

fpT_EX 0.4

Fabrice Popineau
fabrice.popineau@supelec.fr

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1 Foreword

1.1 Acknowledgements

This \TeX distribution is not the result of my sole work, but rather from the work of many people. It will be difficult to list all of them, but I can always name the most important ones.

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

Thomas Esser for his outstanding $\text{te}\text{\TeX}$ distribution, from which I imported many ideas, and with which I try to stay compatible as much as possible.

Sebastian Rahtz for assembling the \TeX -Live CD-ROM. Sebastian has done a great job at automating the build of the most complete texmf tree and maintaining it. He also included all my Win32 binaries of his CD-ROM. I owe much to him.

Erick Frambach and Wietse Dol for having integrated this distribution into their 4All \TeX CD-ROM.

Many people helped by their reports to test and debug the distribution. Among them are Michael Basler, Tobias Burnus, Daniel Courjeon, Michael C. Grant, Klaus Hppner (who wrote some bits of this documentation), Brian Ripley, and many others.

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

Last, I must grant credit to the authors of the numerous packages that are included in the distribution. Many of these packages have had many authors or maintainers as years pass, and I won't trace each of them. However, it was a pleasure receive support from – and maybe give some too - a few people:

- Phil Taylor, Bernd Raichle and the NTS team for $\text{e}\text{\TeX}$ which is included in this release,
- Han The Thanh for PDF \TeX which is also included in this release,
- John Plaice and Yannis Haralambous for Omega,
- authors of the other numerous tools that are in the distribution: dvipsk , dviptfm , makeinfo , ps2pk , t1tools ...

1.2 What is $\text{fp}\text{\TeX}$?

In a word, $\text{fp}\text{\TeX}$ is a *free* port to the various flavours of Windows – Win95, Win98, NT and Windows 2000 referred to as Win32 – of the well known distribution $\text{te}\text{\TeX}$ for Unix.

More precisely, given obvious differences between Unix and Win32, some things behave differently under $\text{fp}\text{\TeX}$: some are still missing, some are just different, but the large majority behave just the same as under Unix. See section 4.2 for more details about the programs.

1.3 Why use $\text{te}\text{\TeX}$ under Win32

The $\text{te}\text{\TeX}$ distribution is based on Web2C.

Web2C by itself is a translator from the Pascal language to the C language. D.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 ??.

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 $\text{T}_{\text{E}}\text{X}$ distribution in the Unix world, and the one on which many developments are based. Web2C takes you to a high level of $\text{T}_{\text{E}}\text{X}$ nicity : latest versions of $\text{T}_{\text{E}}\text{X}$, 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 OS¹, 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) $\text{T}_{\text{E}}\text{X}$ 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 18.

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

2 Roadmap

This is not my intention to rewrite an extensive documentation about how to use a \TeX system: there exists many books and documents on the subject and some of them are packaged in the distribution, like “The Components of \TeX ” and the “Gentle Introduction to \LaTeX ” that you can find in the `texmf/doc/guides` directory once everything is installed.

So, if you are new to this, please refer to these guides before going any further.

Rather, I will try to focus on the specific features to Win32 of $\text{fp}\text{\TeX}$. This means that whenever there are common features with Web2C or $\text{te}\text{\TeX}$, I will refer to the appropriate document. You can already get a copy of the three following ones:

1. `texmf/doc/tds/tds.pdf` this is the reference for the layout (\TeX Directory Structure) of the numerous files in the system,
2. `texmf/doc/kpathsea/kpathsea.pdf` this one documents the behaviour of the main library in the system, and its configuration files,
3. `texmf/doc/web2c/web2c.pdf` this one documents the programs in the Web2C part of the system, ie mainly the engines.

You can find the HTML counterpart of these documents in `texmf/doc/html/tds/tds_toc.html`, `texmf/doc/html/tds/kpathsea_toc.html` and `texmf/doc/html/tds/web2c_toc.html` respectively.

This document should help you to download, setup and run the \TeX system on your computer. The roadmap will be as follows :

- some things to know about Win32 and that matters for $\text{fp}\text{\TeX}$
- where to download things and where to get new information
- how to setup the system
- some editors to use as \TeX drivers
- a few more things about the coompilers
- how to view your documents
- how to print them
- how to convert your files to other formats
- other useful tools
- some advice on how to maintain your installation
- what to do in case of trouble
- and an obligatory FAQ

3 Prerequisites

3.1 Different flavors of Win32

What we call Win32 is not an operating system by itself. It is a set of functions – and a large one² – 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 answer something like 'MS-DOS 7.0'(at least for the old versions of Windows 9x);
- 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.

3.2 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 interpreter.

But the problem here is more fundamental : \TeX is a *batch* tool. Not an interactive one. \TeX needs to compute 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 ??.

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 5.2.

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

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” menu³. You can also choose the “Start-¿Run” menu and type in `cmd.exe`, which is the name of the brand new command interpreter for NT⁴.

3.3 Path separators

The Win32 API understands both `/` and `\\` characters et PATH separators. But the command interpreters 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 compatibility: 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.

3.4 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 only⁵.

3.5 Environment variables

These are pairs of variables and values and behave much like global variables to your programs. The set of those variables is called the environment. Each program is initialized with a copy of the environment when it is run. It can request request and change the value of any variable. The changes happen in the copy of the environment, and is not at all propagated to the other running programs.

You modify the environment using two different methods, depending on whether you are under Win9x or NT:

Win9x Environment variables are stored in the `autoexec.bat` file. In this file, you will find commands like:

```
set VARIABLE=VALUE
PATH=...
```

which will initiate the environment with the given pair. The keyword `set` is needed, except for one special environment variable: `PATH`. This one does not need the keyword to be set.

³These locations may change across different OS versions.

⁴Which explains why it is untrue to call this a *DOS* box under NT!

⁵You can lower the limit to 512 bytes on NTFS

Given that any changes to the environment happens in the `autoexec.bat` file, the computer must be rebooted for that changes to be taken into account.

NT/2000 Environment variables are stored in the registry. You can add, remove or change them by going into the “Start menu”, “Settings”, “Control Panel”, choosing “System”, and then “Advanced” tab, next “Environment Variables”. Then you can edit two sets of variables: the ones that are available to all users – only if you have administrator rights, and yours. Given that modifications are done in the registry, there is an opportunity not to need to reboot the computer. Once you close the “System” applet, changes are propagated to the system so that any new program that will run will benefit from the changes. Beware: the program must run from the operating system itself, not from inside a console that would have been launched before the environment changes, else it would inherit the environment from the console, ie: the old one.

The best way to be sure that a variable has been properly set is to open a console and type:

```
set VARIABLE
```

which should return the corresponding value.

3.6 T_EX engines

If you have a look at the Web2C documentation, you will read that all the various T_EX 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 T_EX 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
```

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.

4 Availability

4.1 Where to get fp \TeX

You can find the fp \TeX home on the Web here:

<http://www.fptex.org/>

The current fp \TeX release is available from any CTAN (see also the section 4.4) site in the directory :

<ftp://ctan.tug.org/tex-archive/systems/win32/fptex/>.

The main ftp site for fptex is <ftp://ftp.dante.de/pub/fptex/> from where beta versions of fp \TeX and additional tools are available. This main site is mirrored (partly only!) daily by the CTAN backbones in their `systems/win32/fptex` directory.

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 fp \TeX . 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.

4.2 What's in this port

The distribution is made of the following binaries packages:

Programs using the kpathsea library	
T_EX 3.14159	the T _E X compiler
METAFONT 2.7182	the font compiler
MetaPost 0.641	graphic language along METAFONT style, produce nice postscript figures,
METAFONTware	support tools for METAFONT
T_EXware	support tools for T _E X
e-T_EX 2.1	the e-T _E X extension to T _E X
Omega 1.11	a T _E X extension towards Unicode (and much more)
pdfT_EX 0.14f	a T _E X compiler that can produce PDF
mktex*	support programs for generating missing font files, fntutil for building formats
BibT_EX 0.99C	the bibliography compiler
BibT_EX8 3.71	the same, but rewritten in C and designed for 8 bits character sets
ChkT_EX	a T _E X and L ^A T _E X 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 <i>LaserJet</i> printers
dvipdfm 0.12.8b	converts DVI into PDF format
dvipdfm 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 L ^A T _E X files without actually compiling them
ltx2rtf 4.3	converts L ^A T _E X 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 1.20	tools to assemble and disassemble Type 1 fonts
ttf2pfb, ttf2pk, ttfdump	a collection of tools to manipulate TTF fonts
T_EX4ht	converts T _E X or L ^A T _E X files to HTML
texinfo	the GNU technical documentation package relying on T _E X
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
ImageMagick	another collection of tools to handle, transform and convert graphic files of various format
TeXSetup	the setup program
EPS to PDF	converter using Ghostscript
Supplementary packages of interest	
Ghostscript and Ghostview	Postscript viewer system, comes in GPL'ed version and non-free (latest) version
NTEmacs 20.7	The Editor, preconfigured to run with AUC-TeX and



and the following style files packages:

To be complete, you will find in annexe 18 the rough listing of the complete binary distribution.

4.3 What to get ?

You need one of the following:

1. the files from:

```
ftp://ftp.dante.de/pub/fptex/0.4/TeXSetup.exe
ftp://ftp.dante.de/pub/fptex/0.4/tpm
ftp://ftp.dante.de/pub/fptex/0.4/zip
ftp://ftp.dante.de/pub/fptex/0.4/setupw32
```

You can grab all these files easily by retrieving successfully `wget.exe` and `getfptex.bat` in some temporary directory. Run this `.bat` file and it will download the needed parts.

2. an image of the current \TeX -Live CD-ROM, available from you LUG, from the TUG office or from CTAN in `systems/texlive`.

When you have one of these two sets of software, run the `TeXSetup.exe` program and refer to the section 5.

4.4 CTAN: obtaining other \TeX related software

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` or `tar.gz` file. Simply add the suffix `.zip` or `.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
```

5 Setup

Just 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 3.4.

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 this⁶.

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 your 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 $\text{fp}\TeX$ 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 customize your `texmf` trees:

- 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 assigned 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.

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

- 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 T_EX, 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 either under the `Start->Programs->TeXLive` menu or the `Start->Programs->fpTeX` 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.

5.1 Uninstalling and other options

Uninstallation is handled by a shortcut available from the `TeXLive` or `fpTeX` 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 with 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, general 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 removed7...
--help            this option opens up a box with the list of options.
```

5.2 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:

<code><prefix>/</code>	installation root (<code>c:/Local/TeX</code> , compile-time default)
<code>. bin/win32</code>	executables
<code>. man/</code>	man pages
<code>. info/</code>	info files
<code>. lib/</code>	libraries (<code>kpathsea.*</code>)

⁷This option is a bit crude as of September 18, 2000

```
. texmf/          TDS root
. . web2c/        implementation-dependent files
                  (.pool, .fmt, texmf.cnf, etc.)
```

This layout is identical to the standard one for $\text{te}\text{T}\text{E}\text{X}$ 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
```


6 Configuration

6.1 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.

6.2 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.

6.3 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 6.2. 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
```

6.4 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, normally 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.

6.5 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.

7 Editing



- 7.1 WinEdt
- 7.2 NTEmacs
- 7.3 XEmacs
- 7.4 WinShell
- 7.5 PFE
- 7.6 TeXShell

8 Compiling



9 Viewing

9.1 Viewing DVI files

The fpTeX viewer is called `Windvi` and is derived from the source code of `XDvi` .

9.2 Viewing PDF files

10 Printing

10.1 Printing from Windvi

Currently, Windvi is able to print using the unified printer driver from Windows. However, you need to specify some parameters on the command line at least once:

```
c:\>windvi -p 360 -mfmode deskjet foo.dvi
```

The METAFONTmode will be set to `deskjet` and the resolution to 360dpi. Look at the `texmf/metafont/misc/modes.mf` file for your printer. I hope to automate the selection of these parameters when redesigning the configuration dialog boxes.

There might still be some problems when printing:

- glyphs are drawn mirrored or upside-down; this has been solved for some printers by upgrading the driver, but the real answer is to rewrite something in `windvi`⁸;
- the printed zone is shifted; this can happen on some printers and need to be fixed.

10.2 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 6.2—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
```

⁸Windvi is using bitmaps with negative height, which are documented by Microsoft and compatible with X-Window bitmaps; sadly not all drivers support them correctly.

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 whether 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, whether 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
```


11 Converters

11.1 PDF target

You have 2 tools to do this:

1. PDF \TeX 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.

11.2 HTML target

The \TeX 4ht converter is provided. Its use is documented in the *Web Companion Book*.

11.3 Graphics converters

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 \TeX 4ht, the \TeX to HTML converter.

11.3.1 Other tools

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.

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12 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.

13 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 them⁹, 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.

⁹By example, NTFS but not FAT !

14 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.pdf](#)
- [web2c.pdf](#)
- [tds.pdf](#)
- [dvips.pdf](#)
- [windvi.pdf](#)

15 FAQ

16 HOWTO

16.1 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, simply 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.

17 Sources

18 How to build fpTeX?

Almost all the patches to the source code of teTeX have been integrated in the main distribution. 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.

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     dvcopy.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  
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       mktexfm.exe       mktexupd.exe  
mllatex.bat      mltx.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	pdfcslatex.bat	pdfcslatexd.bat	pdfcslatexi.bat
pdfcslatexk.bat	pdfcsplain.bat	pdfcsplaind.bat	pdfcsplaini.bat
pdfcsplaink.bat	pdfdde.exe	pdfefinitex.exe	pdfelatex.exe
pdfetex.dll	pdfetex.exe	pdfevirtex.exe	pdfimages.exe
pdfinfo.exe	pdfinitex.exe	pdfjadetex.exe	pdflatex.exe
pdfmex.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
viomega.exe	virtex.exe	vptovf.exe	weave.exe
windvi.exe	wpng.exe	wrjpgcom.exe	xmltex.exe
zlib.dll			

263 File(s) 11930739 bytes
2 Dir(s) 792903680 bytes free