fpTeX 0.4

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1.1 What is fpTeX?

In a word, fpTeX is a *free* port to Windows 9x and Windows NT– refered to as Win32 – of the well known distribution teTeX for Unix.

More precisely, given obvious differences between Unix and Win32, some things behave differently under fpTeX : some are still missing, some are just different, but the large majority behave just the same as under Unix. See section 1.4 for more details about the programs.

1.2 Why use teTeX under **Win32**

The teTeX distribution is based on Web2C.

Web2C by itself is a translator from the Pascal language to the C language. Donald E. KNUTH has originally written TeX in a dialect of Pascal named Web, so the name Web2C. Web2C has been build upon several authors work, but has been much enhanced recently by Karl Berry and now Olaf Weber. See section 11.

Web2C uses the Kpathsea library for files handling. This library is the main part to configure for TeX to run smoothly. It is very powerful and flexible, but quite complex too.

I began to port Web2C after leaving the Linux world for the NT world. Web2C is the most used TeX distribution in the Unix world, and the one on which many developments are based. Web2C takes you to a high level of TeXnicity : latest versions of TeX, METAFONT, MetaPost, use of the high speed search kpathsea library to name only some of its features. Web2C should satisfy the most demanding users. Moreover, its wide use makes it well tested.

Web2C had already been ported to a wide variety of OS apart from Unixes: VMS, MVS, Amiga, OS/2, DOS. Win32 has everything of a high-tech OS[1], so there was no reason for Web2C not to be ported to it. It would make life easier for administrators who have Unix, Windows (and maybe others) TeX distributions to maintain. So, the main goal of the port was compatibility with the reference platforms (Unixes): administration of TeX sites should be similar. For further details on the Win32 adaptation, take look at Section 8.

1.3 Where to get fpTeX and other net resources

You can reach me at my email address: mailto:Fabrice.Popineau@supelec.fr.

The TeX Users Group is kindly hosting a mailing-list dedicated to fpTeX. This is a very low volume one. It is used for announcements, bugs reports or as well to discuss about improvements or various users problems. To subscribe, send a message to mailto:majordomo@tug.org with `subscribe fptex` in the body.

Here are a few fpTeX related pages:
http://www.ese-metz.fr/ popineau/fptex/.

The released files are on CTAN and any CTAN mirror in `systems/web2c/fptex`.

These files are mirrored from fpTeX's home: ftp://ftp.ese-metz.fr/pub/tex/win32
You can also find beta versions of various programs in:
ftp://ftp.ese-metz.fr/pub/tex/win32-beta

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[1] Actually, Windows NT because Windows 9x has everything of a bug museum!

1.4 What's in this port

The distribution is made of the following packages:

Programs using the kpathsea library	
TeX 3.14159	the TeX compiler
METAFONT 2.7182	the font compiler
MetaPost 0.641	graphic language along METAFONT style, produce nice postscript figures,
METAFONTware	support tools for METAFONT
TeXware	support tools for TeX
e-TeX 2.1	the e-TeX extension to TeX
Omega 1.11	a TeX extension towards Unicode (and much more)
pdfTeX 0.14f	a TeXcompiler that can produce PDF
mktex*	support programs for generating missing font files, `fmtutil` for building formats
BibTeX 0.99C	the bibliography compiler
BibTeX8 3.71	the same, but rewritten in C and designed for 8 bits character sets
ChkTeX	a TeX and LaTeX syntax checker
CJK Utilities	set of tools to handle Far-East fonts
dtl	translates DVI files into human readable format and vice-versa
dvi2tty	previews DVI files on a text mode console
dvidvi	helps with pagination problems
dviljk 2.6	prints on *LaserJet* printers
dvipdfm 0.12.7b	converts DVI into PDF format
dvipsk 5.86d	converts DVI into Postscript format
gsftopk 1.19.1	rasterizes Type 1 fonts into PK fonts
HBF to GF	font format converter
Ispell	Spell checker with American, English, German and French dictionaries, to be used in conjunction with Emacs
lacheck	cheks your LaTeX files without actually compiling them
ltx2rtf 4.3	converts LaTeX files to RTF files
makindexk 2.13	processes index files
musixflx	helps writing music
odvipsk	converts Omega extended DVI files to Postscript
owindvi 0.67	previews Omega extended DVI files
ps2pkm 1.5	another rasterizer for Type 1 files
seetexk	various tools to manipulate DVI files
t1utils 1.11	tools to assemble and disassemble Type 1 fonts
ttf2pfb, ttf2pk, ttfdump	a collection of tools to manipulate TTF fonts
tex4htk	converts TeX or LaTeX files to HTML
texinfo	the GNU technical documentation package relying on TeX
windvi 0.67	previews DVI files
Other programs supplied	
psutils	a collection of tools to manipulate Postscript files
gzip, bzip2	compressors with their DLLs
PNG tools	supplementary tools to handle PNG files
TIFF tools	supplementary tools to handle TIFF files
Jpeg to PS	converter from the JPEG format to Postscript
NetPBM	a collection of tools to handle, transform and convert graphic files of various format
TeXSetup	the setup program
EPS to PDF	converter using Ghostscript

To be complete, you will find in annexe 11 the rough listing of the complete binary distribution.

2 TeX and **Win32** concepts

2.1 Different flavors of **Win32**

What we call Win32 is not an operating system by itself. It is a set of functions – and a large one[2] – that you can use to write programs for different operating systems of the Windows family.

Windows comes in different flavors :

- Win95 and Win98, which *are not true multitasking, multithreading* environments. They are the latest – and hopefully last – metamorphosis of DOS. This can be more or less proven by the fact that when booting, the PC will load the `command.com` interpreter, and if you stop the boot process at this point, you can ask for the current (DOS) version and it will ansver something like 'MS-DOS 7.0';

- NT, which is a new operating system written from scratch, capable of true multitasking behaviour, and loaded with high level features;

- Windows 2000, written on an NT basis, with all the bells and whistles of Win98.

Win9x are able to run 32 bits programs and 16 bits programs concurrently. But the operating system by itself is not entirely written in 32bits mode, and does not support memory protection: 16bits applications can overwrite parts of the operating system memory! Some parts of the system like the GDI (Graphical Device Interface) manage limited resources like bitmaps, fonts, pens and so on for the set of all programs that run concurrently. All the bitmaps headers available at the same time can't amount for more than 64kb. This explains the performance tool and the fact that you can put your system on his knees by making intensive use of graphic objects for example.

NT and Win2000 do not suffer from these limitations, and neither from other Win9x limitations. They are true multitasking environments, with protected memory. They are much more responsive than Win9x because of better memory management, better file system and so on.

2.2 Command line prompt

You will wonder : "why would I need to use a command line prompt when I have Windows ?".

Good question. The problem is of very general nature. Not all operations can be done easily using only a GUI. Command line gives you programming power – assuming a clever command interpretor.

But the problem here is more fundamental : TeX is *a batch* tool. Not an interactive one. TeX needs to calculate the best layout for each page, resolve cross-references and so on. This can be done only by a global processing of the document. It is not (yet) a task that can be done interactively.

This means that you should use TeX from a command line. In fact the situation is not so bad. There is an advantage to write command line tools for complex processing: they are better debugged, because not tight to GUI problems, and GUI tools can be designed to interface the command line tools. This is the case for TeX where you will interact with it most of the time through a GUI text editor – see section 3.4.1.

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[2]Around 12000 functions in the header files of the Microsoft SDK

However, you may need to use the command line prompt in a number of situations, by example in case of problems and you want to debug your setup – see section 3.5.

Win9x You will open a command line prompt by looking either for the MS-DOS icon in the "Start->Programs" menu, either by choosing "Start->Run" menu and typing in `command.com`

NT and Win2000 You will open a command line prompt by looking for the "Command Prompt" in the "Start->Accessories" menu[3]. You can also choose the "Start->Run" menu and type in `cmd.exe`, which is the name of the brand new command interpretor for NT[4].

2.3 Path separators

The Win32 API understands both / and \\ characters et PATH separators. But the command interpretors do not! So whenever a path name is used programmatically, you can use both separators, and even mix them up in the same path name. But on the command line, you must type \\ as path separator. The reason is comaptibility: the command processor used the / to introduce arguments to commands.

All this to say: do not be surprised to read path names written using the Unix convention; fpTEX is a port or Web2C, and aims to be compatible across platforms. For this reason, all the configuration files that need to specify path names use the Unix convention.

2.4 File systems

The worse feature of Win9x with regard to TEX is probably the so-called FAT file system. TEX uses many many small files, with size around 1kb – 3kb. The FAT file system is old, and predates by far the multi-gigabytes hard disks we have today. It means it can't manage efficiently the 30000 TEX files found on the CD-ROM. The FAT file system will allocate a minimum of 32kb for *any* file on a huge partition. It means that TEX will use much more disk space than it actually needs.

The other, more modern, file systems available – namely FAT32 and NTFS – do not have this drawback. They manage clusters of 4kb only[5].

2.5 TEX engines

If you have a look at the Web2C documentation, you will read that all the various TEX derived programs use the same base engine. For example, `tex.exe` and `latex.exe` are exact copies of the same program, but each one will use a different format file, based on its calling name.

Under Unix, this feature is implemented through *symbolic links*. It saves up a bit of disk space, because some engines are used with many different format files.

The Win32 API does not know about file links. So to save up almost the same amount of memory, I choose to put all the TEX base engines in DLLs (*Dynamic Linked Library*). This means that you will have the following layout:

```
11/19/98  11:07a                  16,384 latex.exe
11/19/98  11:07a                 217,088 tex.dll
11/19/98  11:07a                  16,384 tex.exe
```

---

[3]These locations may change across different OS versions.
[4]Which explains why it is untrue to call this a *DOS* box under NT!
[5]You can lower the limit to 512 bytes on NTFS

and the `latex.exe` file is nothing but a rough copy of `tex.exe` using the same core `tex.dll`. The same trick has been used for the `mktex*.exe` family of programs which are linked to the `mktex.dll` library.

In fact, a generic tool called `lnexe.exe` is provided to build the equivalent of Unix hard links for executable files only under Win32.

3 Binary distribution

3.1 What to get ?

Currently, this 0.4 version is not yet packaged for distribution. There is a new installer under construction called `TeXSetup.exe` dedicated to the TeX-Live and to fpTeX that will have interesting features :

- XML/RDF descriptions of the packages,

- database of installed packages,

- live upgrade of installed packages though the internet.

The first release of this new setup program is available on the TeX-Live 5a, 5b and 5c CD-ROMs. It is not yet completed, but future versions are expected soon.

3.2 How to install it ?

Jusr run `TeXSetup.exe` from your temporary directory. Next follow the instructions. Here are some hints:

Welcome Page: the description of the available packages is read, it can take time on a slow machine. Check the "Quick Install" if you want to proceed without any further question; TeX will be installed with the recommended setup, and all default options.

Root Page: Choose a *root* for your installation, `c:\Local\TeX` is proposed by default, but you can change it because you will need a lot of disk space: more than 300Mb for a full installation, and beware to the cluster size on FAT partitions that will make the package to appear even bigger – see section 2.4.

You can use a path with embedded 'space' character like `c:\ProgramFiles\TeX` instead the default `c:\Local\TeX`: TeX will understand it from this version, but it is safer to avoid this[6].

This path name will become you `<root>` directory.

The "Browse" facility won't be available on older platforms on which it is not implemented. The disk space requirements take your cluster size in account.

Setup Type Page Choose any setup type you want. You will be able to rerun `TeXSetup` to add packages later on if needed. You can use you CD-ROM as source of files that you did not install at first. You can even choose a minimalist setup where everything runs from the CD-ROM.

"Source Files" and "Documentation Files" refer mostly to LaTeX packages. You will have the general and fpTeX specific documentation even if you do not check the box.

You can choose to do the setup only for the current user or for all users, assuming you are running on an Administrator account under Windows NT. *It is recommended to run the setup from an Administrator account.*

Directories Page Only if you choosed a "Custom" setup type, you will be presented with this page.

You have the opportunity to custimize your `texmf` trees:

---

[6]TeX will understand, but not all support programs have been carefully checked against this kind of path names.

- The *local* `texmf` tree, which is designated by the variable `$TEXMFLOCAL` and is assigned the default value of `<root>/texmf-local`. It is intended to store your site local macros and style files.

- The *extra* `texmf` tree, which is designated by the variable `$TEXMFEXTRA` and is empty by default. It is intended to access some other `texmf` tree, like the TEX-Live CD-ROM for example;

- The *home* `texmf` tree, which is designated by the variable `$HOMETEXMF` and is assigned the default value of `$HOME/texmf`. It is meaningful only under Windows NT, where users have a `$HOME`. Usually, Windows 9x users do not have a `$HOME`, so should leave this place empty.

- the *variable* `texmf` tree, which is designated by the variable `$VARTEXMF` and is assignated the default value of `<root>/texmf-var`. It will hold all configuration information. The configuration files will be copied there at setup time, and it is intended that the forthcoming `TeXConfig` uses this place too.

- the *variable fonts* `texmf` tree, which is designated by the variable `$VARTEXFONTS` and is assigned the default value of `<root>/texmf-var/fonnts`. It will hold all of the locally generated font files.

These locations can be edited manually by looking for their variables names in the file `texmf-var/web2c/texmf.cnf`.

Package Selection Page Only if you choosed a "Custom" setup type, you will be presented with this page.

You are presented with a tree view of the collections and packages. You must choose which one you want to install and at which level. Clicking on the global set, or on any collection makes the selection rotate through "Basic", "Recommended", "Full" and "None". Clicking on an individual package make it selected or unselected. If your selection for a collection does not fit the predefined schemes, the collection is in the "Custom" state. You can click again on the collection to make it enter one of the predefined states.

Supplementary Page You will be offered to install packages that either have restricted licence, either are not strictly speaking part of TEX, but are useful.

Review Your Settings Page is your last chance to backup and change your selection.

File Copy Page The files will be copied to your hard disk. If you asked for packages available from the internet, they will be downloaded and installed. If you ask for a CD-ROM setup type, this stage will be very quick; if you asked for a full setup type, it might be quite long.

Configuration Page Some of the packages installed need that their configuration files be edited. For most of them, the `TeXSetup` program will do it for you.

Finish or Reboot Page Depending if you are running Windows 9x or Windows NT, you may be asked to reboot or not. It should not be needed under Windows NT, and I had prefer to avoid it. But the documented method to propagate environments variable into the system seems to fail sometimes. So it might be safer to reboot anyway, even under Windows NT.

A number of items will have appeared under the `Start->Programs->TeXLive` menu.

All relevant information about the installation will be logged in a (somewhat) huge file. This log file is located:

- either under the directory `config` at the root of your installation if you choose to install on your hard disk,

- in the Windows TEMP directory if you choose to run from CD-ROM.

In case of problems during the installation, thanks to read this file, and if you are unable to locate the source of your problems, please send an email to Fabrice.Popineau@supelec.fr describing precisely your configuration and problems. Don't send the log file at first, but keep it handy and zip it if it is requested.

3.3   Uninstalling and other options

Uninstallation is handled by a shortcut available from the `Start->Programs->TeXLive` menu.

The `TeXSetup` program has a number of other interesting options. You can get the list by running :

`c:\>TeXSetup --help`

Here is the description :

`--automatic-reboot` reboot without waiting user confirmation once installation is over;

`--dry-run` do nothing, just log everything that will be done without this option;

`--quick` use the recommended installation and default directories, ask nothing up to rebooting;

`--net-download` enable to download components whith restricted licenses from the net: you need to have an available network connection and some of the packages are huge;

`--source-directory<dir>` this is by default the parent directory of the one from where `TeXSetup` is run, if you ever upgrade `TeXSetup`, you won't be able to copy the new version to your CD-ROM, so you will need to use this option;

`--installation-directory<dir>` this is the root of your installation, all files will be copied under this location. The default value is `c:\Local\TeX`;

`--with-source` copy the source files for TeX packages;

`--with-doc` copy documentation files for TeX packages. Beware: this is only documentation about specific packages, geenral documentation will be installed anyway;

`--program-folder<folder>` the name of the folder under which you will find the menus;

`--add-package<pkg>` this is used to add a specific package after a first (not full) installation;

`--uninstall` this option will remove anything TeX related coming from the CD-ROM, which means there can be files left if you added style files or format files, and also that supplementary tools will not be removed[7]...

`--help` this option opens up a box with the list of options.

---

[7]This option is a bit crude as of June 17, 2000

3.4   Supplementary tools

3.4.1   Text editors

A number of editors are offered to drive TeX:

GNU Emacs The one true editor – at least from the point of view of Richard Stallman. The fine point with it is that it comes completely preconfigured with AUC-TeX, and for ISpell use. Available from the CD-ROM.

XEmacs If you have a really good internet connection, you can try to download this one (around 40Mb). This is much fancier than the GNU version.

WinEdt A full featured, shareware text editor to download from the internet (2.5Mb).

PFE A small text editor, easy to use and to program. Available on the CD-ROM.

WinShell See http://www.winshell.de for details. Available from the CD-ROM.

TeXShell A small, very basic text editor for TeX.

3.4.2   Other tools

There are two sets of graphics converters offered:

ImageMagick from http://www.wizards.dupont.com/cristy/ImageMagick.html, to be downloaded from the internet,

NetPBM which is an old collection of programs to manipulate and convert image files of various formats (available on the CD-ROM).

Those converters are usable by themselves, but they are also needed by TeX4ht, the TeX to HTML converter.

The French package, due to its restricted license is only available through Internet download.

The Postscript utilities, best known as PSUtils by A. Duggan are available on the CD-ROM too.

The free versions of Ghostscript (5.50) and Ghostview (2.7) are available from the CD-ROM. The non-free versions (Ghostscript 6.01 and Ghostview 3.0) are available from the Internet.

Last a Perl package (version 5.6, 22Mb) is available for download.

3.5   Testing the installation

A valuable tool to test the installation now is the program `kpsewhich`.

As a first step, you should check if Web2C correctly identifies the location of your texmf tree. Open a command prompt window and type

```
kpsewhich -expand-path=$TEXMF
```

The answer should be the location of your texmf trees (e.g. `c:/Local/TeX/texmf` if you unpacked the archive files as in the example above–note that the answer is a Unix style path, i.e. the DOS style `\\` is substituted by `/`; you don't have to worry about this).

Given a root directory `prefix` (`c:/Local/TeX` was my compile-time default), we have default locations as follows:

```
<prefix>/          installation root (c:/Local/TeX , compile-time default)
. bin/win32        executables
. man/             man pages
. info/            info files
. lib/             libraries (kpathsea.*)
. texmf/           TDS root
. . web2c/         implementation-dependent files
                   (.pool, .fmt, texmf.cnf, etc.)
```

This layout is identical to the standard one for teTEX under Unix and follows the TDS specification.

You can always check if kpathsea finds a specific file by typing

```
kpsewhich <filename>
```

A typical example would be

```
d:\>kpsewhich cmr10.mf
d:\>c:/Local/TeX/texmf/fonts/source/public/cm/cmr10.mf
```

4 Configuration

4.1 Intended use

There is a dialog based `texconfig` tool being devised. But it is not yet usable. I hope it will help in configuring various parts of the system. In the mean time, here are some piece of advice in making fpTEX more usable and easily upgradable.

4.2 Local stuff

If you want to store local stuff like additional style files, you may store them in the main texmf tree. But there are some reasons why this isn't a good idea. The most important is that it may cause problems if you make an update of your Web2C distribution since you will have to look properly what files were changed or added by you. The main texmf tree should not be clobbered by foreign files.

So, the best place to keep your additional stuff is the local texmf tree, which is `<root>` `/texmf-local` by default, and which value you can retrieve by typing in a command prompt:

```
c:\>kpsewhich --expand-var $TEXMFLOCAL
c:/Local/TeXLive/texmf-local
```

There are two conditions to fulfill :

1. your files must be set up in a way that is TDS compliant. See the tds document for more details. If you want to add local LATEX classes, you must put them under `$TEXMF/tex/latex/myclasses/` *because the default search path for LATEX is set up this way.* And please, do not edit the `texmf.cnf` file to change the search paths: it is risky business;

2. you need to rebuild the `ls-R` databases, either by running `mktexlsr` on a command prompt, or by choosing the appropriate menu from `Start->TeXLive->Maintenance`.

If you have a look at the definition of `$TEXMF`, you will find something more or less like:

```
TEXMF={$HOMETEXMF,!!$TEXMFVAR,!!$TEXMFLOCAL;!!$TEXMFMAIN}
```

This setting means, that Web2C will first look for files in your home texmf tree, then in your variable texmf tree, then in your local texmf tree and then in the main texmf tree. The exclamation marks (!!) indicate that Web2C will use the file database for this texmf tree to find files. For this reason, don't forget to run `mktexlsr` to update the file database if you install additional files in your local texmf tree.

4.3 Having multiple users

The best way is to have a home texmf tree for every user. Create a home texmf tree for the user, e.g. `c:\donald\texmf` for user Donald. Under Windows NT, it is assumed that `c:\donald` is user Donald's home directory. Windows 9x users usually do not have home directories.

Copy the file `c:\Local\TeX\texmf\web2c\texmf.cnf` into the web2c directory of the local texmf tree for the user, e.g. `c:\donald\texmf\web2c`.

Change this local copy of the file `texmf.cnf` to use the local texmf tree as explained in section 4.2. Uncomment the line setting the `HOMETEXMF` variable and set it to :

```
HOMETEXMF=c:/donald/texmf
```

and modify `TEXMF` to reference it :

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

It is not mandatory to put `!!` in front of `HOMETEXMF`, because you are not supposed to store thousands of files there. Would you require that only `ls-R` database be searched, you will need to build it using either the `mktexlsr` command or the shortcut in the fpTEX menu.

Set the environment variable `TEXMFCNF` to the local texmf tree of the user, e.g.:

```
TEXMFCNF=c:\donald\texmf\web2c
```

4.4   Configure the way web2c generates fonts

Warning : this should not be needed anymore since then new default configuration should be suitable for most uses.

Web2C uses `mktex` programs to build missing fonts. The most important one is `mktexpk` that is called by the dvi drivers like `windvi` or `dvips` to generate pk files for missing fonts (see the `mktexpk` manpage for further informations about mktexpk).

Let us first discuss where generated `pk` files are stored. By default, `mktexpk` stores the font in

```
c:\Local\TeX\texmf\fonts\pk\mfmode\supplier\typeface\fontname.xxxpk
```

where xxx is the resolution of the font and the values for supplier and typeface are taken from the path of the `mf` file that was used to generate the `pk` file.

Examples:

C:\TeX\texmf\fonts\source\public\cm\cmr10.mf

Supplier = `public`; typeface = `cm`

C:\TeX\texmf\fonts\source\jknappen\ec\ecrm1000.mf

Supplier = `jknappen`; typeface = `ec`

You can configure where the mktex programs will place the produced files by setting the `MT_FEATURES` variable in the file `mktex.cnf`. The following settings are allowed:

dosnames The `pk` files are stored as `dpixxx\fontname.pk` instead of `fontname.xxxpk`. This setting is valuable on systems that have problems with long filenames or if you are using a DVI previewer that expects filenames in DOS like 8+3 syntax (e.g. dviwin) `stripsupplier`

striptypeface Suppress the storage of the fonts in a subdirectory with the name of the supplier or the typeface, respectively.

varfonts The `pk` files will be stored in the directory tree defined by the `VARTEXFONTS` setting in the file `texmf.cnf` instead of the texmf tree. This is the default if the font directory in the texmf tree is write protected.

Important note: Be sure to set the VARTEXFONTS variable to a proper setting if you use this feature. For this edit the file `texmf.cnf` (you can use `kpsewhichtexmf.cnf` to find out where it is located, normaly in `...\texmf\web2c`), find the line where VARTEXFONTS is defined (`VARTEXFONTS=...`) and set it to the proper directory. One interesting directory to set `VARTEXFONTS` to is `$TEXMFLOCAL/fonts`. This way, all users at your site will share generated fonts files.

To change the `MT_FEATURES` setting proceed as follows.

1. Edit the file `mktex.cnf` (normally located in `texmf-var/texmf/web2c`, otherwise use `kpsewhich mktex.cnf`). The syntax for the `MT_FEATURES` setting is

   ```
   : ${MT_FEATURES=setting1:setting2:setting3}
   ```

   The line must begin with `:`.

2. Create a dummy file named `mktexnam.opt`. Open a command prompt window, change the current directory to `c:\Local\TeX\texmf\web2c` and type

   ```
   c:\Local\TeX\texmf\web2c> copy con mktexnam.opt
   ^Z
   ```

   Here the term `^Z` means typing `<Control>+Z`.

3. Don't forget to rerun `mktexlsr` to update the file database.

4.5   Configure dvips

Dvips is configured using the file `config.ps`. You will find it in `...\dvips\base` (if you change this file, it may be a good idea to store it in a local texmf tree—see section 4.2—so that the changed file isn't replaced by the default `config.ps` if whenever you update the distribution. Don't forget to rerun `mktexlsr` if you do this).

You should perform the following setting in `config.ps`:

Set up the METAFONT mode and the resolution of the default printer:

```
M mfmode
D resolution
```

Just find these two lines in `config.ps` and set them to proper values.

Note: If you are using different printers you can simply create a file `config.printer` for each printer including the definition of METAFONT mode and resolution and call **dvips** by

```
dvips -Pprinter
```

what tells dvips to use the configuration file `config.printer`.

Find the line

```
o
```

This line means that dvips will generate a Postscript file by default. You can here specify UNC names for your printer in the form of

```
o \\server\printername
```

`config.ps` contains several definitions for paper sizes. For example, the definition for A4 reads as follows:

```
@ A4 210mm 297mm
@+ ! %%DocumentPaperSizes: A4
@+ %%BeginPaperSize: A4
@+ a4
@+ %%EndPaperSize
```

Dvips uses the first defined papersize as default (after unpacking the distribution files this will be letter). If you want to use A4 as default you have to move the definition for A4 before the definition of letter. If you want to add other papersizes you can do this by following the scheme given above. Note: You can dvips to use another papersize as the default by

```
dvips -tpapersize
```

(where papersize is the name of one of the papersizes defined in `config.ps`). You can also use

```
dvips -tlandscape
```

to switch to landscape mode.

You can also control which fontmaps are used by dvips. If dvips converts a DVI file to Postscript, it has to decide wether a font is a PS Type 1 font or not. If yes, dvips has to translate the name of the font used by TeX to the Postscript name–and to include the outline of the font (normally a `pfb` file) unless the font is resident to the printer as for various Adobe standard fonts; if not, dvips has to include a `pk` file for the font (this is why you should define the correct METAFONT mode and resolution for your printer in `config.ps`). To decide, wether a font is a PS Type 1 font, it will use by default the fontmap `psfonts.map`. If a font is included in `psfonts.map`, dvips knows that the font is a PS Type 1 font, if not it will use a `pk` file for the font–and call mktexpk to generate one from the METAFONT source, if it doesn't exist.

You can configure dvips to use another fontmap `foo.map` instead of `psfonts.map` by including the line

```
p foo.map
```

in `config.map` or to use `foo.map` additionally to `config.ps` by the line

```
p +foo.map
```

4.6   Network installation

Applying the previous hints, you can devise your own network installation quite easily.

All the support files, everything except the files in the `bin/win32` are shareable with a teTeX or Unix TeX-Live installation. That means you can use samba either to mount from a Windows NT server to a Unix workstation or the converse. Several strategies are possible:

- Put everything on the server. Just add each set of files for the os and architecture you want to use in the `bin` directory. That means for example `bin/win32` and `bin/i386-linux-elf`. Next configure your main variables as explained previously. You can use UNC names to point to the right directories under Win32.

- Install a local copy for the binaries and format files. In this case, assign `$TEXMFMAIN` to the main `texmf` tree that will lie on the network.

These schemes should have been handled by the InstallShield installer. But so many problems rose up with this installer that these features have been delayed to the next version of the setup program.

5 Troubleshooting

What to do if `kpsewhich` or `latex` does not find your files?

- kpsewhich is the tool of choice to debug any problem. Unfortunately, kpsewhich outputs debug information to stderr, and the Windows console does not know how to redirect stderr to a file. So you will need to play with the 'pause' key until someone provides me with a better approach.

- assuming the installation has been done in `c:/Local/TeX`, check the following values:
  ```
  kpsewhich-expand-path$SELFAUTOPARENT   c:/Local/TeX
  kpsewhich-expand-path$TEXMF            c:/Local/TeX/texmf
  kpsewhich-expand-path$TEXMFCNF         .;c:/Local/TeX/texmf/web2c;
                                         c:/Local/TeX/bin/win32;
                                         c:/Local/TeX/bin;
                                         c:/Local/TeX
  kpsewhich-expand-var$TEXINPUTS         .;c:/Local/TeX/texmf/tex//
  ```

- if you have other TeX-related values already set in your environment, please, remove them. They are overriding the ones in texmf.cnf.

- check the values from:
  ```
  kpsewhichcmr10.tfm   c:/Local/TeX/texmf/fonts/tfm/public/cm/cmr10.tfm
  kpsewhichlatex.fmt   c:/Local/TeX/texmf/web2c/latex.fmt
  ```

- at this point, if everything is correct, `tex.exe` and co. should work. If it is not the case, you will need to play with the `-debug=n` option from `kpsewhich`, and check back all the values. Try to identify and report the problem.

6   Filesystems considerations

Win32 supports multiple filesystems:

- DOS FAT, 8.3 and uppercase filenames

- Protected mode Fat, long filenames, but case-insensitive

- NTFS, long filenames and case-sensitive

- ISO9660 CDROM, 8.3 and uppercase filenames

Moreover, Win32 calls which refer to filenames are case-insensitive. There are several other features in NTFS that Win32 can't use for the moment. Another dimension is the use of different directory separators: / or \, but Win32 calls accept both.

So what difficulties may arise ?

Most likely, you will have some style files with long filenames. If you are running on a filesystem which supports them[8], there is no problem and you have nothing to do. Otherwise, you will need to use the alias feature of kpathsea (Refer to the kpathsea manual). Say for example you are trying to install texmf on a FAT partition and you have the style file named longtable.sty in you tree. The filename will be truncated to its 8.3 form : longtabl.sty. In this case, you will need to create a file named aliases along to the ls-R file in you texmf tree. This file should contain the following line:

```
longtabl.sty longtable.sty
```

There is an example of aliases file in `$TEXMF/aliases`. All references to longtable.sty will be redirected to longtabl.sty as long as the long filename is not found.

Otherwise, if you think you have trouble with filenames, consider doing the following:

- paths in config files and environment variables are preferred written with / rather than \;

- ls-R databases should be in lower case, even if you are running on FAT or CD-ROM;

- use the debug feature of `\kpathsea{}` and `kpsewhich` to demonstrate you problem and email me the results of your investigations.

---

[8]By example, NTFS but not FAT !

7 Other documentation

Here are some files describing more precisely different parts of the system. You can find extensive documentation on the following subject by clicking on the links :

Kpathsea kpathsea.pdf

Web2c web2c.pdf

TDS tds.pdf

Dvips dvips.pdf

Windvi windvi.pdf

8 How to build fpTEX?

Almost all the patches to the source code of teTeX have been integrated in the main ditribution. There is work in progress to have a repository of the source code widely accessible, but this is not so easy to maintain, mainly because the distribution is huge. Currently, not all the support files I am using are available, but you might be able to compile everything found in teTeX.

Generally speaking, I will not support fpTEX at the source level, although people wanting to enhance it are welcome. Unix uses `autoconf` and has only `Makefile.in`. I have to tweak these `Makefile.in` by hand to get them working. And I had to compile a lot of GNU stuff to make this running. I have taken the others (groff for example) from the Net.

9 HOWTO

9.1 Add some directory to your PATH

The procedure for this is different between Windows 95 and NT:

Windows 95 Edit your `autoexec.bat`. In this file should be a line starting with `PATH=` and followed by a list of directories separated by `;`. Please add the directory with the executables in this line. After this, this line could look as follows: set

```
PATH=c:\windows;c:\windows\system;c:\Local\TeX\bin\win32
```

Windows NT 4.0 Click left on `Start -> Settings -> Control Panel`. Now the window with the control panel icons opens. Double click on System. The System Properties window opens. Click on the tab Environment. Now you can change the environment variables for your user account Note: There are also displayed the environment settings for the system. Normally, you can't change the system variables unless you have administrator rights on your machine. If you want to change the `PATH` for all users, you will have to contact your system administrator or be the system administrator yourself–in the later case you should know what you are doing.

If there is already a `PATH` setting for your user account, left click on `PATH`. In the field Variable appears `PATH` while the field Value shows the current setting of `PATH` as a list of directories separated by `;`. Add the directory where the executables are located (e.g. `c:\Local\TeX\bin\win32`). If there isn't a `PATH` variable for your user account, symply click in the field Variable and type in `PATH`, click in the field Value and type in the directory with the executables. Important: Click on the Apply button before clicking Ok, otherwise the changes to `PATH` won't apply to your system. Be careful when changing the environment settings.

9.2 Generate PDF files from my LaTeX files ?

You have 2 tools to do this:

1. PDFTEX which is a modified TEX engine that writes PDF instead of DVI files,

2. Dvipdfm which takes your DVI files and convert them to PDF.

9.3 Generate HTML files from my LaTeX files ?

The TEX4ht converter is provided. Its use is documented in the *Web Companion Book.*

10 Obtaining software

10.1 CTAN

CTAN is the Comprehensive TeX Archive Network, a network of ftp servers where you can get (almost) every thing that is related to TeX. CTAN has three backbones

Germany `ftp://ftp.dante.de/tex-archive/`

UK `ftp://ftp.tex.ac.uk/tex-archive/`

USA `ftp://ctan.tug.org/tex-archive/`

and several mirrors. You can obtain a list of the current CTAN mirrors as
`ftp://ctan.tug.org/tex-archive/CTAN.sites`

Many of the servers (and at least the backbones in Germany and the UK) support compression on the fly, i.e. you can download the contents of a directory and all its subdirectories as a `.zip` of `tar.gz` file. Simply add the suffix `.zip` of `.tar.gz` to the URL of the directory to download.

There is also a searchable index for CTAN at
`http://ctan.tug.org/cgi-bin/ctan-web-search`
and
`http://www.dante.de/cgi-bin/ctan-index`

10.2 Where to get fpTEX

fpTEX is available from CTAN in the directory :
`ftp://ctan.tug.org/tex-archive/systems/win32/fptex/`
or from
`ftp://ftp.ese-metz.fr/pub/tex/win32/`
which is mirrored daily by the CTAN backbones in their `systems/win32/fptex` directory.

The `fptex` directory contains also additional tools like psutils, `gnutools`, `perl` and the files necessary to set up LaTeX2HTML.

Beta versions of fpTEX are available from
`ftp://ftp.ese-metz.fr/pub/tex/win32-beta/`

10.3 Documentation on LaTeX

You will find a nice free documentation on LaTeX with the title The Not So Short Introduction to LaTeX2e on CTAN in the directory :
`ftp://ctan.tug.org/tex-archive/info/lshort`.

This introduction is available as dvi, Postscript and pdf file. There is also a German version in the directory :
`ftp://ctan.tug.org/tex-archive/info/LaTeX2e-Kurzbeschreibung`.

Of course, there are various books available on LaTeX. For beginners, you might take a closer look to
L. LAMPORT *LaTeX: A Documentation Preparation System User's Guide and Reference Manual*
H. KOPKA and P.W. DALY *A guide to LaTeX2e*
For more advanced users, the following books will be of valuable help:
M. GOOSSENS, F. MITTELBACH and A. SAMARIN *The LaTeX companion*
M. GOOSSENS, S. RAHTZ and F. MITTELBACH *The LaTeX graphics companion*

10.4   Important LaTeX macros on CTAN

LaTeX-base ftp://ctan.tug.org/tex-archive/macros/latex/base/

tools package ftp://ctan.tug.org/tex-archive/macros/latex/packages/tools/

graphics package ftp://ctan.tug.org/tex-archive/macros/latex/packages/graphics/

psnfss package ftp://ctan.tug.org/tex-archive/macros/latex/packages/psnfss/

babel package ftp.//ctan.tug.org/tex-archive/macros/latex/packages/babel/

Various other LaTeX packages are available from CTAN in the directories
ftp://ctan.tug.org/tex-archive/macros/latex/contrib/supported/
or
ftp://ctan.tug.org/tex-archive/macros/latex/contrib/other/

10.5   Info-Zip

The Info-Zip archive tools zip and unzip for compression and uncompression are available from
the Info-Zip homepage
http://www.cdrom.com/pub/infozip
or
http://sunsite.cnlab-switch.ch/ftp/mirror/infozip/
(European mirror)
    or from CTAN in the directory
ftp://ctan.tug.org/tex-archive/tools/infozip/
There is also a GUI based variant of zip/unzip called wiz in the same directory.

10.6   Ghostscript and GSView

You can obtain ghostscript (a Postscript interpreter) and GSView (a user-friendly frontend for
ghostscript) from the ghostscript homepage
http://www.cs.wisc.edu/~ghost/index.html
    or from CTAN in the directory
ftp://ctan.tug.org/tex-archive/support/Ghostscript/Aladdin/ (ghostscript)
and
ftp://ctan.tug.org/tex-archive/support/Ghostscript/rjl/ (GSView)
    You will need the files
gs550w32.zip
gs550ini.zip
gs550fn1.zip (all from the Aladdin directory) and
gv26w32.zip (from the rjl directory)

11 Acknowledgements

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First of all, many thanks to the following people for their patience and good will:

- Karl Berry, and now Olaf Weber, for their work on Web2C, and for accepting my Win32 patches

- Michael Basler, Tobias Burnus, Daniel Courjeon, Michael C. Grant, Klaus Höppner, Brian Ripley, and the long list of beta-testers for their helpful remarks,

- Sebastian Rahtz, also for intensive tests and for integrating this port into the TEX-live CD,

- Thomas Esser for the wonderful teTEX distribution, which fpTEX tries to mimic as best as possible,

- Phil Taylor, Bernd Raichle and the NTS team for e-TEX which is included in this release,

- Joachim Schrod and Pehong Chen for `makeindex`, which I have adapted to `kpathsea`,

- Han The Thanh for PDFTEX which is also included in this release,

- John Plaice and Yannis Haralambous for Omega,

- John Hobby for MetaPost,

- authors of the numerous tools that I have added to the distribution: makeinfo, ps2pk, t1tools, dtl, dviconcat, dvicopy, dvidvi …

- The new installer is based on code from 3 sources : Christian Schenk setup wizard for his MiKTeX distribution, WFC code by Samuel R. Blackburn and Microsoft MSDN examples; I'm thankful to them.

Listing of the full binary TEX distribution

```
Volume in drive D has no label.
Volume Serial Number is ECE6-7035

Directory of d:\Local\TeXLive\bin\win32

[.]                [..]               a5bookle.bat       access.exe
afm2tfm.exe        amstex.bat         bg5conv.exe        bg5latex.bat
bibtex.exe         bibtex8.exe        buildhash.exe      bz2lib.dll
bzip2.exe          bzip2recover.exe   cef5conv.exe       cef5ltx.bat
cefconv.exe        cefsconv.exe       cefsltx.bat        ChkTeX.exe
cjpeg.exe          cont-de.exe        cont-en.exe        cont-nl.exe
cslatex.bat        cslatexd.bat       cslatexi.bat       cslatexk.bat
csplain.bat        csplaind.bat       csplaini.bat       csplaink.bat
disdvi.exe         djpeg.exe          dmp.exe            doubside.bat
dt2dv.exe          dv2dt.exe          dvi2tty.exe        dvibook.exe
dviconcat.exe      dvicopy.exe        dvidvi.exe         dvihp.exe
dvilj.exe          dvilj2p.exe        dvilj4.exe         dvilj4l.exe
dvilj6.exe         dvipdfm.exe        dvips.exe          dviselect.exe
dvitodvi.exe       dvitomp.exe        dvitype.exe        e2pall.exe
e2pall.pl          ebb.exe            einitex.exe        elatex.exe
eplain.bat         epsffit.exe        epstopdf.exe       epstopdf.pl
etex.dll           etex.exe           evirtex.exe        extractres.bat
fixdlsrps.bat      fixfmps.bat        fixmacps.bat       fixpsditps.bat
fixpspps.bat       fixscribeps.bat    fixtpps.bat        fixwfwps.bat
fixwpps.bat        fixwwps.bat        fmtutil.exe        frlatex.bat
frtex.bat          f_name.bat         getafm.exe         gftodvi.exe
gftopk.exe         gftype.exe         gsftopk.exe        gunzip.exe
gzip.exe           hbf2gf.exe         ht.exe             htlatex.exe
httex.exe          httexi.exe         hugelatex.exe      hugetex.exe
```

25

```
icombine.exe      ijoin.exe         includeres.bat    inimf.exe
inimpost.exe      iniomega.exe      initex.exe        install-info.exe
ispell.exe        jadetex.exe       jpeg2ps.exe       jpegtran.exe
kpathsea.dll      kpsestat.exe      kpsewhich.exe     lacheck.exe
lambda.exe        latex.exe         libgifreader.dll  libjpeg.dll
libpng.dll        libtiff.dll       libttf.dll        lnexe.exe
ltx2rtf.exe       mag.exe           makeindex.exe     makeinfo.exe
makempx.exe       mex.exe           mf.dll            mf.exe
mft.exe           mfw.dll           mfw.exe           mktex.dll
mktex.exe         mktexdir.exe      mktexlsr.exe      mktexmf.exe
mktexnam.exe      mktexpk.exe       mktextfm.exe      mktexupd.exe
mllatex.bat       mltex.exe         mpost.dll         mpost.exe
mpto.exe          musixflx.exe      newer.exe         odvicopy.exe
odvips.exe        odvitype.exe      ofm2opl.exe       omega.dll
omega.exe         opl2ofm.exe       otangle.exe       otp2ocp.exe
outocp.exe        ovf2ovp.exe       ovp2ovf.exe       owindvi.exe
patgen.exe        pdfclose.exe      pdfcslatex.bat    pdfcslatexd.bat
pdfcslatexi.bat   pdfcslatexk.bat   pdfcsplain.bat    pdfcsplaind.bat
pdfcsplaini.bat   pdfcsplaink.bat   pdfeinitex.exe    pdfelatex.exe
pdfetex.dll       pdfetex.exe       pdfevirtex.exe    pdfimages.exe
pdfinfo.exe       pdfinitex.exe     pdfjadetex.exe    pdflatex.exe
pdfmex.exe        pdfopen.exe       pdfplatex.exe     pdftex.dll
pdftex.exe        pdftexinfo.exe    pdftops.exe       pdftosrc.exe
pdftotext.exe     pdfvirtex.exe     pdfxmltex.exe     pfb2pfa.exe
physe.bat         phyzzx.bat        pk2bm.exe         pktogf.exe
pktype.exe        platex.exe        pltotf.exe        png2pnm.exe
pnm2png.exe       pooltype.exe      ps2pk.exe         psbook.exe
psmerge.bat       psnup.exe         psresize.exe      psselect.exe
pstops.exe        rdjpgcom.exe      regex.dll         rpng.exe
rpng2.exe         runht.exe         runperl.exe       sjisconv.exe
sjisltx.bat       sq.exe            t1ascii.exe       t1asm.exe
t1binary.exe      t1disasm.exe      t1mac.exe         t1unmac.exe
t4ht.exe          tangle.exe        tex.dll           tex.exe
tex4ht.exe        texexec.exe       texexec.pl        texhash.exe
texi2html.exe     texi2html.pl      texindex.exe      texinfo.exe
texshow.exe       texshow.pl        texsis.bat        text1.bat
texutil.exe       texutil.pl        tftopl.exe        thaiconv.exe
thumbpdf.exe      thumbpdf.pl       tie.exe           tiff2png.exe
ttf2afm.exe       ttf2pfb.exe       ttf2pk.exe        ttf2tfm.exe
ttfdump.exe       unsq.exe          vftovp.exe        virmf.exe
virmpost.exe      viromega.exe      virtex.exe        vptovf.exe
weave.exe         windvi.exe        wpng.exe          wrjpgcom.exe
xmltex.exe        zlib.dll
            264 File(s)     11ÿ896ÿ900 bytes
              2 Dir(s)     462ÿ053ÿ376 bytes free
```