

MiKTeX FGA (Frequently Given Answers)

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Abstract

This MiKTeX FGA describes how to install MiKTeX 2.2 and its related programs. This document also provides how to create EPS and PDF files, and some valuable tips.

1 Installation

This section explains how to install MiKTeX and its related programs.

1.1 Ghostscript and Ghostview

Since \TeX 's default output format is DVI (Device Independent) and PS (PostScript), you need a program that can handle PS for viewing and printing. **GhostScript** is an interpreter for the PS page description language, which is used by laser printers, and **GSView** (or GhostView) is a graphical interface for GhostScript. GhostScript can do the following powerful jobs (not conclusive):

- View and print PS and PDF files,
- Convert PS to PDF files,
- Convert PS and PRN to various raster type graphics (BMP, EPS, JPEG, PBM, PCX, PNG, and TIF),
- Convert PS to vector formats including AI (Adobe Illustrator), EMF, WMF, and FIG.
- Extract texts from PS file.

What you should do for installation is:

1. You can download **Ghostscript 8.11** and **GSView 4.5** (as of 11/23/2003) from <http://www.cs.wisc.edu/ghost/>. During the installation, specify `c:\aladdin` (or whatever you want) as the home directory for these two programs.
2. You *should* enter the path of Ghostscript binary and library directories (e.g., `c:\aladdin\gs\gs8.11\bin`; `c:\aladdin\gs\gs8.11\lib`). This can go in `autoexec.bat` under Windows9x and in **System-Advanced-Environment Variables** (or equivalent) under Windows NT/2k/XP. Restart your computer if you are a Windows 9x user.

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3. In GSView, make sure that **Options-EPS Clips** is selected. If you do not select this option, you may see some white space (i.e., big bounding box) around your EPS file that is generated by **Print to File** option (see Section 2.3).

1.2 MiKTeX Installation

MiKTeX (pronounced miktek) is one of the famous Windows implementations of \TeX and is totally free, and the current version is 2.3 as of Nov., 2003. The installation procedure is given below:

1. Download the setup file from the MiKTeX (<http://www.miktex.org>) home page, and run it.
2. You are asked if you download files or directly install them. Download files is recommended.
3. After downloading all, run the setup file again and select “Full installation” if you have enough disk space (recommended).
4. If you are in the US, set the default paper size to ‘letter’ for dvips, dvipdfm, and pdflatex.

- Open **config.ps** in `\texmf\dvips\config` directory and modify it like this:

```
@ letter 8.5in 11in
@+ %%BeginPaperSize: Letter
@+ letter
@+ %%EndPaperSize

@ A4size 210mm 297mm
@+ %%BeginPaperSize: A4
@+ a4
@+ %%EndPaperSize
```

- Open **config** in `\texmf\dvipdfm\config` directory and modify it like this.

```
% Set default paper size here
%p a4
p letter
```

- Open **pdftex.cfg** in `\texmf\pdftex\config` directory.

```
%page_width 210 true mm
%page_height 297 true mm
page_width 8.5 true in
page_height 11.0 true in
```

5. Run `initexmf --mkmaps` in DOS prompt.
6. YAP, MiKTeX's DVI viewer, needs some option changes under **View-Options-Display**. Choose **HP LaserJet 4 (600dpi)** printer and **Letter** paper size (or A4).
7. One important feature of YAP is *inverse search*. When you click any point of the DVI file, YAP will call your \TeX editor and shows the source code that you clicked on DVI. For setup this function, please refer to Section 1.3 after installing WinEdt.
8. After you make any changes in \TeX , you should update your \TeX file name database. Click **MiKTeX Options** or just type `mo` in DOS command, and press the **Refresh Now** button.

1.3 WinEdt 5.3

WinEdt¹ (<http://www.winedt.com>) is a powerful, extremely flexible, and versatile native editor and shell for MS Windows with a strong predisposition towards the creation of \LaTeX documents and much more!

Download the file and install it! The current official version is 5.3. Some advanced options and tips are:

- **Inverse search:** Open DVI Viewer (=YAP) and go to **View-Options-Inverse Search**. Select the program as WinEdt. If you can not seed WinEdt, then copy the following line into the **Command Line**.

```
Editor=C:\Program Files\WinEdt\WinEdt.exe -F "[Open(|%f|);SelPar(%1,7)]"
```

- **Error debugging:** When you encounter an error message during \LaTeX compile, typing 'e' at the DOS prompt leads to the point where the error occurs in your source \LaTeX file. Open `miktex.ini` that is in `\texmf\miktex\config`, and find the line starting with

```
;; Editor=notepad ....
;; Editor=winedt ...
;; Editor=emacs ...
```

Add the following line (it should be a single line).

```
Editor=C:\Program Files\WinEdt\WinEdt.exe -F "[Open(|%f|);SelPar(%1,7)]"
```

1.4 Additional Programs

1.4.1 GNU Emacs for Windows

Instead of using WinEdt, you can use GNU Emacs for Windows 9x/NT/2k/XP (freeware). To use \LaTeX specific commands, you need to install AUC- \TeX over GNU Emacs. Further, to use international languages under foreign Windows, you need to install Mule that uses the fonts in the Microsoft Input Method Editors (IME).

Go to the HPack Project² (http://physics.kyunghee.ac.kr/~reds/Hpack_Project/k-download.htm) and download an *integrated* version of GNU Emacs, AUC- \TeX , and Mule.

1.4.2 Math'n Table

Do you want to copy \LaTeX equations and tables to Power Point? Three methods can be possible.

- GSView: Zoom in the PS file that has your equations or tables. Click **Edit-Copy**, click **Edit-Paste to**, and save it as a BMP file. Open this file using Microsoft Paint or other graphic programs, and cut out (i.e., crop) the unwanted white space. This will reduce the file size greatly. Insert this BMP file to Power Point.
- TexPoint v1.5.4 (<http://raw.cs.berkeley.edu/texpoint/index.htm>): This \LaTeX add-in for Power Point only works with Power Point 2000 and later.

¹Remember that the name is NOT WinEdit.

²Even though this page is mixed with Hangul and English, you can easily find the program.

- Math'n Table (http://physics.kyunghee.ac.kr/~reds/Hpack_Project/k-download.htm): Looks like an automated procedure for the first method. For better result in PPT, click the right mouse button of the inserted figure and select **Format AutoShape-Picture**. Set **Brightness** with 40% and **Contrast** with 80%.

2 EPS Figures

2.1 What and Why EPS

Encapsulated PostScript (EPS) is a *standard* format for importing and exporting PostScript language files in all environments. It is usually a single page PostScript language program that describes an illustration. The purpose of the EPS file is to be included as an illustration in other PostScript language page descriptions. The EPS file can contain any combination of text, graphics, and images. An EPS file is the same as any other PostScript language page description, with some restrictions [from <http://www.eng.cam.ac.uk/help/tpl/graphics/postscript.html>].

You can use any types of graphic files such as EPS, BMP, GIF, JPEG, or PDF in your \LaTeX . \LaTeX does not care what types of figures you are using; however, your DVI to PS conversion program, DVI driver, such as `dvips`, `windvi`, or `dviout` cares! Your DVI file does not contain actual font and figure information. Instead, it just contains white boxes which represent sizes and locations of each character and figure. Think about a book publishing process. Then the DVI driver fills all the white boxes with actual fonts and figures. If the driver supports, for example, JPEG, then you can directly use JPEG file in your \LaTeX source code. However, this picture format is not standard in PostScript, and hence your source file may not be compiled in other computer boxes (UNIX, LINUX, OS/2, PC, ...) that have different \LaTeX implementations.

2.2 Programs with EPS-Export

If your drawing or plotting program supports *EPS Export* function, using this function is the best way to get EPS files. Some comments on the programs are:

- Drawing programs that support EPS export: Adobe Illustrator, Corel Draw, MS Visio, and more.
 - Adobe Illustrator is the *de facto* since PS, EPS, and PDF are Adobe standards.
 - MS Visio has bad reputation for EPS export. EPS files from MS Visio are not properly included in the PS file.
- Plotting program that support EPS export: GNU Plot, Mathematica, MatLab, Maple, Sigma Plot, and more.
 - Sigma Plot 2000 (that I use for data plotting) does not support EPS export even though you can find this option in the menu. The result is just bitmap.

Remember that the above programs may have different EPS export engines, and thus the EPS files may be different in their file sizes and compatibility.

2.3 Programs w/o EPS-Export

The best example is that you want to convert PPT (MS PowerPoint) drawing to EPS. As MS does not support EPS, the only option that you can use is the **Print to File** option of your printer. Actually you need a *PostScript printer driver* so you don't need a physical PostScript printer.

The output file from **Print to File** is **PRN** that is equivalent to PS. Then this PRN can be converted to EPS using Ghostscript.

The steps to create EPS from non MS PowerPoint (or whatever you use) are:

1. Install a PS printer driver if your current printer does not support PS. You can use one of the printer drivers in your system (or Windows CD-ROM), or can download one from HP or Apple. For WindowsXP users you can use the following printer drivers in your WindowsXP: Tektronix Phaser 850DP or Linotronic 930.
2. For flawless conversion select the following three options (See Figure 1).
 - TrueType Font: Download as softfont \Rightarrow This is an option for TrueType font embedding.
 - PostScript Output option: EPS \Rightarrow If you do not select this, your PRN cannot be converted to EPS.
 - TrueType Font Download Option : Native TrueType
3. Your PPT should be in portrait mode.
4. After drawing click **Print**. In the Print popup window, select **Current Page**, and make sure to **uncheck gray color**.
5. The figure size of the PRN file is exactly same to your default paper size. This means that your file has lots of white space (i.e, large bounding box). Open the PRN file using GSView. Go to **File-PS to EPS**, uncheck **automatic calculation of bounding box**, and click the **Yes** button. Now you can make bounding box using your mouse from left, bottom, right, to top. Save this file as *.EPS (Do not forget to put the extension).
6. Due to the bounding box adjust, you need the `clip` option in your \LaTeX source code. For example, `\includegraphics[clip=true,scale=0.8]{foo.eps}`.

3 PDF from \LaTeX

There are three methods: `ps2pdf`, `dvipdfm`, and `pdflatex`. Hyperref packages supports PDF information, bookmarks, WWW links, internal links, and more. For more information for obtaining high quality PDF from \LaTeX , please refer to “ \LaTeX 2PDF.pdf” file from <http://www.geocities.com/kijoo2000/> (strongly recommended if you are a beginner).

3.1 `ps2pdf` or Adobe Distiller

Just type this command or click the “ps \rightarrow pdf” button in WinEdt. This is the easiest and reliable method. You can convert any PS, EPS, or PRN file (even without the source codes) to PDF. But this method does not support hyper reference nor bookmarks [FixMe].

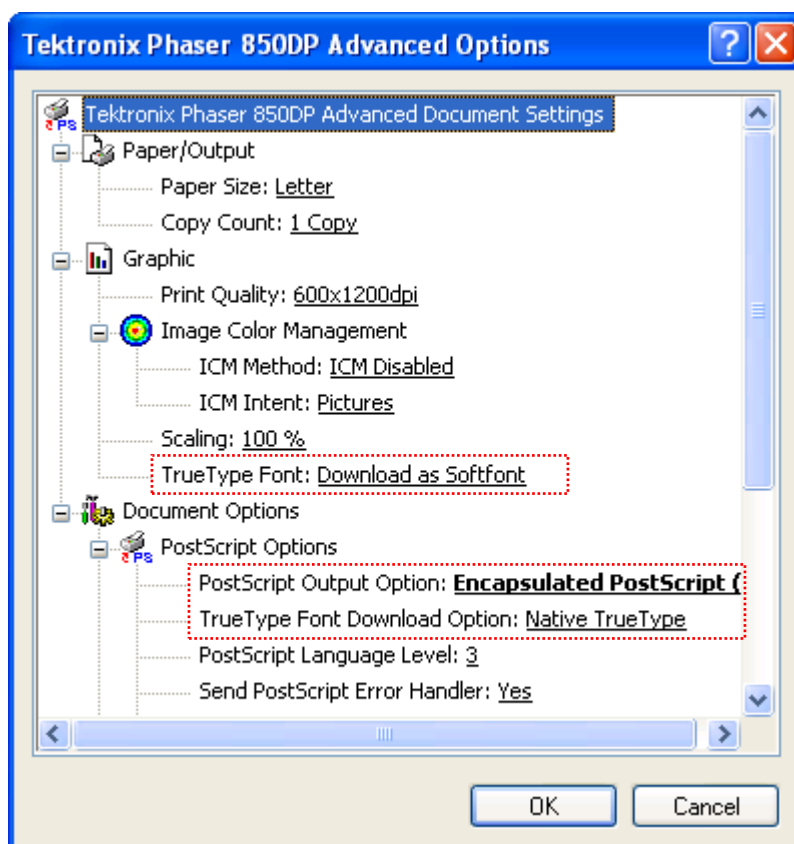


Figure 1: Printer options for print to file.

3.2 dvipdfm

dvipdfm can convert the DVI file to PDF file (again, even without the source file), and this conversion can be the *easiest and best* method when you have EPS figures³.

One example with hyperref package is given below.

```
\documentclass{article}
\usepackage[dvips]{graphicx,color}
\usepackage[dvipdfm]{hyperref}
\hypersetup{%
  pdftitle={},
  pdfauthor={},
  pdfsubject={},
  pdfkeywords={},
  pdfpagemode={UseOutlines},
  bookmarksopen,
  pdfstartview={FitH},
  colorlinks,linkcolor={blue},citecolor={blue},
```

³dvipdfm automatically converts EPS figures to PDF figures using Ghostscript.

```

    urlcolor={red},
}%
\begin{document}

```

For URL and mailto links, use `\url{http://...}` and `\url{mailto:e-mail address}`. For page reference, use `\pageref{key}` at the link page and `\label{key}` at the target page. Similarly for internal links, use `\hyperlink{key}{text1}` at the link and `\hypertarget{key}{text2}` at the target.

3.3 `pdflatex`

This is a variant (not a package) of \LaTeX and aims direct PDF generation from its \LaTeX source (thus, there is no DVI file generation). In the preamble of your \LaTeX source file, add

```

\documentclass[pdftex]{article}
\usepackage[dvips]{graphicx,color}
\usepackage[pdftex]{hyperref}

```

in the preamble. To compile the \LaTeX source code, type `pdflatex foo.tex`.

The minor problem is that `pdf \LaTeX` does not support EPS figures, and thus you have to convert all EPS files to PDF figure files with proper bounding box information. The quick solution is to use `epstopdf` program.

3.4 PDF Presentation

If you have lots of equations and \LaTeX related figures, it is better to use PDF as your presentation tool. You can also add PPT-like presentation skills such as animation, transition, backgrounds, and etc.

Use Prosper package which is developed for \LaTeX . You can get PS for transparencies or PDF for beam projection. **Ctrl+L** in Acrobat Reader is a toggle key for full screen.

It is really easy to use. Just read the manual in the package and see the example files. The author's web site has a simple prosper example file, too. You can change font size and color at the background style file if you don't like the default. If you have time, you can create your own background style file.

4 PDF from Non- \LaTeX Sources

This section is not directly related to \LaTeX , but the tool is already explained.

Do you want to convert your multi-paged MS Word, PPT, Excel or other document files to PDF for free of charge? Your PostScript printer driver that you installed in Section 2.3 can do. You have to change **PostScript Output option** (see Figure 1) to **Optimize for portability**, instead of **EPS**.

If your file is `foo.prn`, then typing `ps2pdf foo.prn foo.pdf` will convert it PDF. Instead, you can also use **Adobe distiller**.

5 MetaPost for Creative Drawings

5.1 Intro

For complicated *scientific and artistic* drawings, you may use MS Visio or AutoCAD. As explained earlier, Visio has a bad EPS export engine. AutoCAD is for professional designers such as civil engineers and thus is very expensive and heavy to use. You can use MetaPost and Pstricks package. Since I have no experience with Pstricks, I describe only MetaPost.

MetaPost is closely related to METAFONT. Dr. Knuth also developed METAFONT for professional postscript font designs. Dr. Hobby who was his Ph.D. student, developed MetaPost for scientific drawings and plots based on METAFONT. MetaPost is already in your system. Go to `c:\texmf\doc\metapost\base` and read `mpman.pdf` if you want to use MetaPost. It is art!

5.2 How to Use

Copy the following code and name it as `test.mp`. To use \TeX commands, you can add the codes between `verbatimtex` and `etex;`, and you can load as many packages between them as you want.

```
verbatimtex
%&latex
\documentclass[12pt]{article}
\usepackage{txfonts}
\begin{document}
etex;
beginfig(1);
a=.7in; b=.5in; z0=(0,0); z1=-z3=(a,0); z2=-z4=(0,b);
draw z1..z2..z3..z4..cycle;
draw z1--z0--z2;
label.top(btex $a$ etex, 0.5[z0,z1]);
label.lft(btex $b$ etex, 0.5[z0,z2]);
makelabel.bot(btex $(0,0)$ etex, z0);
endfig;
end
```

Type `mpost test` or `mp test` that will create `test.1` file. This file is a PS file with a proper bounding box and can be inserted in your \TeX file using `\includegraphics{test.1}` command in the figure environment. By changing the extension of this file to “`test_1.mps`”, this file can be directly inserted to `pdflatex`. No need to convert to pdf figures. Do not try to see the DVI file since YAP, MiKTeX DVI viewer, cannot render the figure. Check the final PS file.

If you encounter “... unable to write *.mpx file” error message⁴, you need manual procedure or a small batch file. Follow the procedure that the MetaPost manual suggests.

You can see the MetaPost-generated PS file in your final PS file using GSView. However, when you open the MetaPost-generated PS file using GSView, you can only see the PS figure above the positive x and y coordinates. For instance, in the above example, you can only see the first quarter of the figure. Further, if you have any text

⁴This error may occur when you use `verbatimtex...etex;`. But this is a computer-dependent problem.

in your MetaPost generated figure, you cannot see anything in GSView. This is due to different definitions of font names between MetaPost and GSView. Of course, you can match both font names and see it in GSView. You want to know how? And how to convert MetaPost generated PS figure to EPS format? [The answer is already given.]

5.3 More Examples

Go to <http://www.math.jussieu.fr/~zoonek/LaTeX/Metapost/metapost.html> and see more than 300 MetaPost examples. Figure 2 shows some examples taken from this web site. For figures that have repeating units, the code to draw these figures are very simple. For example, the third figure (*Koch fractal!*) in the first column in this figure is generated from the following code.

```
beginfig(201)
u:=2cm;
vardef koch(expr A,B,n) = save C; pair C;
  C = A rotatedaround(1/3[A,B], 120);
  if n>0:
    koch( A,      1/3[A,B], n-1);
    koch( 1/3[A,B], C,      n-1);
    koch( C,      2/3[A,B], n-1);
    koch( 2/3[A,B], B,      n-1);
  else:
    draw A--1/3[A,B]--C--2/3[A,B]--B;
  fi;
enddef;
z0=(u,0);
z1=z0 rotated 120;
z2=z1 rotated 120;
koch( z0, z1, 4 );
koch( z1, z2, 4 );
koch( z2, z0, 4 );
endfig;
```

Of course, you can make *animated* MetaPost figures!

6 Useful Tips

6.1 Font Selection

- `\usepackage{mathptmx}` gives Times text and math fonts.
- `\usepackage{mathpazo}` gives Palatino text and math fonts. These `mathptmx` and `mathpazo` fonts are already in your \TeX system (parts of PSNFSS collection) and are substitution of the obsolete `times` and `palatino` fonts.
- `\usepackage{txfonts}` gives Times text and math fonts.

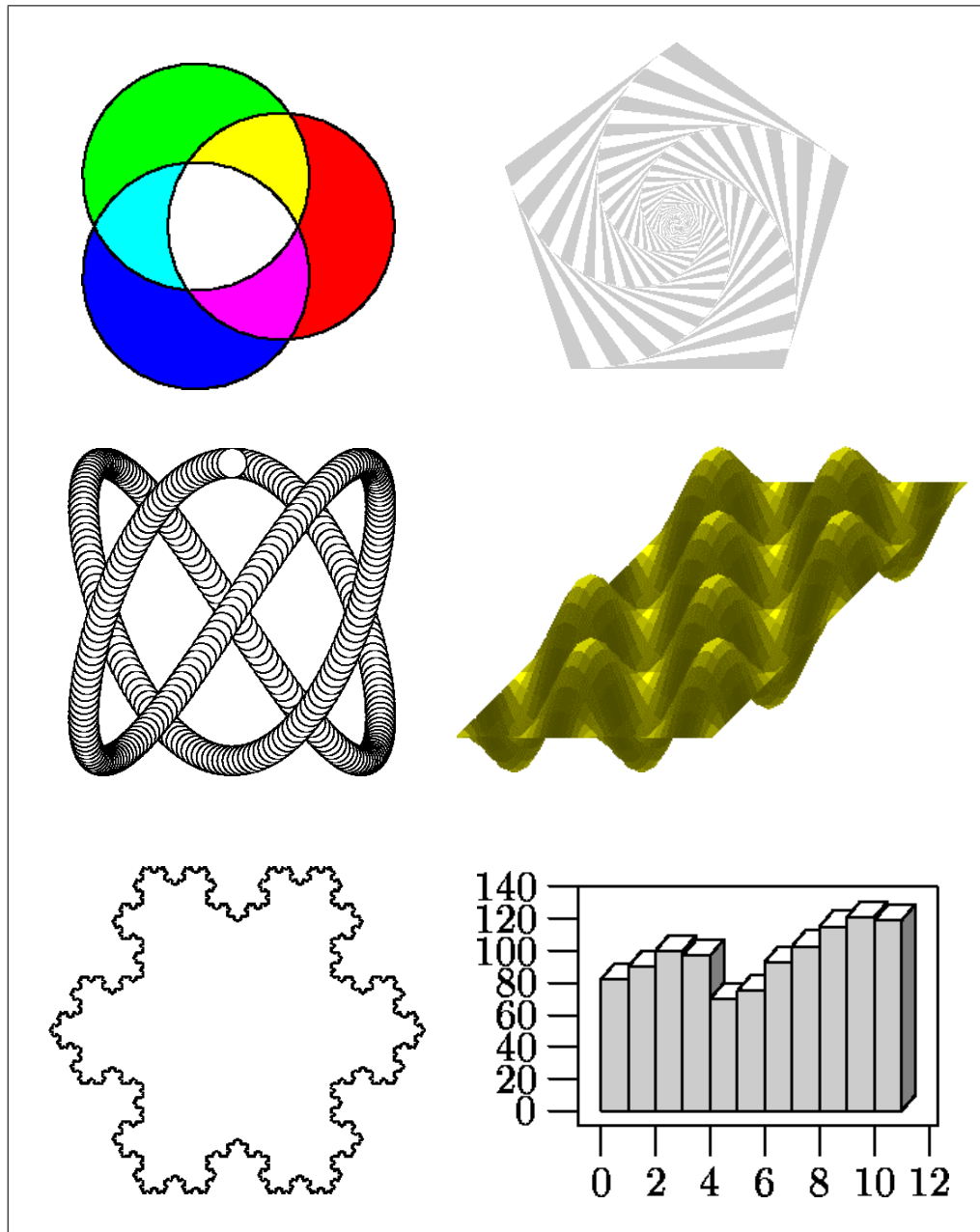


Figure 2: MetaPost examples.

- `\usepackage{pxfonts}` gives Palatino text and math fonts. These `txfonts` and `pxfonts` will be installed when you choose full installation of MikTeX 2.2 (At version 2.1 there is a configuration problem). These two fonts are more complete than the `mathptmx` and `mathpazo` fonts.
- How to temporarily change font in the middle of texts? See the following example:

```
This is txfonts, {\fontfamily{phv}\selectfont but this is Helvetica!}
```

generates “This is txfonts, but this is Helvetica!”

- Now how can I find the `fontfamily` name? Please see the `psnfss2e.pdf` file in your `\texmf\doc\latex\psnfss` directory.

For more information about font selection, please refer to “MiKTeX_Fonts.pdf” in the author’s web site.

6.2 DVIPS Options

If `imsi.dvi` is your DVI file,

<code>dvips imsi</code>	Converts to <code>imsi.ps</code> file
<code>dvips -P pdf imsi</code>	Converts to <code>imsi.ps</code> which is optimized for PDF conversion
<code>dvips -G0 imsi</code>	Under MikTeX 2.0, ‘f’ is changed to £ when you use times or palatino font. This option will keep the original font encoding. The default setting of WinEdt is <code>dvips -P pdf -G0</code> .
<code>dvips -j0 imsi</code>	If you use <code>txfonts</code> or <code>pxfonts</code> , some HP printers cannot print anything. In this case, use this option.

Of course, you can combine all the options. For more information, see `c:\texmf\doc\dvips\dvips.dvi`.

6.3 Others

- Manuals? : First check the `c:\texmf\doc` directory.
- Where do I put my new style files? : You can put your new style files in `c:\localtexmf\your_directory` or `c:\texmf\tex\latex\misc`. Do not forget to refresh the \TeX file name database.
- CTAN Search: When you search package files, do not put file extension in the search box.
- `*.ins` and `*.dtx` files? : If your search result files are `foo.ins` and `foo.dtx` files, not `foo.sty` file, download both files. Type `latex foo.ins` (two or more times) to get `foo.sty` file, and type `latex foo.dtx` (two or more times) to get `foo.dvi` guide file.
- How to merge two or more PS files? : With ghostscript you can do the following : `gswin32 -dPATCH -dNOPAUSE -sDEVICE=pswrite -sOutputFile=merged.ps coverletter.ps doc.ps`. If you have Acrobat Distiller, Distiller can also perform this job more easily.
- How to merge two or more PDF files? See `LaTeX2PDF.pdf` from <http://www.geocities.com/kijoo2000/>.

7 \LaTeX Links and Help

7.1 Where to Find Further Information

- CTAN—Comprehensive \TeX Archive Network (<http://www.ctan.org>): CTAN means everything to \TeX users.
- `news:comp.text.tex` user group. You can find any types of answers that you want to know. Where is it? It is your assignment to find it.
- (La) \TeX navigator (<http://www.loria.fr/services/tex/english/index.html>): Very good navigator site. Tells you what to read and what you need.

7.2 Recommendations

- *The Not So Short Introduction to \LaTeX 2 ϵ* – A complete beginners' guide. Can get it from \LaTeX navigator. Even though this is a good introductory guide, you should remember that this is not enough!
- *\LaTeX for Word Processor Users* – This document explains how \LaTeX performs the common tasks and features of word processors.
- *\TeX FAQ* – The official \TeX FAQ. You can find it here (<http://tex.loria.fr/english/general.html>).
- *A Guide to \LaTeX* by Helmut Kopka & Matrick W. Daly – The best \LaTeX guide book for beginners and advanced users.

8 Note

There are some more useful documents in my web page (<http://www.geocities.com/kijoo2000/>). Some of them are:

- How to Create PDF from \LaTeX ([latex2pdf.pdf](#)) describes how to create high quality PDF files from \LaTeX sources. Also contains lots of valuable tips.
- A Bib \TeX Guide via Examples ([bibtex_guide.pdf](#)): This document describes how to (i) modify citation styles in your body text, (ii) make your own bibliography style (.bst) file, and (iii) modify the bibliography style file.

If you find any errors or have suggestions, please contact me at `kijoo2000` at yahoo dot com.