

1 Installing T_EX and L^AT_EX

T_EX Live installs very easily on all modern desktop, laptop, and server platforms. You can get a copy of the DVD from your local T_EX user group, or you can download the installation from CTAN in <http://www.ctan.org/tex-archive/systems/>

This course is based on using one of the following distributions of T_EX from the T_EX Collection DVD:

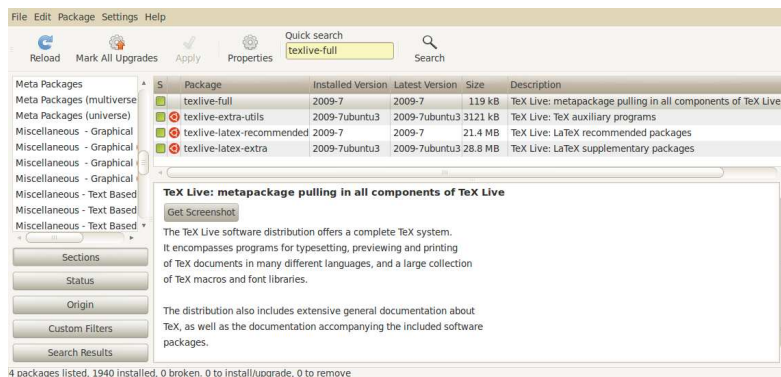
T_EX Live for GNU/Linux, Unix, Mac OS X, and Microsoft Windows (this supersedes Thomas Esser's *teT_EX* distribution which is no longer supported);

proT_EXt for Microsoft Windows (by Thomas Feuerstack) which includes Christian Schenk's *MiK_TE_X*, the *T_EXMakerX* editor, *GhostScript*, and *GSView*;

MacT_EX for Apple Macs running OS X. *MacT_EX* includes the *T_EXshop* editor.

Other implementations of T_EX can be downloaded from CTAN, but the above are the standard systems. L^AT_EX is included with all distributions of T_EX.

The T_EX Collection DVD is issued annually by TUG in conjunction with many of the local T_EX user groups around the world (see <http://www.tug.org/lugs.html> for addresses), and edited by Sebastian Rahtz, Karl Berry, Manfred Lotz, and the authors of the software mentioned above.

Figure 1.1: Installing T_EX Live from *Synaptic*, the *Ubuntu* package manager

These people give an enormous amount of their personal time and energy to building and distributing these systems, and they deserve the thanks and support of the user community for all they do.

There is also a selection of commercial distributions you can buy, as described in p.i in §: they all process L^AT_EX identically, but there are some differences in size, speed, packaging, installation, support, and extra software provided.

One final thing before we start: always check to see if there is a more recent version of the installation program online. See the list on p. 16 in § 1.4 for more details.

1.1 Installing the software

1.1.1 Unix and GNU/Linux

Users of modern GNU/Linux systems don't even need the T_EX Collection DVD, as T_EX installation packages are available online, built into the package manager for your system.

If your system has a graphical package manager (e.g. Ubuntu's *Software Center* or *Synaptic*, see Figure 1.1), run it and install `texlive-full`, `ghostscript`, `gv`, `okular`, `kile` (or `texmaker` or `emacs`), and `jabref`. Some of them may already be installed on your system. Go and have a cup of coffee while they automatically install all the necessary components.

The new *Ubuntu Software Centre* only allows one package to be installed at a time, so you may prefer to use a typed command (other Linux users may prefer this approach anyway). The command name varies from distribution to distribution; but two common ones are `yum` and `apt`:

```
sudo apt-get install texlive-full ghostscript gv okular kile texmaker emacs jabref  
or  
sudo yum install texlive-full ghostscript gv okular kile texmaker emacs jabref
```

Unfortunately, the *Okular* PDF/DVI viewer is new and incomplete: it prematurely replaced two older and much better-designed viewers, *kdvi* and *kpdf*; fortunately, at the time of writing, it is still possible to download those from different repositories and install them manually.

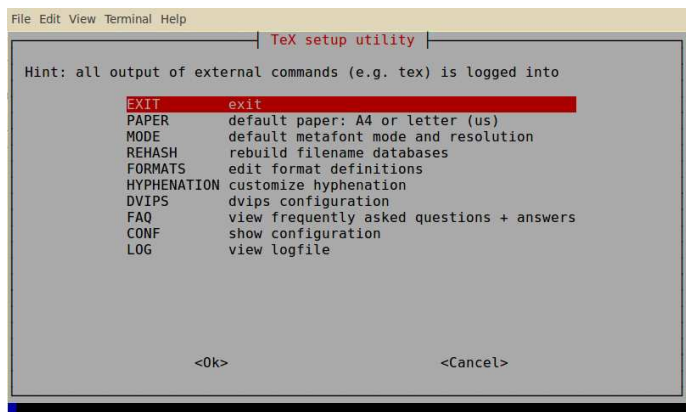
Unix and GNU/Linux installers I strongly recommend this method for all GNU/Linux users. You should only install from the T_EX Collection DVD if you are using an older, hand-built, or commercial Unix system which has no package manager. Installing from the T_EX Collection DVD for Unix requires root privileges and a good understanding of Unix systems management, and is beyond the scope of this book.

There is a minor drawback: the Linux repository versions of T_EX are usually a year out of date, because of the volunteer effort required to put them together. For new users this should not be a concern, as updates do not affect core facilities. If there are very recent packages you badly need, you can install them separately.

If you do decide to switch to the T_EX Live DVD, make sure you completely uninstall the *texlive-full* package first, otherwise your system will get hopelessly confused.

After installation, run *texconfig* (see Figure 1.2) in a terminal window to adjust your local settings. This is a console utility, so type *texconfig* to adjust your personal settings, or *sudo texconfig* to adjust them system-wide. In the utility, use the arrow keys to go up and down the options, and the TAB key to jump to (and switch between) the OK, Cancel, and other ‘buttons’ at the foot of the screen. The spacebar or the Enter key selects a menu item or button. Most settings are correct as installed, but you might want to change one of the following:

- the first option, DEST, lets you specify whether you normally want to print straight onto the printer, or ‘print’ into a file (to attach to email or upload somewhere)
- the default paper size (the PAPER option), if the installed size is not your most common one (A4 or Letter)
- the printer resolution (the MODE option), where you can adjust your printer settings; this allows you to fine-tune it for, say, a typesetter that you want to send output to instead of your own printer
- in the DVIPS option you can adjust your printer OFFSET (left and top margins), which is useful for older, less accurate printers

Figure 1.2: Running the post-installation program *texconfig*

You may also need the REHASH option later on. It is used to update T_EX's fast-find database (see step 4 in the procedure on p. 82) after adding new or updated packages.

If your printer is a conventional home or office ink-jet or laser printer, and is not shown, the LaserJet5 setting (600dpi) is probably a good bet. While still in the utility, you can test the margin settings in another window by running the *testpage.tex* document through L^AT_EX (by typing `latex testpage` and responding to the questions about paper size and double-sided printing). Print the resulting *.dvi* file with the command `dvips -f testpage | lpr` and adjust the margins in *texconfig* if necessary. These adjustments are not needed with PDF output.

1.1.2 Apple Mac OSX

Double-click the *MacTeX-yyyy-DVD.mpkg* package in the *mactex* folder of the T_EX Collection DVD (replace the *yyyy* with the year of your distribution as shown on the DVD sleeve). Install the package in the normal Mac way by dragging the package icon onto the hard disk icon.

When it's finished, open your Applications folder in the Finder and go to the T_EX subfolder and drag *T_EXshop* out onto your Dock. *T_EXshop* is the editor front-end to *MacT_EX* which you use for writing your documents.

If you are going to use Adobe *Acrobat Reader* instead of *Preview*, make sure you clear the font cache and set the resolution to the system default (112dpi) otherwise you may get very weird displays.

Figure 1.3: The TeX Collection installation program

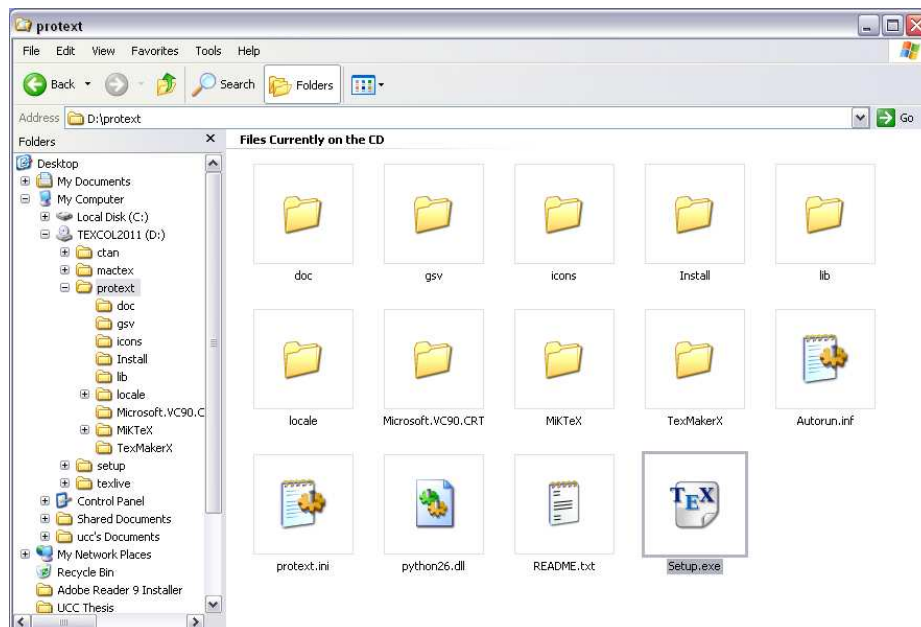


1.1.3 Microsoft Windows

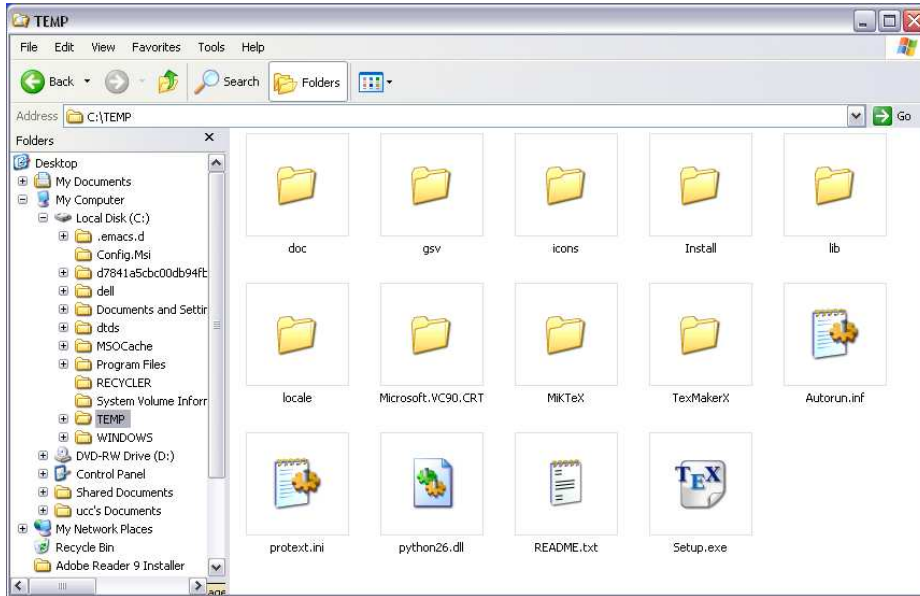
If your system has auto-run enabled, inserting the TeX Collection DVD should start the setup program automatically (see Figure 1.3). Click on the Open proTeXt button to start.

If you have auto-run turned off, insert the DVD, go to the `protext` folder, and double-click on the `Setup.exe` program as shown in Figure 1.4.

If you have downloaded the ProTeXt installation from the TeX Users Group web site, unzip it into a temporary folder and run the `Setup.exe` program from there (see Figure 1.5).

Figure 1.4: The ProT_EXt setup program on the T_EX Collection DVD

1. Make sure you have *Adobe Acrobat Reader* or a similar PDF reader installed
2. In the ProT_EXt setup window, select your language and click on the *MiKTeX* Install button (see Figure 1.6)
3. Click in the box to accept the MiKTeX licence and click Next to continue (Figure 1.7)
4. Make sure the Complete MiKTeX option is selected and click Next to continue (Figure 1.8)
5. Choose a private installation or one that everyone who uses your computer can use, and click Next to continue (Figure 1.9)
6. Accept the installation folder that MiKTeX suggests (unless you are an expert or have a special disk setup) and click Next to continue (Figure 1.10)
7. In the Options screen (Figure 1.11), select your paper size (A4 or US Letter), and whether or not you want extra packages to be downloaded and installed automatically (Yes or No) — on a laptop

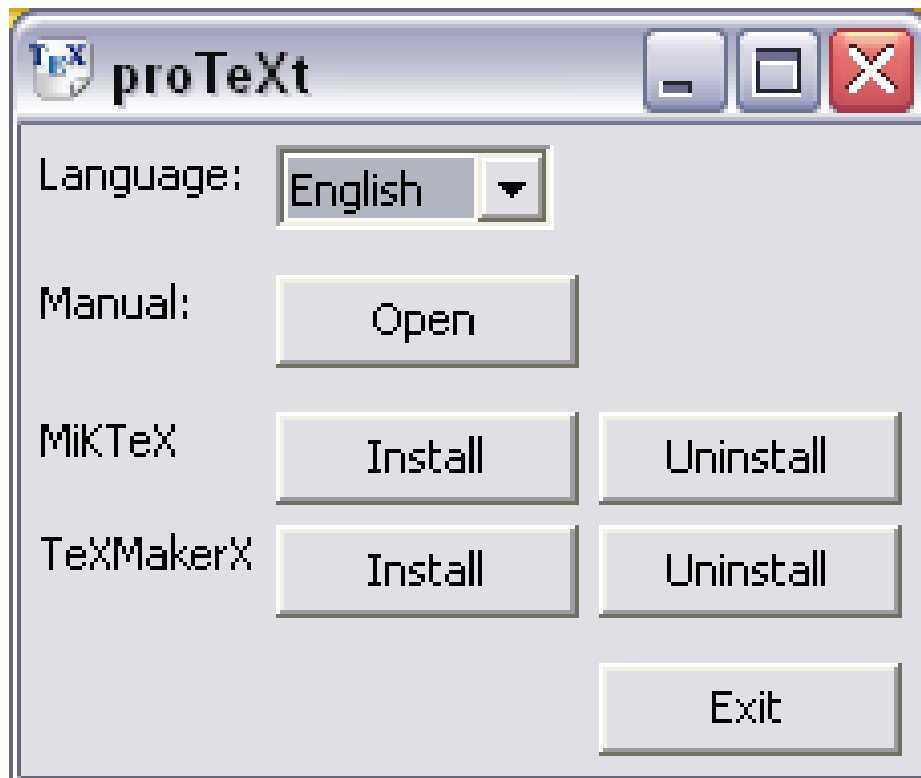
Figure 1.5: The Pro \TeX t setup program in the unzipped download folder

where a network connection is not always present, choose 'Ask first' instead, then click Next to continue

8. Finally, accept the settings as shown in Figure 1.12 (or change them by clicking Back), and then click Start to start the installation process
9. During installation, MiK \TeX will list the files it is installing and show a progress bar (Figure 1.13)
10. When it is all done, click Finish (Figure 1.14)

Two more things to do: install the \TeX maker X editor, and add a personal \TeX folder for extra downloads such as additional fonts.

1. Go back to the pro \TeX t setup window and click on the \TeX maker X Install button (see Figure 1.6). The \TeX maker X installation program will start: click Next to continue (Figure 1.15)
2. Select the language to use during installation and click OK to continue (Figure 1.16)
3. Click Next in the following screen to continue (Figure 1.17)

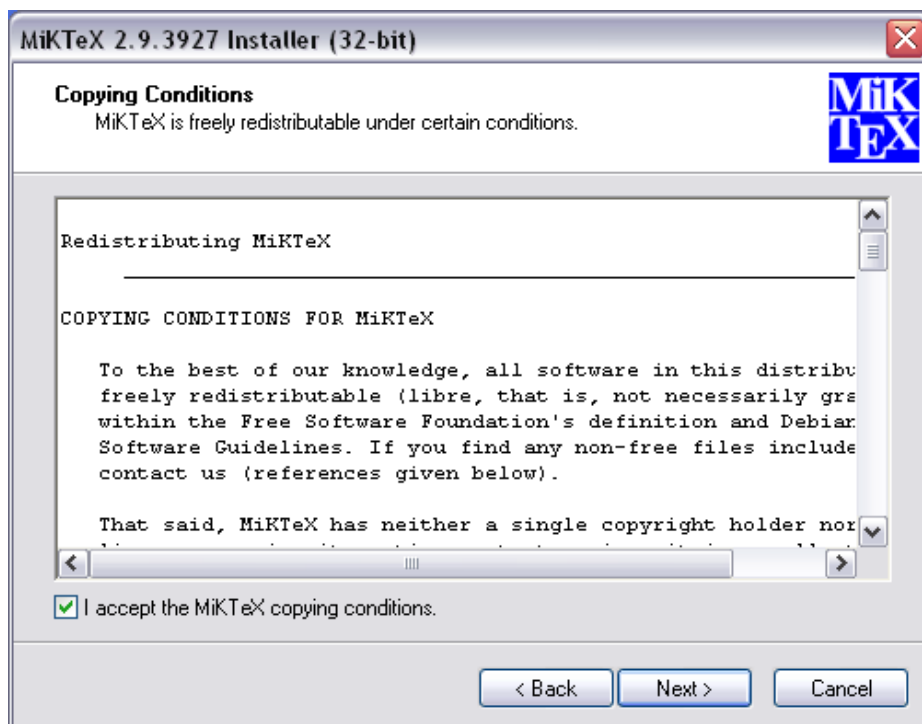
Figure 1.6: Installation of proT_EXt

4. Accept the installation folder that T_EXmakerX suggests (unless you are an expert or have a special disk setup) and click Next to continue (Figure 1.18)
5. Also accept the suggested location for the T_EXmakerX shortcut and click Next to continue (Figure 1.19)
6. Finally, accept the settings as shown in Figure 1.20 (or change them by clicking Back), and then click Install to start the installation process
7. When it is all done, click Finish (Figure 1.21)

1.2 Adding your personal T_EX directory

T_EX Live and MiK_TE_X (but not Mac_TE_X) will automatically download and install package updates and additional packages for you, by recognising

Figure 1.7: Accepting the MiKTeX licence



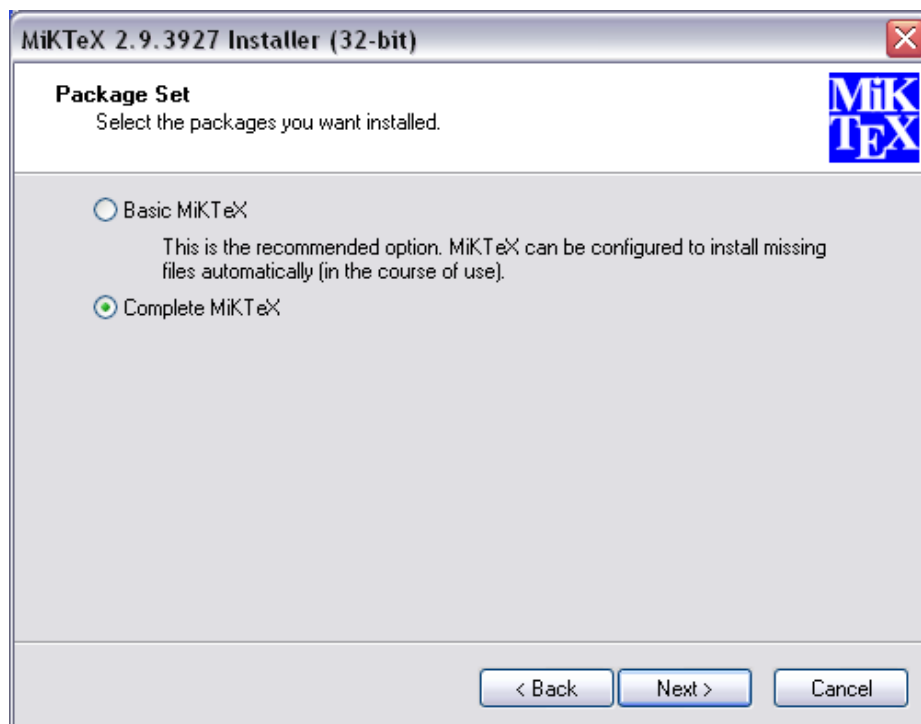
when you include a package in your document that isn't yet installed. This is rare if you pick the 'full' installation option, as you then have pretty much all the packages already installed, but there are always new packages coming out.

However, there are also times when you may want to add a new or unusual package by hand — perhaps a private package from your company or institution that L^AT_EX would not know about, or even one you are writing yourself. To do this, you need a personal package folder (known as a Personal T_EX Tree or Personal T_EX Directory). You therefore need a place to put the files, and that's what this section is about.

L^AT_EX will automatically check there first for packages, so anything you put in your personal T_EX directory will supersede any file of the same name in your main T_EX installation, which is why it's important for updates and special or private classes, packages, styles, and fonts.

The folder is called `texmf`. For Unix-based systems, including GNU/Linux and Mac OS X, that's all you have to create for now. For MiKTeX, you also

Figure 1.8: Selecting the complete installation



have to tell the system that you want the folder checking (see § 1.2.3: this is important, as otherwise MiKTeX won't use it).

1.2.1 Unix and GNU/Linux

Create `~/texmf`.

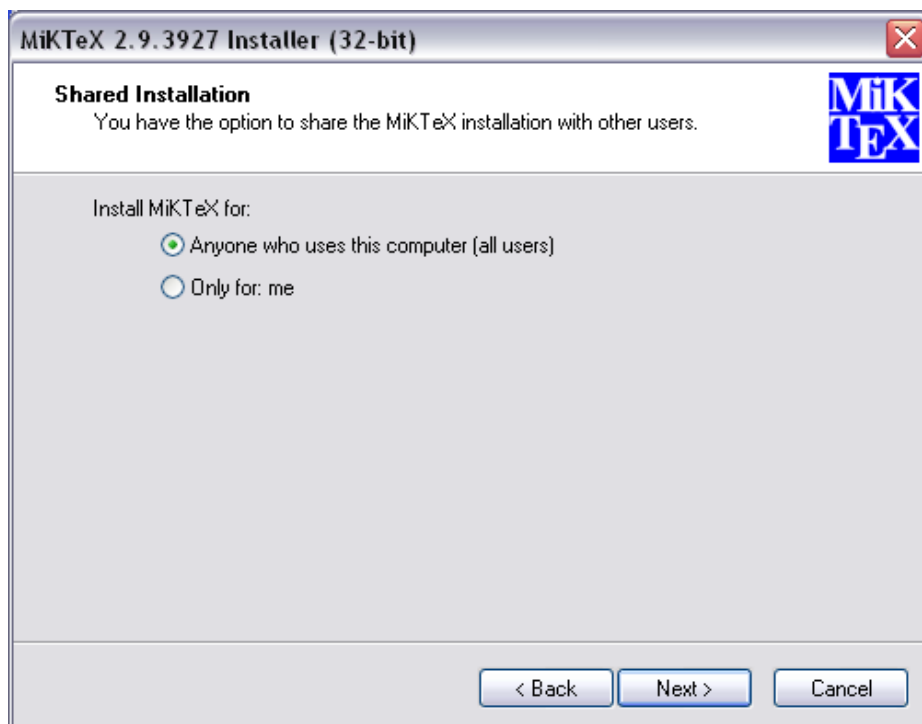
1.2.2 Apple Mac OSX

Create `~/Library/texmf`.

1.2.3 Microsoft Windows

1. Open *My Computer* (just called *Computer* in *Windows 7*), and create a new subfolder called `texmf` in the `C:` drive (XP) or `Computer\System\Users\argument{yo}` (Win7), as in Figure 1.22. Make sure it is called `texmf` (all lowercase) and nothing else.

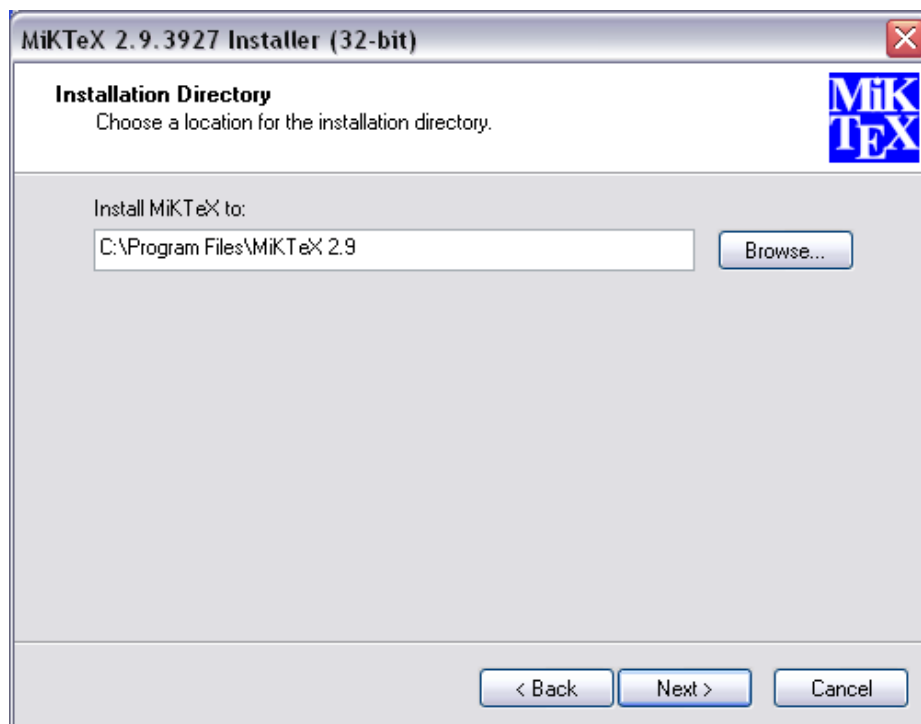
Figure 1.9: Private or shared use



2. Click the Start or Windows button and run the MiKTeX Options (maintenance) program (it should be shown among your recent programs).
3. Click the Roots tab and the Add button, and navigate in the window to the place where you created the `texmf` folder above (Figure 1.23)
4. Lastly, click on the General tab and tell MiKTeX to update it along with its other folders by clicking the Refresh FNDB button (Figure 1.24)

You *must* click on the Refresh FNDB button any time you make changes to the contents of your personal T_EX directory (the `texmf` folder), otherwise MiKTeX will not be able to find the files.

Figure 1.10: The MiKTeX installation folder



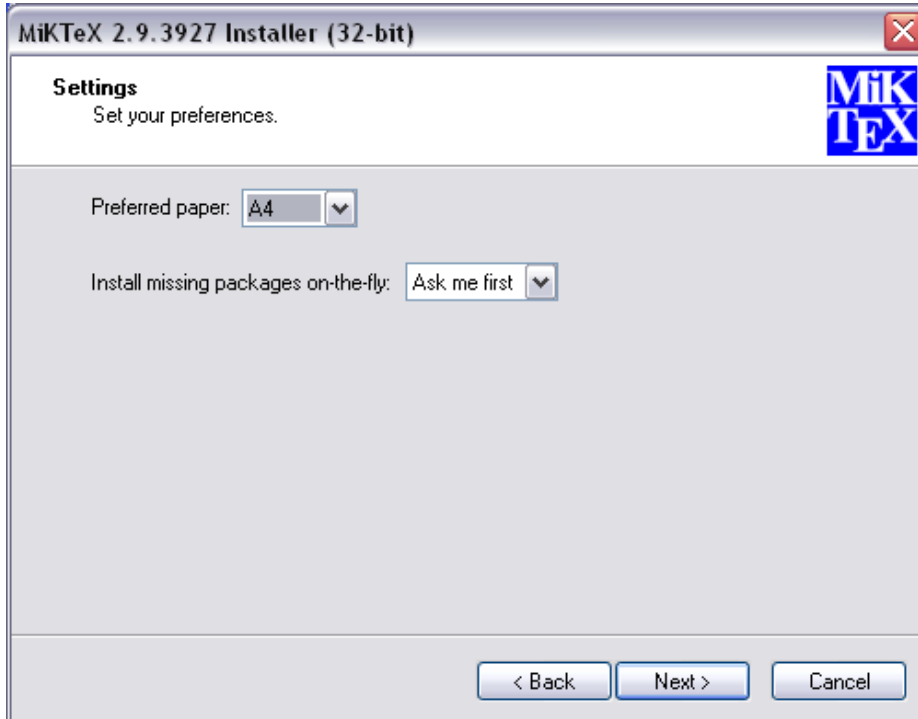
1.3 Picking an Editor

One of the best features of T_EX-based systems like L^AT_EX is that they don't force you to use any particular editor or viewer: you can pick one that you're comfortable with.

One of the worst features (for a beginner) is not understanding this: many new users have never seen flexible or adaptable software before, and may be unfamiliar with the idea that you don't have to do what you're told: you can pick and choose.

Nevertheless, I'm solving this by edict for beginners here: *unless you already have a pet editor or viewer*, just use the one shown below. In the case of *ProT_EXt* (Windows) and *MacT_EX* (Macs) the editor is the one that comes with the distribution (*T_EXMakerX* and *T_EXshop* respectively). Unix and GNU/Linux users need to choose and install an editor separately.

Figure 1.11: Paper size and package installation options



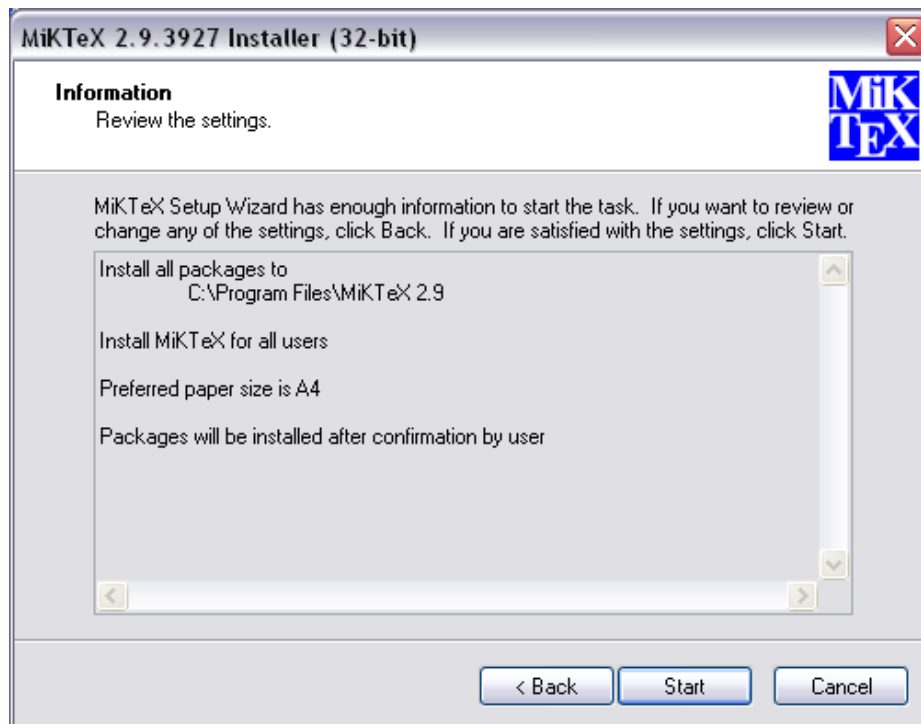
| System | Package | Engine | Editor | Viewer |
|--------------------|-----------------------|---------------------------------|---------------------------------------|----------------------|
| Microsoft Windows | ProT _E Xt | MiK _T E _X | T _E XMakerX | Adobe Acrobat Reader |
| Apple Mac OS X | MacT _E X | gwT _E X | T _E Xshop | Preview |
| Unix and GNU/Linux | T _E X Live | T _E X Live | Kile, T _E XMaker, or Emacs | Okular or kpdf/kdvi |

However, there are many other editors, if you want to try them out and pick one you are comfortable with. In particular, *Emacs* is also available for Windows (*NTEmacs*) and for Mac OS X (*Aquamacs*); *T_EXMaker* is also available for Macs; and the L_AT_EX near-WYSIWYG front-end to L_AT_EX is available for all platforms.

1.4 Installation problems

It's always annoying when a program that's supposed to install painlessly causes trouble, and none the more so when everyone else seems to have

Figure 1.12: Review your installation settings

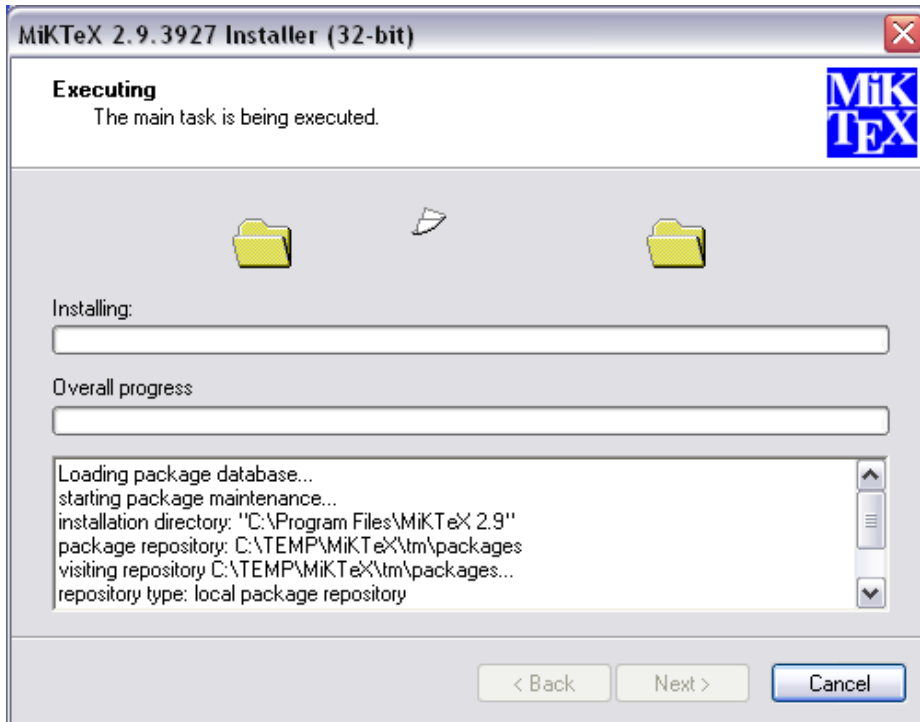


been able to install it without problems. I've installed T_EX hundreds of times and very rarely had any difficulties, but these are a few of the occasions when I did.

Bad hard disks If you are using Microsoft Windows, you should run a scan and defragmentation of your hard disk[s] before you start. It should take under an hour on a modern machine unless you have a very large disk, but it may need overnight on an older machine. Clean your DVD drive if it has been in heavy use. T_EX is made up of a very large number of very small files, so there is a lot of disk activity during an installation. Microsoft Windows runs very slowly when installing a lot of small files, so be patient.

On any system, if you are installing a new hard disk for your typesetting work, you have the chance to reformat it beforehand. Pick the smallest granularity (cluster size) possible, usually 1024 bytes (1Kb). This minimises the space needed for systems with a very large

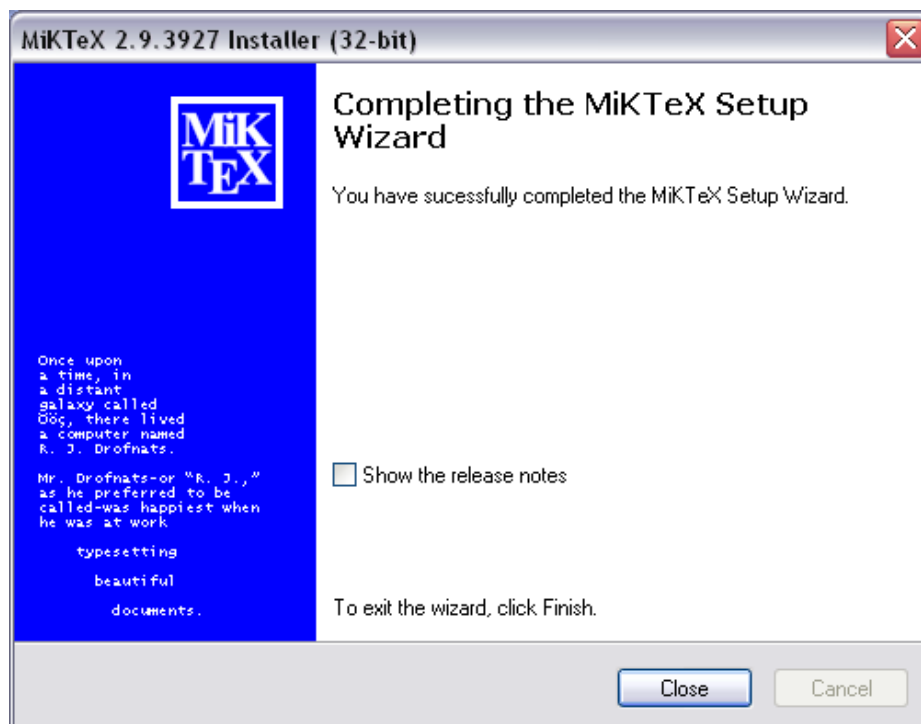
Figure 1.13: MiKTeX installing



number of very small files like $\text{T}_{\text{E}}\text{X}$ has, and may help improve the speed and reliability of the system.

Windows Registry errors This only affects Microsoft Windows users. The Registry is where Microsoft wants software companies to store details of all the programs you install. Unfortunately the Registry is grossly abused by marketing departments to try and foist undesirable links on you, the user. You will see this with many commercial programs, where a particular type of file you've been able to double-click on for years suddenly runs a different program. Some programs install obsolete or broken copies of program libraries (DLL files), overwriting ones which were working perfectly. Worse, the viruses, trojans, and worms which typically infect unprotected Windows systems can leave unwanted links to web pages, or change some of the ways in which Windows operates. The overall effect can be that the whole machine slows down, or that files which are expected to do one thing do

Figure 1.14:



another. The best solution is a thorough Registry clean-out, using one of the many free or commercial programs available for the purpose.

Use the latest versions Before installing, check the CTAN web site (subdirectories of <http://tug.ctan.org/tex-archive/systems/> named after the systems `protext`, `mactex`, etc. for an updated copy of the installation program. This is called `MacTeX-yyyy-DVD.mpkg` for Macs, and `Setup.exe` for Microsoft Windows. Just occasionally a bug slips through onto the production DVD, and although it's always fixed and notified on `comp.text.tex`, that's a high-volume newsgroup and even the sharpest eyes may miss an announcement.

Unix and GNU/Linux users will always get the latest repository copy from their system's package manager, but this may not be the absolute latest copy of T_EX (see §?? for why). If you are installing on Unix manually from the T_EX Collection DVD instead, check on CTAN for an updated version of the file `install-tl.sh`.

Figure 1.15: Starting the TeXmakerX installation



Figure 1.16: Selecting the language to use during TeXmakerX installation

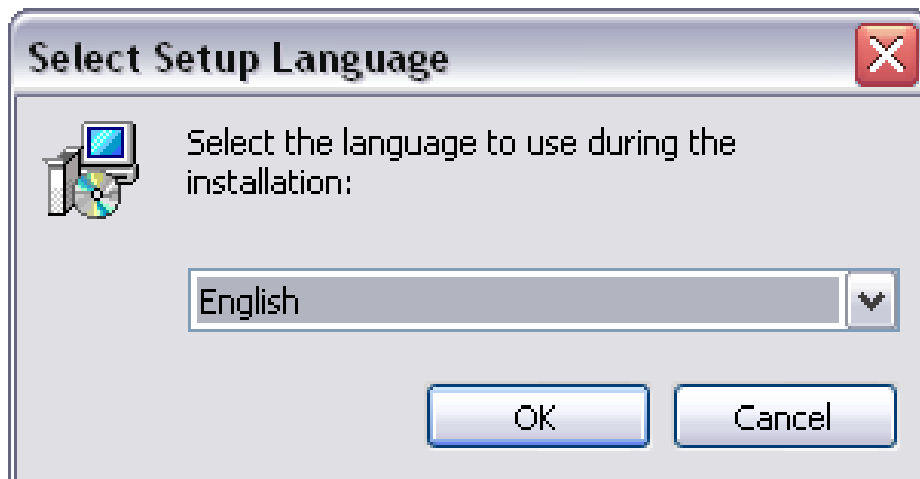
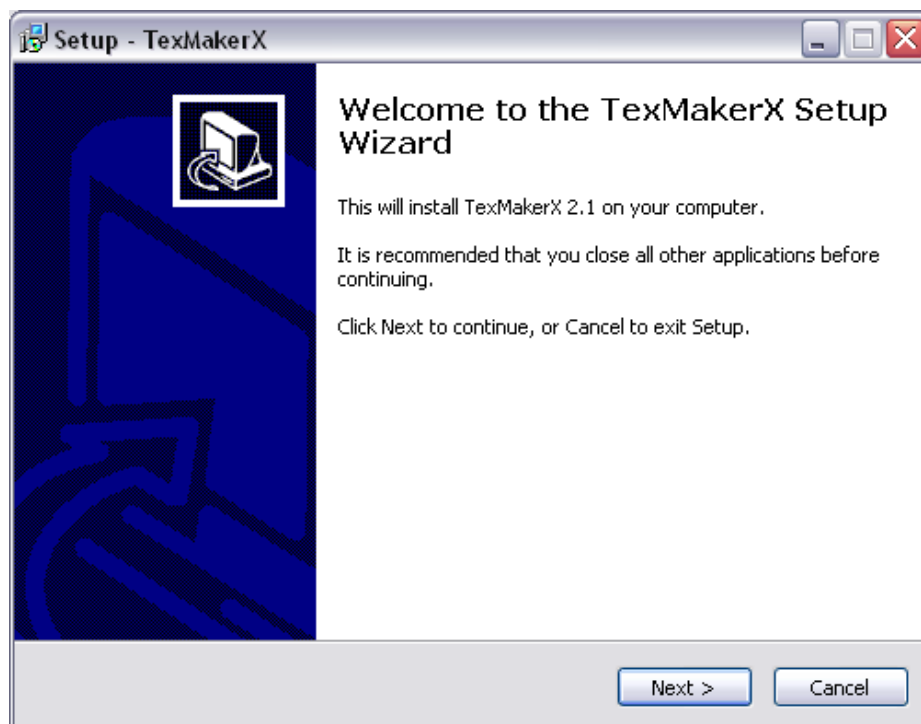
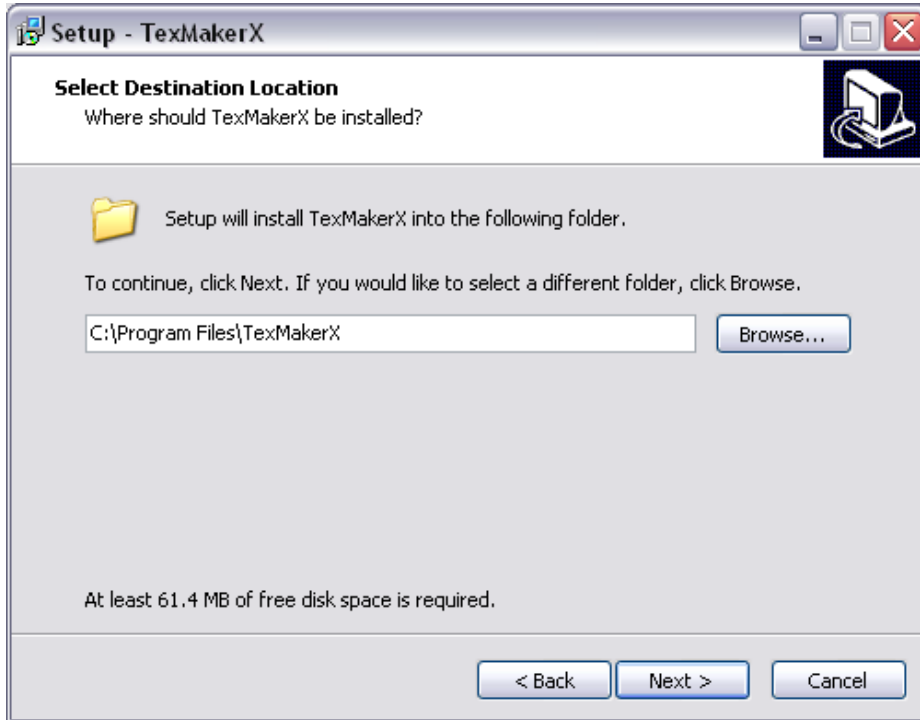


Figure 1.17: The T_EXmakerX installation introductory screen

Stick to the defaults Unless you're a computer scientist or a software engineer, I *very strongly* suggest you never change or fiddle with the default directories for installation. I know some of them look odd, but they're that way for a purpose, especially when it comes to avoiding folder names with spaces in them, like the notorious `C:\Program Files`. Although most modern systems cope happily with spaces in filenames and directory names when using a graphical user interface, they are *always* A Bad Idea, especially for programs which can be run from scripts (T_EX is one). Spaces and other non-alphanumeric characters should therefore be avoided like the plague (they are forbidden in web addresses [URIs] for the same very good reason: the people who designed them knew the pitfalls). It may look snazzier to put the installation in *My Cute \$tuff*, but please *don't*: you'll just make it harder to find, harder to fix problems, and more embarrassing if you have to explain it to someone else trying to help you.

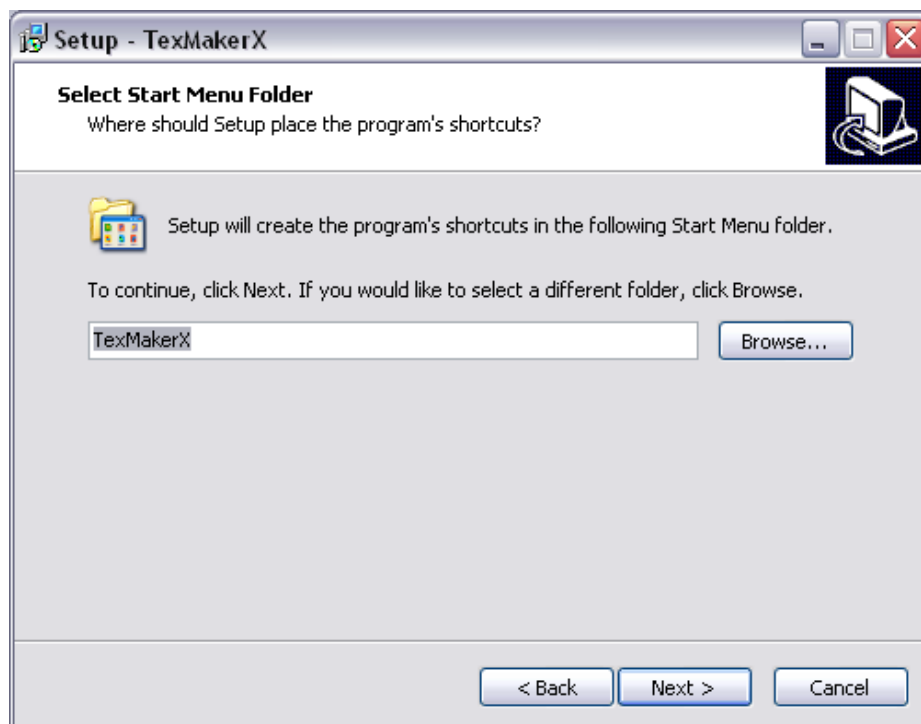
Figure 1.18: The TeXmakerX installation folder



64-bit Windows The *MiKTeX* distribution for Windows is a 32-bit program but it should install correctly on 64-bit Windows 7 systems. For safety, close down all other programs before starting the installation.

Locked systems If you want to install *proTeXt* on a computer in a lab or other group environment where the disk storage is locked down, and where the Administrator is unwilling or unavailable to install it for you, there are a couple of choices:

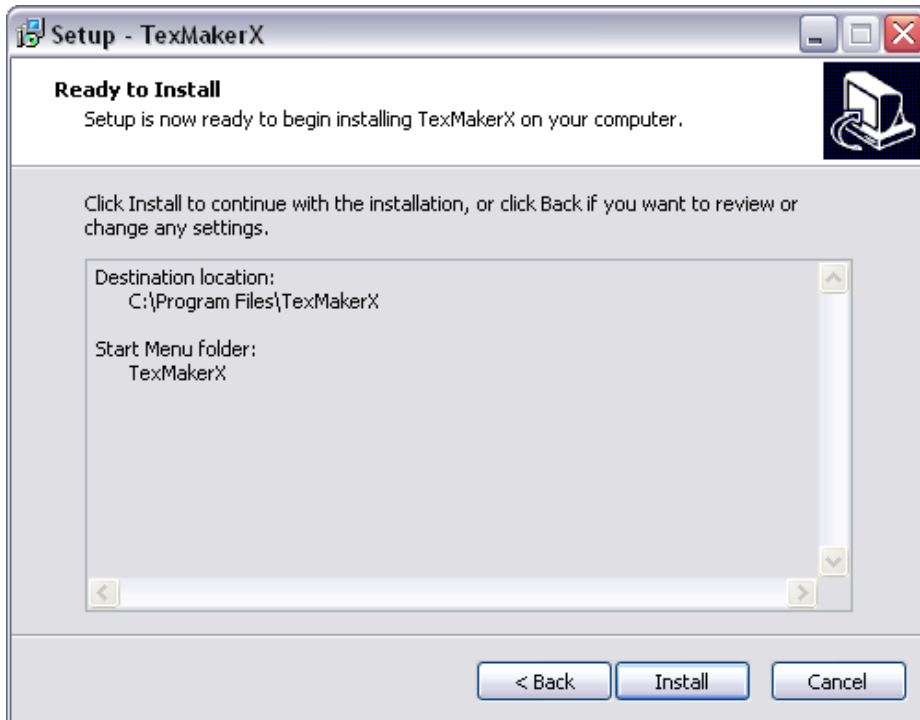
- Install it on a USB stick that you can unplug and carry with you. That way your \LaTeX installation is always with you. If you use it on another computer where the USB device mounts as a different disk letter, you will need to configure it so that it can 'see' where it is in the directory system.
- If you cannot install it at all, because the Windows Registry is also locked, and the Administrator is unwilling or unable to install it for you, you may be able to install it in a virtual container (eg

Figure 1.19: The T_EXmakerX shortcut

Windows XP as a virtual image inside Windows 7). It will be slow, and it may be missing some facilities like alternate character sets, but it will execute.

Bear in mind that shared systems in large companies, universities, and similar organisations do usually prohibit software being installed by the user (you) because of security issues over viruses, support, maintenance, and other factors. If you feel your institution needs a network installation of L^AT_EX, ask your Administrator or IT Centre to contact the T_EX Users Group or any local use group (see Appendix B), who may be able to help.

Figure 1.20:



MiKTeX and TeXnicCenter



If you plan on using the **TeXnicCenter** editor instead of **TeXMakerX**, you must make sure when you install **MiKTeX**, that you make a careful note of the folder you install **MiKTeX** into (usually something like `C:\Program Files\MiKTeX 2.9\...`) because you will need that later, when you run **TeXnicCenter** for the first time after installation. It should be something like `C:\Program Files\MiKTeX 2.9\miktex\bin` (or a later version number, if time has moved on since the time of writing). You need to know this, because **TeXnicCenter** won't guess it for you.

Figure 1.21:

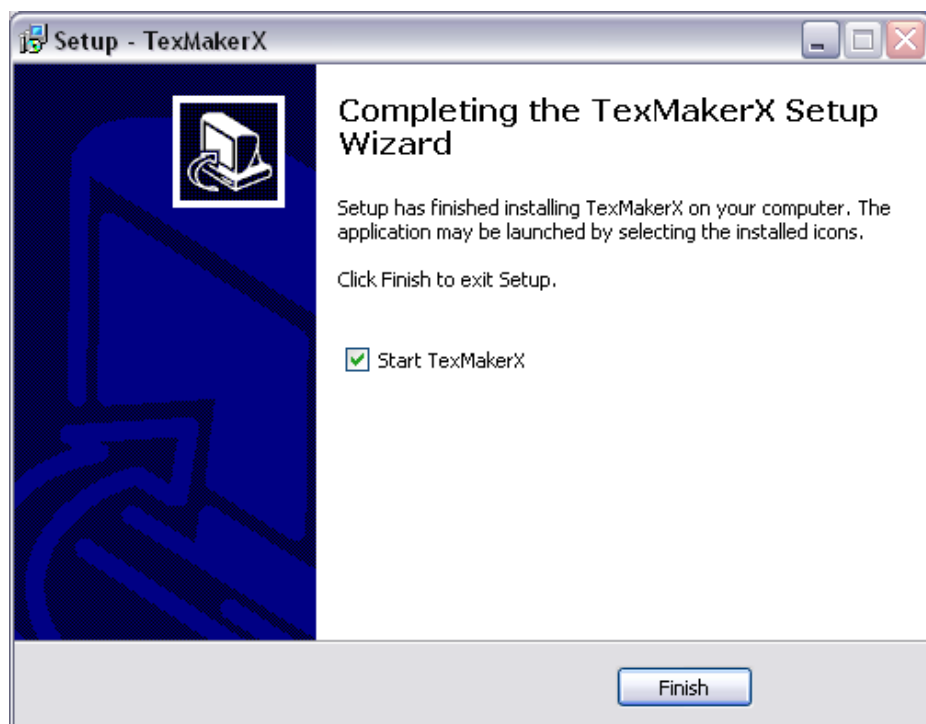


Figure 1.22: Creating a new texmf folder

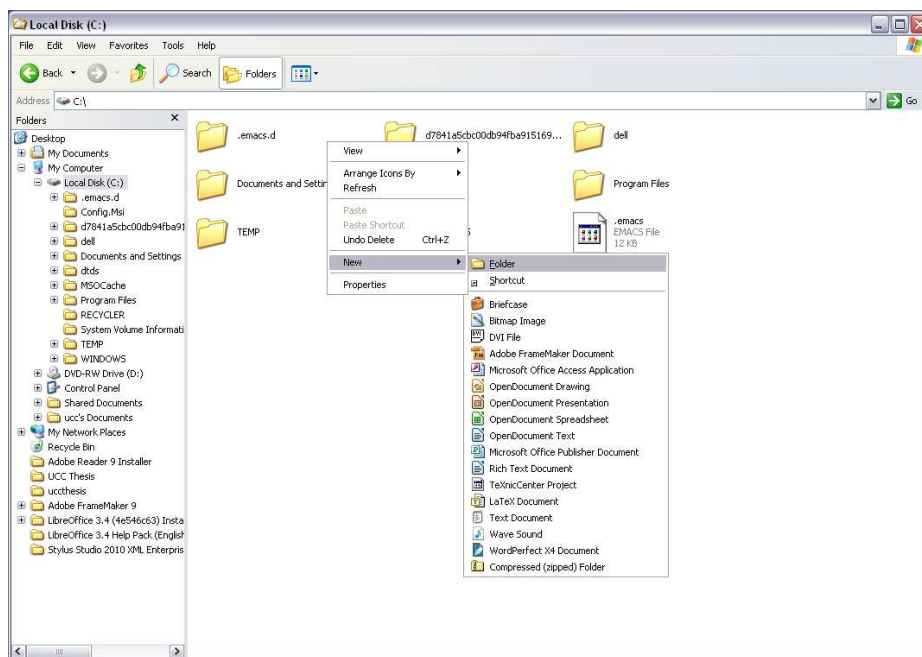


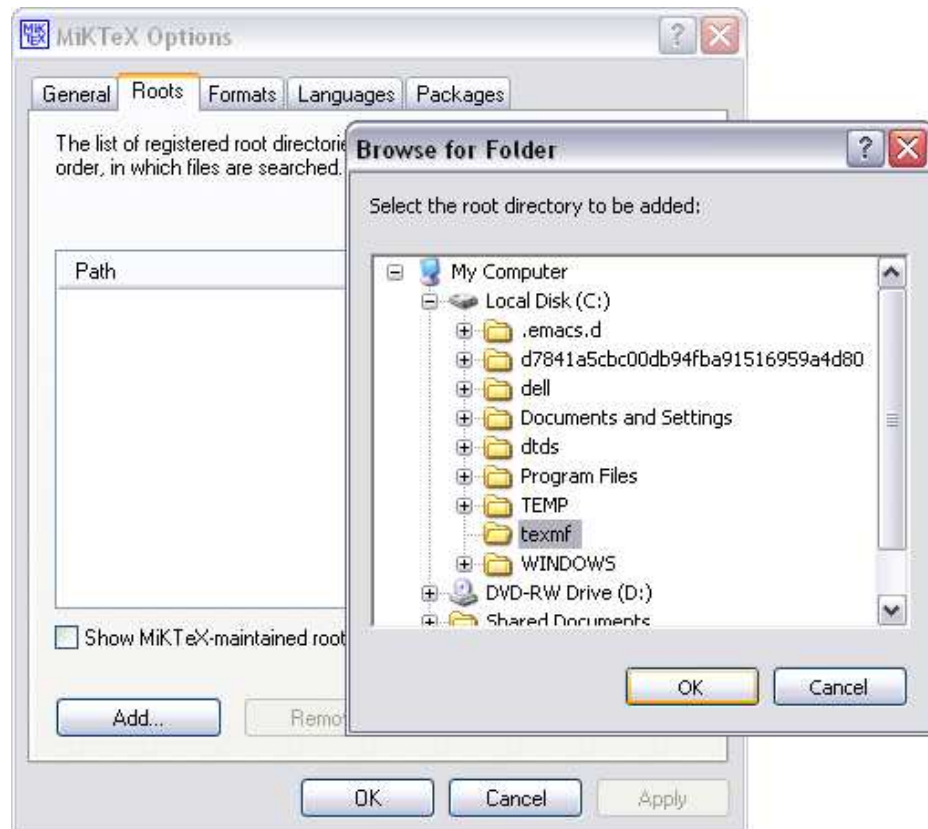
Figure 1.23: Adding your Personal T_EX Directory to MiKTeX

Figure 1.24: Updating MiKTeX's File Name DataBase (FNDB)

