:

```
compress_level      9           % use the best level of compression
decimal_digits      3           % max. 3 digits after the decimal point
horigin             1 true in   % horizontal origin offset
image_resolution    300         % when not specified, embed images at 300 DPI
move_chars          1           % move chars in 0..31 to higher area
output_format       1           % the implicit output will be PDF
page_height         297 true mm % A4 paper height
page_width          210 true mm % A4 paper width
pdf_minorversion    4           % produce PDF 1.4
pk_resolution       600         % use PK fonts at 600 DPI
vorigin             1 true in   % vertical origin offset
```

The configuration file sets default values for these parameters, and they all can be overridden in the TeX source file. Dimensions can be specified as `true`, which makes them immune for magnification (when set).

compress_level

This integer parameter specifies the level of text and in||line graphics compression. pdfTeX uses Zip compression. A value of 0 means no compression, 1 means fastest, 9 means best, 2..8 means something in between. Just set this value to 9, unless there is a good reason to do otherwise; 0 is great for testing macros that use \pdfliteral.

decimal_digits
This integer specifies the preciseness of real numbers in PDF page descriptions. It gives the maximal number of decimal digits after the decimal point of real numbers. Valid values are in range 0..5. A higher value means more precise output, but also results in a much larger file size and more time to display or print. In most cases the optimal value is 2. This parameter does {\em not} influence the precision of numbers used in raw PDF code, like that used in \pdfliteral and annotation action specifications.

horigin & vorigin
These dimension parameters can be used to set the offset of the TEX output box from the top left corner of the “paper”.

image_resolution
When pdfTEX is not able to determine the natural dimensions of an image, it assumes a resolution of type 72 dots per inch. Use this variable to change this default value.

move_chars
Although PDF output is claimed to be portable, especially when all font information is included in the file, problems with printing and viewing have a persistent nature. Moving the characters in range 0–31 sometimes helps a lot. When set to 1, characters are only moved when a font has less than 128 glyphs, when set to 2 higher slots are used too.

output_format
This integer parameter specifies whether the output format should be DVI or PDF. A positive value means PDF output, otherwise we get DVI output.

page_width & page_height
These two dimension parameters specify the output medium dimensions (the paper, screen or whatever the page is put on). If they are not specified, these values are calculated.

pdf_minorversion
Sets the PDF version of the generated file and the latest allowed PDF version of included PDFs. The value 3 tells pdfTEX to set the PDF version to 1.3 and allows only included PDFs with versions less than 1.3. A suitable default value is 4.

pk_resolution
One can use this entry to specify the resolution for bitmap fonts. Nowadays most printers are capable to print at least 600 dots per inch, so this is a reasonable default.

Appendix D

updmap.cfg: Configuration Settings for Outline Fonts

The configuration file `updmap.cfg` contains declarative instructions, which will be used to build font map files.

CAUTION

It is highly recommended that you edit a local version of `updmap.cfg` when changing or adding instructions. See Section 3.11.1, for more information.

D.1 updmap.cfg Instructions

`updmap.cfg` can contain the following instructions:

`dvipsPreferOutline` *value*
: Specifies whether Dvips prefers bitmap fonts or outline fonts if both are available. Valid values are `true` (default) and `false`.

  Independend of this setting, outlines can be forced by putting

  ```
  p psfonts_t1.map
  ```

  into a configuration file that Dvips reads. Bitmaps (for the fonts in question) can be forced by putting

  ```
  p psfonts_pk.map
  ```

  into a configuration file. Such configuration files are provided, which can be enabled via

  ```
  dvips -Poutline ...
  ```

  resp.

  ```
  dvips -Ppk ...
  ```

`LW35` *value*
: Specifies which fonts for the “Basic 35 LaserWriter Fonts” will be used and how their file names are chosen. Valid values:

  `URW` URW fonts with “vendor” file names (e.g., `n0190641.pfb`).

`URWkb`
: URW fonts with “berry” file names (e.g., `uhvbo8ac.pfb`). `URWkb` is the default value.

`ADOBE`
: Adobe fonts with “vendor” file names (e.g. `hvnbo___.pfb`).

`ADOBEkb`
: Adobe fonts with “berry” file names (e.g., `phvbo8an.pfb`).

`dvipsDownloadBase35` *value*
: Specifies whether Dvips downloads the standard 35 LaserWriter fonts with the document. If these fonts are not downloaded, then they must be available in the PostScript printer (interpreter). Valid values are `true` and `false` (default).

  Whatever is specified here, the user can override it by specifying

```
dvips -Pdownload35 ...
```

  resp.

```
dvips -Pbuiltin35 ...
```

  to either download the LW35 fonts resp. use the build-in fonts.

`pdftexDownloadBase14` *value*
: Specifies whether pdfTeX downloads the base 14 PDF fonts. Valid values are `true` (default) and `false`.

  Since some configurations (PostScript / PDF tools / printers) use bad default fonts, it is safer to download the fonts. The PDF files will get bigger, though.

`dvipdfmDownloadBase14` *value*
: Specifies whether Dvipdfm downloads the base 14 PDF fonts. Valid values are `true` (default) and `false`.

  Since some configurations (PostScript / PDF tools / printers) use bad default fonts, it is safer to download the fonts. The PDF files will get bigger, though.

`Map` *filename*
: Arranges that the contents of *filename* will be included in `psfonts.map`.

`MixedMap` *filename*
: Arranges that the contents of *filename* will be included in `psfonts.map`, unless `dvipsPreferOutline` is set to `false`.

  “Mixed” means that the fonts referenced in the file are available as bitmap and as outline.

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